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The relationship between spiritual experiences, transpersonal trust, social support, and sense of coherence and mental distress—a comparison of spiritually practising and non-practising samples

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We compared the pathways from exceptional experiences (measured with the Exceptional Experiences Questionnaire, EEQ), transpersonal trust (TPV), social support (F-SoZu) and sense of coherence (SOC) scales towards mental distress within a spiritually practising (SP) and a non-practising sample (NSP), using structural equation modelling. We found a high amount of variance explained for SOC (SP: $R^2 = 0.50$; NSP: $R^2 = 0.61$), a moderate amount for F-SoZU (SP: $R^2 = 0.17$; NSP: $R^2 = 0.20$) and for TPV a very small amount only in the SP sample (SP: $R^2 = 0.04$; NSP: $R^2 = 0.00$). In contrast, for the EEQ, which grasps positive and negative spiritual, psychopathological, and visionary dream experiences, a strong relationship was found for the NSP sample ($R^2 = 0.53$) but only a moderate relationship for the SP sample ($R^2 = 0.28$). Further analysis revealed that the path coefficients from positive, negative spiritual, and psychopathological experiences to distress were significantly lower in the SP sample. Thus, as regular spiritual practice seems to alter the pathways to distress derived from positive and negative spiritual and psychopathological experiences, unidimensional questionnaires only grasping positive spiritual experiences seem to be inappropriate for explaining the intrapersonal mechanisms associated with regular spiritual practice.

[The] unseen region in question is not merely ideal, for it produces effects in this world. When we commune with it, work is actually done upon our finite personality, for we are turned into new men, and consequences in the way of conduct follow in the natural world upon our regenerative charge. But that which produces effects within another reality must be termed a reality itself, so I feel as if we had no philosophical excuse for calling the unseen or mystical world unreal. (James, 1904, p. 516)

Introduction

The relationship between spirituality, religion, and health has become a focus of interest within mainstream health psychology and psychiatry (Culliford, 2002; Miller

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& Thoresen, 2003). There is meanwhile a bulk of empirical evidence highlighting the importance of spiritual practice for mental health (Koenig, McCullough, & Larson, 2001; Weaver & Koenig, 2006), and in a similar line, a robust body of empirical research demonstrates the positive effects of mind–body practices, which are frequently associated within or practised as part of a spiritual belief system, for well-being and health (Walach, Gander, & Kohls, in press).

Uncertainty about the pathways from spirituality to health

There is, however, considerable uncertainty about the mechanisms that drive the spirituality–health connection. It has for example frequently been hypothesized that it is mainly the social component of religion and spirituality mediating beneficial effects (Levin, Chatters, Ellison, & Taylor, 1996; Powell, Shahabi, & Thoresen, 2003). Although this is certainly true for some types of religiosity, the appropriateness of this explanation for elucidating the intrapersonal effects of introspective techniques that are associated with spirituality may be debated. To give one example, one of the best studied introspective techniques is mindfulness-based meditation, which has its roots in an ancient Buddhist meditation practice. Nevertheless, Mindfulness-Based Stress Reduction (MBSR) Programmes have been developed in a medical context and are taught in a non-religious way. Mindfulness can be understood in psychological terms as a mental ability that allows one to focus on the direct and immediate perception of the present moment with a state of non-judgemental awareness, while evaluative cognitive feedback is voluntarily suspended (Hayes & Shenk, 2004). The focus of contemporary MBSR trainings is on integrating mindfulness into the realities of daily living, and participants are correspondingly encouraged to practise at home on a regular basis. This approach has in sum proven to be beneficial for health and well-being (Grossman, Schmidt, Niemann, & Walach, 2004; Reibel, Greeson, Brainard, & Rosenzweig, 2001). A recent FMRT study for example has found that individuals taking part in a MBSR Programme seem to be able to alter their personal psychological model so they can dissociate their self-awareness of the present from their long-term "self image" (Farb et al., 2007), which could possibly change the way they perceive suffering and distress. Thus, there is good reason to assume that the effects stemming from this or other forms of mediation cannot be merely explained as consequences of interpersonal or social factors, and to completely elucidate them one has to take intrapersonal factors into account as well.

Disentangling different layers of spirituality

Spirituality is a complex and multifaceted phenomenon that can correspondingly be defined in different ways and on many levels. For example, a recent meta-analysis investigating the relationship of spirituality and quality of life in 62 primary effect sizes from 51 high-quality studies found that differences in how the concepts of spirituality and quality of life were operationalized accounted for 27% of the variance in the respective primary effect size criterion (Sawatzky, Ratner, & Chiu, 2005). This is a clear sign that there are conceptual divergences in the operationalization of measures that that may hamper progress in the field.

Although most questionnaires measuring spiritual and religious domains have been devised on the basis of a Western (Christian) worldview, they are frequently inconsistent

from a conceptual standpoint (Edwards, 2003). Often items addressing spiritual and religious beliefs are lumped together with statements of faith and reports on behaviour, and both are sometimes mixed with descriptions of spiritual experiences (Hill & Pargament, 2003; MacDonald, LeClair, Holland, Alter, & Friedman, 2002). Meanwhile, there is consensus among researchers in the field that further research endeavours should try to disentangle different layers of concepts (Devon, 2005; Thoresen, 1999; Thoresen & Harris, 2002), and some authors have thereby explicitly argued for the need for new instruments assessing spiritual and religious *experience* instead of faith beliefs or attitudes (George, Larson, Koenig, & McCullough, 2000). There is indeed good reason to assume that spiritual practice and experiences arising from regular exercise, rather than belief sets, attitudes, or behaviour, might be pivotal to revealing the pathways from spirituality to health: First of all, spiritual experiences as they are reported in the mystical traditions are arguably at the roots of religion.[1] Second, conversion phenomena that sometimes change the whole trajectory of the life of the respective individuals are based on extraordinary experiences, interpreted as important divine messages, such as revelations, apparitions, or miracles. Third, within religious and spiritual systems, meditative or contemplative practices have been systematically developed in the course of time as venues for experiencing altered states of consciousness, which are frequently associated with spiritual or mystical experiences. Correspondingly, spiritual practice may be understood as any regular activity intended and designed to elicit spiritual experiences, e.g., prayer, meditation or forms of contemplation.

Own empirical research approach

We believe that an important step towards disentangling the pathways from spirituality to health is the distinction between direct intrapersonal effects stemming from exceptional and spiritual *experiences* as opposed to religious and spiritual *beliefs* or *religious behaviour*. However, we also hold the opinion that the tendency to devise measurement instruments for grasping spiritual experiences as unidimensional and mainly positive constructs—such as the Daily Spiritual Experiences Scale (Underwood, 2006; Underwood & Teresi, 2002)—is insufficient for scrutinizing the intrapersonal effects of spiritual practice. We believe in contrast that it is important to differentiate between positive and negative spiritual experiences, because it is by no means clear that spiritual experiences are predominantly positive. This is witnessed by the fact that many individuals reporting spiritual experiences were actually temporarily suffering distress from their exceptional experiences (Smucker, 1996).

Hence, we have devised, pilot-tested, cross-validated, and revised a multidimensional instrument called the Exceptional Experiences Questionnaire (EEQ) for assessing the frequency and the emotional components of exceptional and spiritual experiences as opposed to faith and belief statements, which has been described in detail elsewhere (Kohls, 2004; Kohls, Hack, & Walach, 2008; Kohls & Walach, 2006). In short, the EEQ captures positive and potentially unfavourable spiritual experiences, psychopathological experiences, as well as visionary dream experiences (see Measures section for sample items). We could show that individuals with regular spiritual practice report both more positive and negative spiritual experiences. We could additionally show that a class of items describing psychopathological experiences of mainly delusionary character as well as visionary dream experiences can be psychometrically separated from positive and negative spiritual experiences.

For analysing the pathways from the four factors of the EEQ towards psychological distress, linear regression analysis was previously utilized (Kohls & Walach, 2007), comparing two sociodemographically balanced nonclinical subsamples of spiritually practising and non-practising individuals. Although spiritually practising individuals reported significantly more positive and negative spiritual experiences, they accounted for only 7% of psychological distress (as measured with the Brief-Symptom Inventory (BSI)) in the spiritually practising sample, but for 36% of distress in individuals with lack of spiritual practise. A comparison of the respective regression weights between spiritually practising and non-practising individuals revealed only a significant difference for the pathway from experiences of ego loss to psychological distress: Experiences of ego loss had no effect on psychological distress in the group of individuals with regular spiritual, contemplative, or meditative practice, while they exhibited significant impact on distress in individuals with lack of spiritual practice. In contrast, no significant contribution was found for positive spiritual experiences in both groups.

Based on these findings, we have suggested that spiritual practice could be considered to be a specific coping strategy for the distress caused by experiences of ego loss. Thus, our analysis suggested that instead of interpreting spiritual practice as a health resource, lack of spiritual practice should rather be regarded as a distinct risk factor. We have replicated this finding in a sample of chronically ill patients (Kohls, Walach, & Lewith, submitted). In sum, our research findings are obviously in contrast with existing research, which shows that mainly positive spiritual experiences have a protective effect upon health (George et al., 2000). Our outcome rather suggests that a key mechanism of regular spiritual practice seems to be that a distressing impact of negative spiritual experiences can be annihilated or at least gradually suspended.

Open questions and structural equation modelling

Empirical research shows that positive spiritual experiences have only a low or moderate impact on well-being (Underwood & Teresi, 2002). Thus, the question arises, whether our finding is a new insight that was made possible through the multidimensional design of the EEQ, which takes both positive and negative spiritual experiences into account. Alternatively, this result may also—at least partly—be a methodological artefact, because linear regression analysis, which we have used (Kohls & Walach, 2007), does not account for intercorrelations between predictor variables. However, the four subfactors of the EEQ are naturally intercorrelated (Kohls, 2004; Kohls & Walach, 2006). We therefore decided to reanalyse our full nonclinical data set by means of structural equation modelling (SEM). This analysis technique explicitly allows the definition and estimation of complex model structures by combining the approaches of factor and regression analysis with path analysis and by allowing interrcorrelations between predictor variables. Furthermore, if multiple indicator variables are present, theoretically derived constructs can be modelled by means of so-called latent or structural variables that possess desirable psychometric properties (Bollen, 1989). One of the advantages of latent variables is that the measurement error can be explicitly separated from the true variance. Thus, latent variables, in contrast to observed manifest indicators, do not suffer from systematic restrictions in measurement quality, given that certain criteria are met (Hair, Anderson, Tatham, & Black, 2004).

Scope of the paper

In this paper:

(1) in order to obtain indications for the intrapersonal mechanisms associated with regular spiritual practice, we analyse the predictive value of exceptional experiences on mental distress for individuals with a regular spiritual practice and individuals without such a practice, applying SEM;
(2) we investigate the amount of variance in mental distress explained by the EEQ with the respective amount explained by well-established constructs such as social support, sense of coherence, and transpersonal trust;
(3) we compare the pathways from exceptional experiences, social support, sense of coherence, and transpersonal trust to mental distress.

Method

Participants

We have tested both a sample of individuals with a regular spiritual practice (''spiritually practising'' [SP]; N = 350; 71% women) and individuals without such a practice (''non-practising'' [NSP] $N = 299$; 69% women). All samples are convenience samples, and more detailed demographics can be derived from Table 1.

In short, samples were comparable with regard to their mainly Christian denomination (Catholic: SP: 30%; NSP: 32%; Protestant: SP: 31%; NSP: 42%; no denomination: SP: 33%; NSP: 22%) and their high degree of education (university-entrance diploma SP: 78%; NSP: 81%). Individuals in the SP sample (mean age: SP: 44.9 years, $SD = 12.3$) were older than those in the NSP sample (mean age NSP: 34.1 years, $SD = 13.1$) by an average of almost 11 years. The difference in age is mainly due to the fact that in the NSP sample, many students were included, naturally also affecting the family status of this cohort (single: SP: 40%; NSP: 60%; married: SP: 43%; NSP: 29%; divorced: SP: 15%; NSP: 10%). In order to obtain two sociodemographically matched subsamples for analysing intersample differences, in previous analyses post-hoc controlling by means of propensity score matching was used (Kohls & Walach, 2007, 2008). However, in order to account for a sufficiently high sample size necessary for utilizing SEM, the full data set will be used in this analysis. This is warranted as a sensitivity analysis with our propensity-score matched sample and regression analysis has shown that the results between the full and the matched sample are comparable.

Procedures

The study was conducted at the University Hospital in Freiburg. Participants from Germany and Switzerland were recruited in public campaigns, university lectures and courses as well as in meetings, congregations and conferences, and also by word of mouth over a period of 2 years. For recruiting spiritually practising individuals, we additionally addressed individuals from spiritually interested groups like religious communities of Christian background, courses of Zen or Viapassana meditation and the German Spiritual Emergence Networks.

Participants were presented with a set of paper and pencil questionnaires twice within a 6-month interval. Return envelopes were paid in advance and addressed to ensure

Table 1. Sociodemographic data for subsamples.

	Spiritually practising	Spiritually non-practising
N	350	299
Sex		
Women	247 (71%)	206 (69%)
Men	103 (29%)	92 (31%)
Mean age	44.9 ($SD = 12.3$)	34.1 ($SD = 13.1$)
Family status		
Single	141 (40%)	178 (60%)
Married	149 (43%)	87 (29%)
Divorced	52 (15%)	29 (10%)
Widowed	7 (2%)	4 (1%)
Own children	170 (49%)	106 (36%)
Life situation		
Living alone	134 (38%)	81 (27%)
Living in parental home	5 (1%)	28 (10%)
Living with a partner	179 (51%)	124 (42%)
Flat share	32 (9%)	63 (21%)
Denomination		
Catholic	103 (30%)	96 (32%)
Protestant	110 (31%)	124 (42%)
Free Churches	8 (2%)	5 (1%)
Moslem	0 (0%)	1 (0%)
Jewish	0 (0%)	1 (0%)
Hindu	1 (0%)	0 (0%)
Buddhist	4 (1%)	1 (0%)
No denomination	116 (33%)	66 (22%)
Other	3 (1%)	6 (2%)
Education		
None	1 (0%)	0 (0%)
Still in school	1 (0%)	7 (2%)
Secondary school	16 (5%)	13 (4%)
Secondary modern school	52 (15%)	37 (13%)
University-entrance diploma	278 (78%)	240 (81%)
Qualification		
No formal qualification	5 (1%)	5 (2%)
Still qualifying	36 (10%)	130 (46%)
Apprenticeship	34 (10)%	30 (11%)
Vocational college	47 (14%)	20 (7%)
University diploma	224 (65%)	98 (35%)

Note: Figures in this table are rounded up to nearest whole if they are >0.5 and rounded down if <0.5; therefore, the cumulated percentage may differ slightly from 100%. Missing data are not included. Parts of this table are taken from Kohls, N., & Walach, H. (2006). Exceptional experiences and spiritual practice– a new measurement approach. *Spirituality and Health International*, 7(3), 125–150.

confidentiality. For the first survey, a total of 2000 questionnaires were disseminated and $N = 705$[2] replied, leading to a response rate of approximately 35%. After 6 months, the same questionnaire battery was distributed to those 642 participants who had given written consent for the follow-up study, and $N = 451$ replied, leading to a response rate of approximately 70% for the second survey. Additionally, interviews for determining inter-method validity were conducted with 35 selected individuals that are reported in detail elsewhere (Kohls, 2004; Kohls et al., 2008).

Spiritual practice was operationalized as regular practice of any one spiritual discipline such as meditation, prayer, contemplation, thai chi, or chi gong, or several kinds of yoga techniques. Subjects were assigned to the spiritually practising sample if they had answered the questions "Do you practise meditative or spiritual techniques on a regular basis?" in the positive. All individuals gave informed consent prior to the participation in the study.

Measures

Exceptional Experiences Questionnaire (EEQ)

This is a 25-item instrument developed by us for the measuring exceptional and spiritual experiences (Kohls, 2004; Kohls, Hack & Walach, 2008; Kohls & Walach, 2006). Every item of the EEQ describes a potential exceptional experience, and respondents are requested to consider both frequency and individual evaluation of these experiences as additional information. A principal-component factor analysis, which was based on the prevalence data, extracted four factors that explain 49% of the variance. The first factor contains positive spiritual experiences (item example: "I am illumined by divine light and divine strength"), the second factor describes experiences of ego loss and deconstruction (item example: "My world-view is falling apart"), the third factor includes psychopathological experiences (item example: "I clearly hear voices, which scold me and make fun of me, without any physical causation"), and the fourth factor is pertaining to visionary dreams (item example: "I dream so vividly that my dreams reverberate while I am awake"). The instrument shows adequate discriminant validity with Sense of Coherence, Social Support, as well as Mental Distress and in some aspects convergent validity with Transpersonal Trust. The analysis of first-order correlations between our questionnaire and other scales confirms the hypothesis that spiritual and psychopathological experiences represent different classes of experiences, and that they are separated by our questionnaire. The 25-item short form of the instrument shows good psychometric properties (range for Cronbach's alpha: $r = 0.67$–0.89, range for test–retest reliability after 6 months $r = 0.66$–0.87).

Transpersonal Trust Scale (TPV)

This is an 11-item scale with good psychometric properties measuring one dimension of trust in the processes of life, in some larger purpose of life or some higher being like God (Belschner, 2000, 2001). The scale has been gauged in a representative sample of the German population (Albani et al., 2003) and has been successfully used to predict improvement of therapy in a psychotherapeutic inpatient setting (Belschner, 2003). Two examples for representative items are "I feel connected with a higher reality/with a higher being/with God. Even in hard times I can trust this reality." and "Sometimes in my life I have the impression that I am led by a higher insight."

Sense of Coherence (SOC 13)

This is a concept originally introduced by Antonovsky to describe whether a person finds their environment and life circumstances understandable, manageable, and predictable (Antonovsky, 1993; Langius, Björvell, & Antonovsky, 1992). Within health psychology, SOC is regarded as an important source of resistance against and resilience towards

various stressors and frustrations in life. Sense of coherence has frequently been associated with spirituality or has been used as a measure for gauging spirituality (Delgado, 2007). For the sake of parsimony, we used the newly constructed, validated, and gauged German short-form version with 13 items (Schumacher, Gunzelmann, & Brähler, 2000; Schumacher, Wilz, Gunzelmann, & Brähler, 2000). Two examples for representative items are "Do you have the feeling that you are being treated unfairly?" and "Until now your life has had: Scale: 1 = no clear goals or purpose and 7 = very clear goals and purpose."

Social Support (F-SoZu)

Social Support is one of the most important constructs predicting health outcomes and quality of life in a variety of diseases (Barker & Pistrang, 2002; Hogan, Linden, & Najarian, 2002; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). We measured it using the 14-item short form of one of the most widely used German scales (Fydrich, Sommer, & Brähler, 2002). Two sample items are "There are people that stand by me both in good times and bad times" and "There are people who accept me without limitation."

Brief Symptom Inventory (BSI)

The 53-item short form of the Symptom Checklist (SCL 90) is one of the most widely used screening instruments to briefly assess psychological disturbances on nine subscales (Derogatis & Melisaratos, 1983). It uses a frequency rating of common symptoms of disturbances to assess whether psychiatrically relevant symptoms of distress are present. We used the newly developed abbreviated German version (BSI) which gives one Global Severity Index (GSI) of distress (Franke, 1995; Klaiberg, 2002).

Analytic plan

In this paper, data collected at the first point of measurement are analysed, and with regard to the EEQ only prevalence data have been used.[3] For describing differences between the spiritually practising and non-practising sample, we used SPSS 11.0 for calculating t-tests for independent samples ($p < 0.01$). For descriptive purposes, Cohen's d as a measure of effects size was also computed.

The SEM models were estimated with AMOS 4.01 software using the maximum likelihood minimization (Bollen, 1989). In order to allow for model estimation despite the presence of missing data within the data matrix, means and intercepts were modelled as elements of the covariance matrix. We assessed the model fit using the ratio of chi-square value to degrees of freedom (CMINI/*df*), the Comparative Fit Indices (CFI), the Tucker–Lewis Index (TLI), and the root mean square error of approximation (RMSEA) (Kline, 2005). For the SEM analysis, no ad hoc changes, e.g., correlation of error terms to improve model fit, have been made.

Applying SEM, we determined four models to investigate the straightforward pathways from exceptional experiences, social support, sense of coherence, and transpersonal trust as exogenous variables to mental distress as measured by the BSI as endogenous variable. Each model was tested both for the spiritually practising SP and NSP. Thereby, each of the applied constructs has been operationalized as a latent variable as follows.

Exogenous variables

EEQ (multivariate model)

SEM analysis was based on the prevalence data, and we used all items of the 25-item version for estimating the latent factor construct. Hence, factors 1–3 are estimated by seven items, whereas factor 4 is estimated by four items. Intercorrelations between all four latent factor constructs were also permitted in the SEM model in order to accommodate correlations between the four factors found in the PCA analysis (Kohls, 2004; Kohls & Walach, 2006).

TPV, SOC, F-SoZu (univariate models)

As all constructs were operationalized as one-dimensional concepts by the short scales, we used all respective items of the scale for estimating the respective latent construct variable, i.e., 11 items for transpersonal trust, 13 for sense of coherence, and 14 for social support.

Endogenous variable

BSI: We calculated the means for the nine subscales of the BSI and used them as a basis for estimating the Global Severity Index (GSI) as a latent variable.

Testing for moderating effects

In order to test for moderating effects of regular spiritual practice, relevant pathways from the four factors of the EEQ towards psychological distress were tested by a multigroup-comparison approach. With this approach, we tested whether group-invariant parameter constraints on the unstandardized b-regression weights result in a significant decrease in model-fit, thus indicating group-specific parameter values (Arbuckle & Wothke, 2003; Bollen, 1989; Homburg & Giering, 2001; Kline, 2005). In the Results section, both the standardized beta regression weight and the unstandardized b-coefficients are reported. To allow for the interpretation of absolute effect sizes and for the sake of graphicness, in Figures 1 and 2 only the standardized beta coefficients have been reported.

Results

Mean differences in sample characteristics

Table 2 depicts the mean characteristics for the SP and the NSP sample for the EEQ-25, TPV-11, SOC-13, FSoZu-14, and the BSI-53 as well as results from an independent samples t-test and effect sizes using Cohen's d.

With regard to the EEQ, the SP sample reports both more spiritual experiences (factor 1) and more experiences of ego loss/deconstruction (factor 2) as well as visionary dream events (factor 4) than the NSP group. There is also a significant interdifference for transpersonal trust. In sum, both the EEQ and the TPV can discriminate between spiritual practising and non-practising individuals, whereas SOC-13, F-SoZu, and BSI-53 cannot make this distinction (Kohls, 2004; Kohls & Walach, 2006).

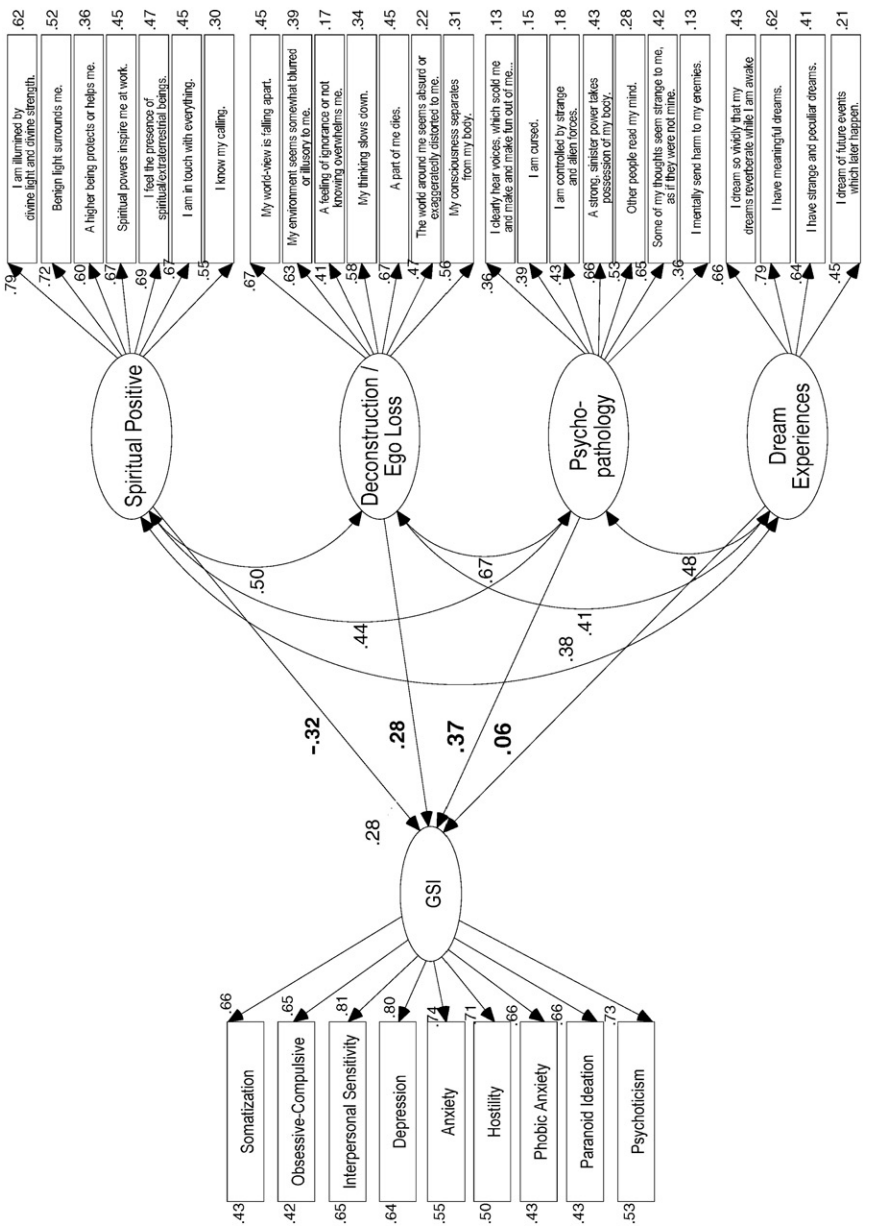

Figure 1. SEM analysis for SP sample modelling pathways from exceptional experiences to mental distress. Note: Rectangles indicate observed indicator variables for the EEQ and computed subscales for the BSI. Ovals indicate unobserved latent variables. Numbers printed in bold next to the single-headed arrows indicate standardized regression weights (for unstandardized *b*-regression weights, see Table 3), and numbers next to the double-headed arrows indicate intercorrelations between the factors of the EEQ. Numbers at the upper right corner next to rectangles indicate squared multiple correlation coefficients.

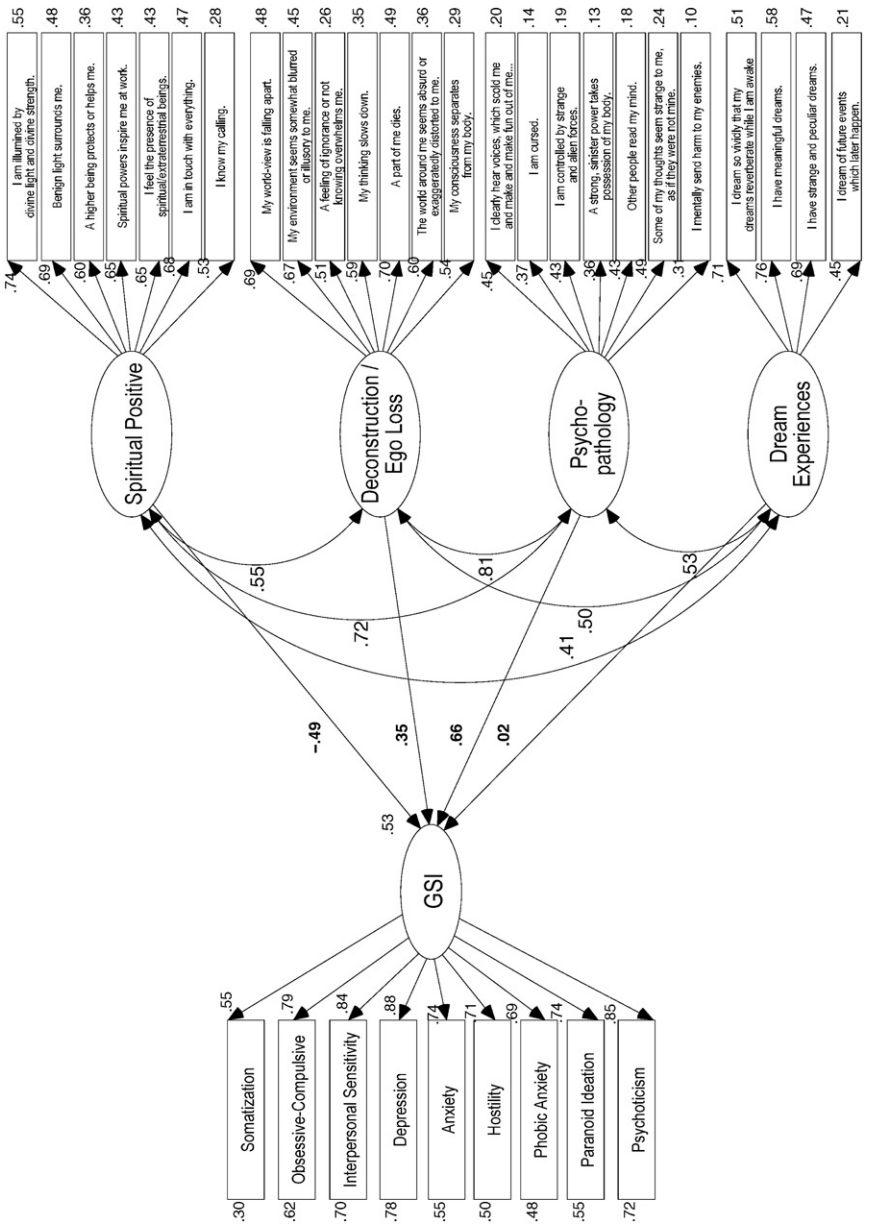

Figure 2. SEM analysis for NSP sample modelling pathways from exceptional experiences to mental distress. Note: see Figure 1.

Table 2. Mean characteristics for the spiritually practising and spiritually non-practising sample.

		Spiritually practising ($N = 350$)		Spiritually non-practising ($N = 299$)			
Characteristic	Range	*M*	*SD*	*M*	*SD*	*p* (independent samples *t*-test)	Cohens' *d*
EEQ: Prevalence Positive Spiritual Experiences	0 (low) – 4 (high)	1.75	0.85	0.83	0.72	<0.01	1.08
EEQ: Prevalence Loss of Ego/Deconstruction	0 (low) – 4 (high)	1.22	0.66	0.81	0.61	<0.01	0.62
EEQ: Prevalence Psychopathology	0 (low) – 4 (high)	0.30	0.35	0.24	0.30	<0.05	0.17
EEQ: Prevalence Visionary Dreams	0 (low) – 4 (high)	1.44	0.66	1.26	0.74	<0.01	0.24
TPV: Transpersonal Trust	1 (low) – 5 (high)	4.23	0.70	3.03	1.01	<0.01	1.19
F-SoZu: Social Support	1 (low) – 5 (high)	4.38	0.60	4.43	0.60	0.33	–0.08
SOC: Sense of Coherence	1 (low) – 7 (high)	4.90	0.78	4.79	0.85	0.09	0.13
BSI: Mental Distress	0 (low) – 4 (high)	0.52	0.38	0.53	0.44	0.70	–0.02

Notes: Parts of this table are taken from Kohls, N., & Walach, H. (2006). Exceptional experiences and spiritual practice—a new measurement approach. *Spirituality and Health International*, 7(3), 125–150.

SEM analysis for modelling pathways from exceptional experiences on mental distress

In a first step, the pathways from the four factors of the EEQ to mental distress (GSI) were investigated. Figures 1 and 2 depict the SEM model for the SP and the NSP sample analysing pathways from the four factors of the EEQ on the GSI.

The overall fit for the model was satisfactory for both samples. Although chi-square values indicate significant differences between the observed and model implied covariance matrix (χ^2 [1034 *df*] = 2103.058; $p < 0.001$), according to the measures of approximate fit (CMIN/*df* = 2.034; CFI = 0.953, TLI = 0.946, RMSEA = 0.040) a sufficiently close approximation of empirical associations is achieved by the model (Hair et al., 2004; Kline, 2005).

While the four factors of the EEQ explained 53% of variance in psychological distress as measured by the GSI for the NSP sample, the respective amount explained for the SP sample was only 28%.

SEM analysis for modelling pathways from transpersonal trust, social support, and sense of coherence on mental distress

Similar to the SEM models depicted in Figures 1 and 2, we also calculated SEM models analysing unidimensional pathways from transpersonal trust, social support, and sense of coherence on the GSI for each sample separately. The results as well as the fit indices are depicted in Table 3 for both the SP and NSP sample.

The overall index fits for all three models, which were not trimmed for a better fit, were moderate for both samples but can still be regarded as satisfactory. The sense of coherence is able to explain the highest amount of variance in the GSI (SP: $R^2 = 0.50$; NSP: $R^2 = 0.61$) followed by social support (SP: $R^2 = 0.17$; NSP: $R^2 = 0.20$). In contrast, there are no crucial pathways from transpersonal trust to the GSI (SP: $R^2 = 0.04$; NSP: $R^2 = 0.00$).

Testing moderating effects of regular spiritual practice vs. lack on practice on structural path coefficients

A more detailed analysis of the SEM model focusing on the structural path coefficients reveals that for both samples a *negative* structural path coefficient points from the positive spiritual experiences factor towards the GSI (SP: $\beta_1 = -0.32$; $b_1 = -0.11$; $p < 0.001$; NSP: $\beta_1 = -0.49$; $b_1 = -0.31$; $p < 0.001$) as opposed to the remaining three factors. The two *positive* structural path coefficients concerning ego loss and psychopathology are also smaller within the SP sample (deconstruction/ego loss for SP: $\beta_2 = 0.28$; $b_2 = 0.11$; $p = 0.006$; NSP: $\beta_2 = 0.35$; $b_2 = 0.21$; $p = 0.056$; psychopathology: SP: $\beta_3 = 0.37$, $b_3 = 1.21$; $p = 0.002$; NSP: $\beta_3 = 0.66$; $b_3 = 2.19$; $p = 0.023$). Only the path coefficient pertaining to visionary dream experiences is, although generally speaking weak, larger within the SP sample (SP: $\beta_4 = 0.06$; $b_4 = 0.03$; $p = 0.394$; NSP: $\beta_4 = 0.02$; $b_4 = 0.01$; $p = 0.78$).

Moderating effects of regular spiritual practice on the pathways from exceptional experiences on psychological distress were to be expected, because spiritual practice can be understood as a means for facilitating spiritual experiences. A visual ad hoc comparison of the two SEM models also suggests that the influential pathways made up by positive spiritual experiences, experiences of ego loss/deconstruction and psychopathological experiences are distinctly buffered within the SP sample. As potential moderating effects may help in understanding the intrapersonal mechanisms associated with regular spiritual

Table 3. Summary for SEM models analysing pathways to mental distress (GSI) for transpersonal trust, social support and sense of coherence.

SEM for	Model fit indices (general model)	Spiritually practising ($N = 350$) Variance explained (R^2)/ (standardized/unstandardized path coefficient to GSI)	Spiritually non-practising ($N = 299$) Variance explained (R^2)/ (standardized unstandardized path coefficient to GSI)	Chi-square difference if path coefficient(s) imposed as equal
Exceptional Experiences (EEQ)	Chi-square [1034 df] = 2103.058, $p < 0.001$, CMIN/df = 2.034; CFI = 0.953, TLI = 0.946, RMSEA = 0.040	$R^2 = 0.28$	$R^2 = 0.53$	
Equality Constraints for				
Positive Spiritual Experiences (1)		$\beta_1 = -0.32$ ($b_1 = -0.110$; $p < 0.001$)	$\beta_1 = -0.49$ ($b_1 = -0.314$; $p < 0.001$)	6.973 [$\Delta df = 1$]; $p = 0.008$**
Deconstruction/Ego Loss (2)		$\beta_2 = 0.28$ ($b_2 = 0.108$; $p = 0.006$)	$\beta_2 = 0.35$ ($b_2 = 0.213$; $p = 0.056$)	0.545 [$\Delta df = 1$]; $p = 0.460$
Psychopathology (3)		$\beta_3 = 0.37$ ($b_3 = 1.21$; $p = 0.002$)	$\beta_3 = 0.66$ ($b_3 = 2.19$; $p = 0.023$)	1.058 [$\Delta df = 1$]; $p = 0.304$
Visionary Dreams (4)		$\beta_4 = 0.06$ ($b_4 = 0.028$; $p = 0.394$)	$\beta_4 = 0.02$ ($b_4 = 0.013$; $p = 0.780$)	0.077 [$\Delta df = 1$]; $p = 0.078$
All factors (1–4)				12,342 [$\Delta df = 4$]; $p = 0.015$*
Factors 1–3				12,287 [$\Delta df = 3$]; $p = 0.006$**
Factors 2 and 3				7,241 [$\Delta df = 2$]; $p = 0.027$*
Transpersonal Trust (TPV)	Chi-square [338 df] = 1002.106, $p < 0.001$, CMIN/df = 2.965; CFI = 0.972, TLI = 0.965, RMSEA = 0.055	$R^2 = 0.04$ $\beta = -0.21$; $b = -0.079$; $p < 0.001$	$R^2 = 0.00$ $\beta = 0.02$; $b = 0.005$; $p = 0.717$	
Equality Constraint				10.738 [$\Delta df = 1$]; $p = 0.001$**
Social Support (F-SoZu)	Chi-square [458 df] = 1396.971 $p < 0.001$, CMIN/df = 3.042; CFI = 0.978, TLI = 0.973, RMSEA = 0.056	$R^2 = 0.17$ $\beta = -0.41$; $b = -0.415$; $p < 0.001$	$R^2 = 0.20$ $\beta = -0.45$, $b = -0.250$; $p < 0.001$	
Equality Constraint				3.896 [$\Delta df = 1$]; $p = 0.048$*
Sense of Coherence (SOC)	Chi-square [482 df] = 1549.485 $p < 0.001$, CMIN/df = 3.215; CFI = 0.965, TLI = 0.963, RMSEA = 0.060	$R^2 = 0.50$ $\beta = -0.71$; b = 0.724; $p = 0.001$	$R^2 = 0.61$ $\beta = -0.78$; b = 0.903; $p = 0.001$	
Equality Constraint				6.295 [$\Delta df = 1$]; $p = 0.012$*

**Chi-square difference significant at the 1% level; *chi-square difference significant at the 5% level.

practice, in a next step, differences between the two samples in the structural path coefficients pointing towards GSI were tested for significance for every factor of the exceptional experiences scale as well as the transpersonal trust, social support, and sense of coherence scale.[4] The results can be found in the far right column in Table 3. With regard to the EEQ, upon constraining the four path coefficients for all four factors to be equal, we found a significant difference at the $p = 0.05$ level ($\Delta\chi^2 = 12{,}342$ [$\Delta df = 4$]; $p = 0.015$). When neglecting factor 4 as a result of the small regression weight (critical ratio of the maximum likelihood estimation for both samples $< \pm 1.96$) and only constraining factors 1–3 as equal, the respective chi-square difference test is significant at $p = 0.01$ ($\Delta\chi^2 = 12.287$ [$\Delta df = 3$]; $p = 0.006$). However, when constraining only one single factor, the chi square difference test is significant only for the positive spiritual experiences factor ($\Delta\chi^2 = 6.973$ [$\Delta df = 1$]; $p = 0.008$), while it becomes non-significant for the experiences of ego loss ($\Delta\chi^2 = 0.545$ [$\Delta df = 1$]; $p = 0.460$) as well as the psychopathology factor ($\Delta\chi^2 = 1.058$ [$\Delta df = 1$]; $p = 0.304$). This is probably due to the high intercorrelation between these two factors (SP: $r_{23} = 0.67$; NSP: $r_{23} = 0.81$), because if equality constraints are imposed on the structural path coefficients for the two respective factors, the chi-square difference test becomes significant ($\Delta\chi^2 = 7{,}241$ [$\Delta df = 2$]; $p = 0.027$).

Additionally, when analysing the three unidimensional constructs, we found significant differences only for transpersonal trust at the $p = 0.01$ level ($\Delta\chi^2 = 10.738$ [$\Delta df = 1$]; $p = 0.001$). However, this finding is negligible from a practical point of view, as the respective path coefficient is not significant for the NSP sample. Moreover, the structural path coefficient from social support ($\Delta\chi^2 = 3.896$ [$\Delta df = 1$]; $p = 0.048$) as well as sense of coherence ($\Delta\chi^2 = 6.295$ [$\Delta df = 1$]; $p = 0.012$) showed only a significant difference at the $p = 0.05$ level.

Discussion

In this paper, we have presented an alternative way of analysing the pathways from exceptional experiences, transpersonal trust, social support, and sense of coherence on psychological distress harnessing the advantages of SEM. Additionally, the amount of variance explained in distress was compared with the well-established constructs social support, sense of coherence, and transpersonal trust.

We have previously published a conventional analysis based on a linear regression analysis, where we have compared two sociodemographically balanced subsamples of spiritually practising and non-practising individuals (Kohls & Walach, 2007). In sum, the results from the SEM analysis presented in this paper corroborate the previous findings achieved by linear regression analysis. However, the SEM also revealed interesting new details that are missed by the classical approach:

(1) First, the overall amount of variance in psychological distress explained by the four factors of the EEQ was higher in the SEM analysis: Whereas the conventional linear regression analysis was able to explain 7% or 36% of the variance in distress in the samples with and without spiritual practice, the respective amount of variance explained by the SEM model was 28% and 53%. The larger amount of variance explained in the SEM model is most likely due to the fact that latent variables were used in the model, which allow one to explicitly take the measurement error into account. While the *total* amount of variance explained differs considerably between the SEM and the linear regression analysis, the *difference* in the amount of variance explained between the two samples is

comparable: it is 29% in the linear regression analysis and 25% in the SEM analysis. This is a clear sign that the intersample difference in the amount of variance explained in distress cannot be attributed to a methodological artefact; it shows rather that regular spiritual practice moderates the pathways from spiritual experiences to health.

(2) Second, the structural path coefficients of the SEM analysis differed from those found in the linear regression analysis. It is necessary to take a closer look: When the SEM analysis was independently computed with equality constraints sequentially imposed[4] on every factor of the EEQ, a significant intersample difference was only found for the positive spiritual experiences factor. Interestingly, the negative regression weight pointing from positive spiritual experiences towards distress was higher in the spiritually non-practising sample, thereby indicating that individuals without spiritual practice benefit more from positive spiritual experiences. In contrast, the linear regression analysis suggested a significant difference in the regression weights for negative spiritual experiences. Here, the beta weight of experiences of ego loss predicting psychological distress was not significant in the subsample of spiritually practising individuals, whereas it was highly significant in the sample with lack of spiritual practice. However, when equality constraints were imposed on both the negative spiritual experiences factor and the psychopathology factor, a significant difference in the model fit was also found in the SEM analysis. This is probably a consequence of high intercorrelations between the EEQ ego loss and psychopathology factor of $r = 0.81$ in the NSP and $r = 0.67$ in the SP sample (Figures 1 and 2), which is explicitly accounted for in our SEM model. This very likely allows the algorithm to distribute and compensate variance across both pathways, if inequality constraints[4] are imposed on only one pathway. Thus, this finding is very likely a consequence of accounting for intercorrelations between the predictor variables, which were—in contrast to the linear regression analysis—explicitly modelled in our SEM analysis.

(3) It is additionally important to recall that the linear regression analysis was based on a subset of sociodemographically matched subsamples (Kohls & Walach, 2007), whereas the SEM analysis was based on the full sample. However, the overall findings seem to be comparable, although the results of the SEM analysis are more sophisticated, because they explicitly allow testing for differences in pathways. Specifically, although regular spiritual practice seems to increase both the frequency of positive and negative spiritual experiences, through SEM analysis, it has become clear that spiritual practice apparently buffers the impact of a distinct subset of exceptional experiences comprising positive and negative spiritual as well as psychopathological experiences.

Taken together, the findings found in the SEM analysis give a much clearer and more differentiated picture about the intrapersonal effects of spiritual practice than the conventional regression analysis. We nevertheless acknowledge the fact that the two samples used in the present analysis could not be matched for sociodemographic variables, because the matching procedure that we have employed for the regression analysis was only able to provide 100 (Kohls & Walach, 2007) or 120 (Kohls & Walach, 2008) well-matched cases and discards the rest, which is not a number high enough for running an SEM analysis. Thus, it would be desirable for future projects to collect enough data so that post-hoc controlling procedures can be combined with SEM. This would necessitate a

sample larger by a factor of 3, i.e., around 1800–2000 cases. Nevertheless, we believe that the SEM analysis has provided more useful insights than the conventional regression analysis: First of all, the comparison of the path coefficients between the two samples suggests that both the stress-annihilating impact of positive spiritual experiences and the stress-augmenting impact of negative spiritual and psychopathological experiences are reduced by regular spiritual practice. Thus, the SEM analysis seems to reveal a paradoxical finding at first glance: Both the stress-annihilating impact of positive spiritual experiences and the stress-inducing effect of experiences of ego loss and psychopathological experiences are buffered by regular spiritual practice. Correspondingly, one could be inclined to assume that the double-barrelled effects of regular spiritual practice on psychological distress are in sum self-annihilating, as both positive and negative impact is diminished by regular spiritual practice. However, individuals with a lack of spiritual practice seem to suffer much more distress from negative spiritual and psychopathological experiences than individuals with regular spiritual practice. This could be a hint that some experiences—like ''losing oneself'', ''losing one's coherent picture of the world,'' etc.—that are indicative of cognitive deconstruction, when hitting the individual unprepared, can be detrimental, while they can be viewed and reframed in a more positive manner when met within a spiritual context. From a psychological perspective, while altering the self concept in a less ego-centred way, many spiritual techniques seem to buffer the impact of negative spiritual experiences on mental distress by a gradually suspending negative impact of deconstruction and even psychopathological experiences. The flip side of this process is that the stress-reducing impact of positive spiritual experiences is also partially diminished. However, in sum, the reduced distress annihilating impact of positive spiritual experiences by no means outweighs the resilience against distress as it is derived from experiences of ego loss.

Thus, in order to get the full picture of the intrapersonal mechanism of spiritual practice, it is necessary to scrutinize the impact on distress of positive *and* negative spiritual experiences. By taking only positive spiritual experiences into account, one might actually find misleading if not contradictory results: if a key psychological function of regular spiritual practice seems to be the ability to integrate exceptional experiences and thereby particularly deconstructive experiences into the self model more easily, how can the finding that the stress annihilating impact of positive spiritual experiences is lower in samples with spiritual practice be properly explained? This finding alone seems at first glance not only illogical but also completely counterintuitive at second thought. In order to make sense out of it, one needs also to scrutinize the pathways from experiences of ego loss and distress in a complementary way in order to fully grasp the mechanism apparently associated with regular spiritual practice that annihilates stress: Regular spiritual practice buffers the impact of positive and negative spiritual experiences on health.

It is noteworthy that one-dimensional scales that grasp only positive spiritual experiences—such as the Daily-Spiritual-Experiences Scale—have only found low correlations with health-related parameters (Underwood, 2006; Underwood & Teresi, 2002). However, based on our findings, the assumption that only positive spiritual experiences have beneficial effects on health would appear to be incorrect. These suppositions may have occurred because many of the instruments used to measure spiritual experience are unidimensional and so only appear to record positive experiences and their impact on health. Thus, one should be wary of promoting only positive spiritual experience as a route to well-being. Instead, for gauging the impact of spiritual experiences on health, it seems to be helpful to assess both positive and negative spiritual experiences as well as their impact upon distress.

The distress annihilating impact of regular spiritual practice seems thereby to be an important mechanism for maintaining health and well-being that should not be neglected. Comparing the amount of variance explained in distress by our multivariate model with the three external unidimensional constructs, a relative assessment of the impact of exceptional experiences and the moderating role of regular spiritual practice is possible: First of all, it becomes clear that only sense of coherence was able to explain more variance (61%) in mental distress for the spiritually non-practising sample. Recall that sense of coherence has been conceptually criticized for inversely assessing anxiety and depression (Geyer, 1997). Hence, it might simply be a redundant operationalization of distress. Additionally, for transpersonal trust and social support, although statistically significant, no comparable differences were found in the amount of variance explained between the two samples. In direct comparison with the respective model for social support, our multivariate model predicting the impact of exceptional and spiritual experiences on mental distress is able to explain about two and a half times as much variance as social support for the spiritually non-practising sample. In contrast, within the spiritually practising sample, the amount of variance in mental distress explained by exceptional and spiritual experiences is comparable to social support. Interestingly, the reliable and valid questionnaire measuring transpersonal trust does not explain any variance in psychological distress, although it has the highest effects concerning differences in mean for the two samples with regard to both effect size and difference in structural path coefficients.

Both sense of coherence (Larsson & Kallenberg, 1996; Richardson & Ratner, 2005) and social support (Barker & Pistrang, 2002; Hogan et al., 2002; Uchino et al., 1996) are among the best-studied constructs of health psychology and are widely accepted for their importance, mostly for the management of chronic diseases. However, although social support and sense of coherence are able to differentiate between a spiritually practising and a non-practising sample, the difference in the amount of variance explained in mental distress is much higher for the exceptional experiences scale. Hence, fostering spiritual practice could be even more promising as a preventive or therapeutic intervention, than, for instance, improving social support. Clearly, this possibility ought to be studied more widely.

The effect of spiritual practice, annihilating distress, which we discovered, might be due to psychological habituation or moderated by the psychophysiological effects of the experiences themselves. It does not seem to be due to a particular faith, belief, cognitive framework, or world view, although Transpersonal Trust, a construct measuring such a framework, did in fact show differential effects in the pathways to mental distress between our two subsamples. However, it did not explain a large amount of variance in mental distress. Hence, our results cannot be used to argue for or against any belief system, cognitive system, or creed. They rather open a new venue of research: the impact, effect, and nature of positive and negative spiritual experiences and the moderating role of spiritual practice.

Our findings imply three possibly interrelated, interpretations: First, persons with spiritual practice seem to be able to make more sense of their spiritual experiences. Thus, experiences are more easily integrated and accepted, which possibly buffers their effect on mental health in both directions (positive and negative). Second, within the spiritually practising sample, the influence on distress of negative exceptional experiences (experiences of ego loss and psychopathological symptoms) is smaller. If experiences of ego loss are less correlated with psychological distress, then reduced psychological distress will possibly reduce the presence and impact of psychopathological experiences and hence reduce the impact of the full model on psychological distress as a consequence. Thus, even

the lower explanatory power of the model for the spiritual sample is indirect evidence for the importance of spiritual experiences for psychological health, and spiritual practice seems to be a key factor.

Third, it seems to be experiences that are supportive, not attitudes or beliefs. That assumption was already proposed by William James (1904). It is consistent with recent findings that analysed the impact of spirituality in cancer patients, which used a newly constructed scale, the FACIT-Spiritual Well-being Scale, and differentiated Meaning/Peace from Faith, the latter being a set of cognitive attitudes. While Meaning/Peace was predictive of quality of life, even after adjusting for other aspects of quality of life, and emotional aspects of the disease, the influence of Faith was smaller (Brady, Peterman, Fitchett, Mo, & Cella, 1999; McClain, Rosenfeld, & Breitbart, 2003).

Our study, although based on a sufficiently large sample to render most estimations of the models stable, has several limitations which should not be overlooked: First, we did not recruit a representative sample of the population and we did not utilize sample matching in order to sustain a sufficiently high sample size. The next step would be to validate the EEQ and replicate the results in a large representative population sample. In the same vein, it would be necessary to study clinical populations. Second, as we had to rely on the full sample set, we were naturally not able to control for parameters. Hence, although our data suggest a causal impact of spiritual experiences on mental health moderated by regular spiritual practice, for the time being our interpretation should be regarded as a hypothesis that needs to be replicated. To investigate the direct effects of spiritual practice on the frequency and evaluation of exceptional and spiritual experiences as well as their impact on psychological distress, controlled trials with baseline matching are necessary that introduce spiritual practice as a treatment variable.

We believe that the strengths of this study—the large sample size, the good psychometric properties of the instruments used, and the modelling of inter-correlations—outweigh weaknesses and allow us to draw valid, albeit tentative conclusions: Spiritual practice is an important protective factor for psychological health. Together with other aspects measured by our instrument, it explains 53% of the variance in psychological distress for spiritually non-practising individuals but only 28% for spiritually practising persons. Spiritual practice seems to be a buffer for positive but also disturbing spiritual experiences. It is time to study the ramifications of this finding more broadly, especially in clinical populations, chronically ill subjects, and the general population at large. If our findings are replicated, we have made a start in establishing a hitherto overlooked risk factor for well-being: lack of spiritual practice.

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Notes

1. Although it is widely accepted that spiritual experiences are completely dependent on social and religious context (Katz, 1992), these arguments do not seem to be in line with the phenomenology of at least some spiritual experiences (Hufford, 2005). We will assume in the following that at least some spiritual experiences can be seen as prior to and foundational of formal religions, and not necessarily following from religious doctrine.
2. We also collected data from a small clinical sample that is not reported in this paper, because it cannot be regarded as representative for clinical populations, mainly because it consisted of spiritually practising or at least spiritually interested individuals with mental disorders (see Kohls, 2004 and Kohls & Walach, 2006 for details).
3. We restrained from analysing the evaluation data of the EEQ, because N for evaluation data varies for each item depending on the item difficulty based on prevalence. This is because we have asked our participants to exclusively assess the evaluative component of an exceptional experience if they had personally encountered this experience (Kohls, 2004; Kohls & Walach, 2006).
4. We tested every path coefficient for significant intersample differences by defining a nested model where the respective path coefficient(s) is (are) restricted by equality constraints between the two subsamples. Correspondingly, the only difference between the nested and the general model is that the respective path coefficients are imposed to be equal for both samples in the nested model, whereas they are allowed to differ in the general model. Thus, technically speaking, the general model has one (or n) degree(s) of freedom more than the nested model, because one parameter has to be estimated instead of two (or n). Due to that fact, the chi-square value will always be higher for the nested model. The question is whether the difference in the chi-square value between the general and nested model is statistically significant. The model fits of the two models can be easily tested for significance by an overall chi-square difference test which is compared with a chi-square distribution with one (or n)degree(s) of freedom. For example, with regard to one degree of freedom difference the critical value for the difference in chi-square at the $p = 0.05$ level is 3.84 and at the $p = 0.001$ level is 6.63. However, only if the imposed constraints lead to a significant decrease in data fit as indicated by a significant difference of the chi-square test (Homburg & Giering, 2001), can the corresponding subgroup specific model components be considered important. A significant difference in the chi-square values can then be interpreted as an indicator for intersample differences in the respective structural path coefficient(s), where equality constraints have been imposed. We compared the nested model with the general model for each construct using both $p = 01$ and $p = 0.05$ levels.

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