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To cite this article: George Silberschatz & Katie Aafjes-van Doorn (2016): Pathogenic Beliefs Mediate the Relationship Between Perceived Negative Parenting and Psychopathology Symptoms, Journal of Aggression, Maltreatment & Trauma

To link to this article: <http://dx.doi.org/10.1080/10926771.2016.1259279>



Published online: 21 Dec 2016.



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Pathogenic Beliefs Mediate the Relationship Between Perceived Negative Parenting and Psychopathology Symptoms

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ABSTRACT

Negative parenting style, such as abuse, neglect, and intrusiveness, is significantly related to subsequent development of psychopathology. Here we sought to examine pathogenic beliefs as a potential mechanism of change. We explored whether pathogenic beliefs help explain the relationship between perceived negative parenting style and common psychopathology symptoms. This study assessed the psychometric properties of the self-report Pathogenic Beliefs Scale and tested its mediating effect on the relationship between negative parenting and psychopathology. A community sample of 732 adults completed an online survey that included measures of perceived negative parenting style (MOPS), pathogenic beliefs (PBS), and a transdiagnostic measure of common indicators of psychopathology (anxiety, low self-esteem, emotional instability, pessimistic attitude, and depression). Results showed that pathogenic beliefs were significantly associated with negative parenting experiences in childhood and adult psychopathology symptoms. Moreover, pathogenic beliefs mediated the relationship between negative parenting style and psychopathology. Implications for clinical practice are discussed.

ARTICLE HISTORY

Received 8 December 2015
Revised 3 June 2016
and 28 July 2016
Accepted 26 September 2016

KEYWORDS

adverse childhood experience; maltreatment; MOPS; parenting; pathogenic belief scale; psychopathology; trauma; vulnerability

Traumatic or adverse childhood experiences have long been thought to play a critical role in the development of psychopathology (e.g., Edwards, Holden, Anda, & Felitti, 2003; Sroufe, Egeland, Carlson, & Collins, 2009). A number of studies focusing on clinical samples have found that negative parenting styles (characterized by low caring, neglect, overprotection, intrusion, or abuse) are significant predictors of psychopathology, including depression, anxiety, substance abuse, and borderline personality disorders (Cloitre et al., 2009; MacIntosh, Godbout, & Dubash, 2015; Parker, 1979; Schimmenti & Bifulco, 2015; Silove, Parker, Hadzi-Pavlovic, Manicavasagar, & Blaszczyński, 1991; Torresani, Favaretto, & Zimmermann, 2000). Similar results have also been reported in nonclinical, community samples (e.g., Enns, Cox, & Clara, 2002; Godbout, Briere, Sabourin, & Lussier, 2014; Kerver, Son, & De Groot, 1992; Parker, Hadzi-Pavlovic, Greenwald, & Weissman, 1995) with replication studies

in non-Western samples (Sakado et al., 2000). Psychodynamic (e.g., Blatt, Wein, Chevron, & Quinlan, 1979) as well as cognitive (e.g., Beck, 1967) theorists propose that negative parenting styles increase the vulnerability to developing psychopathology in adulthood, and there is considerable empirical support for this proposal (Lizardi et al., 1995; Parker & Hadzi-Pavlovic, 1992; Zemore & Rinholm, 1989).

Theories on cognitive vulnerability

Although there is substantial research evidence suggesting that negative parenting styles experienced in childhood are significantly associated with long-term negative mental health consequences, the mechanisms responsible for this predictive relationship remain unknown. A number of theorists have postulated that beliefs, schemas, or internal working models explain how adverse experiences lead to psychopathology (e.g., Bowlby, 1988; Young, 1994), which has been supported by empirical research (e.g., Shah & Waller, 2000; Valiente, Romero, Hervas, & Espinosa, 2014).

The diathesis-stress model (Monroe & Cummins, 2015) seeks to explain how different people might respond differently to the same adverse experiences and suggests that people have, to different degrees, vulnerabilities or predispositions for developing psychopathology. Childhood adverse experiences can create vulnerabilities in our development and more vulnerable individuals are thus more likely to develop psychopathology when faced with adversity in adulthood.

People who have been exposed to early negative life events in childhood have a higher predisposition and are more likely to develop symptoms of depression or anxiety in adulthood. Both theory (Beck, Rush, Shaw, & Emery, 1979; Young, 1994) and empirical findings (e.g., Kenny, Moilanen, Lomax, & Brabeck, 1993; Parker, 1993) have implicated cognitive vulnerability as a particular diathesis for common psychopathology symptoms. Rose and Abramson (1992) proposed a developmental pathway by which negative events in childhood, particularly maltreatment, could contribute to the development of negative cognitive styles, which, in turn, increase individuals' vulnerability to developing hopelessness and depression. Young, integrating the work of Beck et al. and Bowlby (1988), proposed that specific early maladaptive achemas (EMSs) develop during childhood via interpersonal interactions and form a template that guides the interpretation of later experiences. Both Bowlby and Young argued that early interactions with caregivers, most notably parents, contribute to the development of cognitive schemas or internal working models early in life. Compared with other cognitive vulnerabilities, these schemas are considered to be more unconditional, automatic, and capable of engendering high levels of negative affect because they relate to core life themes such as

autonomy and intimacy (Schmidt, Joiner, Young, & Telch, 1995). Similar models of development of psychopathology are evident in concepts like “core beliefs” in cognitive behavioral therapy (Beck), “schemas” in schema therapy (Young), and “internalized working models” in attachment theory (Bowlby).

Control-mastery theory, an integrated cognitive-psychodynamic-relational theory of how psychopathology develops and how psychotherapy works (Silberschatz, 2005; Weiss, 1993), posits that early adverse experiences are internalized as conscious or unconscious pathogenic beliefs. For instance, a person who was raised by physically or emotionally abusive parents typically develops a conscious or unconscious conviction that he or she was bad and deserved mistreatment. When someone deeply believes he or she deserves mistreatment, that person might subsequently find himself or herself in abusive situations or relationships (Cloitre et al., 2009; Weiss, 1993). These emotion-laden, powerful, painful convictions about self and others that cause severe emotional distress (Silberschatz, 2005) is what Weiss referred to as “pathogenic beliefs.”

Pathogenic beliefs

There are a variety of empirical psychotherapy studies showing that idiographic pathogenic beliefs can be reliably identified by trained judges (e.g., Curtis, Silberschatz, Sampson, & Weiss, 1994; Rosenberg, Silberschatz, Curtis, Sampson, & Weiss, 1986) and that therapeutic progress is significantly correlated with therapists disconfirming their patients’ pathogenic beliefs (e.g., Silberschatz & Curtis, 1993; Silberschatz, Fretter, & Curtis, 1986; for an overview see Silberschatz, 2005, chapter 11). Other self-report measures of pathogenic beliefs, such as the Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978), Irrational Beliefs Inventory (IBI; Koopmans, Sanderman, Timmerman, & Emmelkamp, 1994), and other similar measures (for a review see Bridges & Harnish, 2010), are tied to specific theories of psychopathology or diagnostic models. The nomothetic Pathogenic Beliefs Scale (PBS) is different in that it measures transdiagnostic internalized beliefs that people actually expressed in therapy (i.e., were clinically derived) and assesses cognitions related to common psychopathology symptoms and diagnoses. As such, this transdiagnostic perspective of psychopathology fits with the Research Domain Criteria (RDoC) recently proposed by the National Institute of Mental Health. Such a perspective is also useful to clinicians who typically focus on the expressed complaints of a particular patient and identify specific cognitions, problems, or symptoms as the target of treatment.

Aims of this study

To further explore if and how the internalization of early negative parenting, in the form of pathogenic beliefs, affects the development of psychopathology in adulthood, we focused on the relationship between perceived negative parenting style, self-reported pathogenic beliefs, and common adult psychopathology symptoms. We applied the idiographic pathogenic belief formulation method used in psychotherapy research, which includes assessment of traumas the patient has experienced, pathogenic beliefs the patient has developed, and the patient's goals for therapy (Curtis & Silberschatz, 2005). Our aim was to test an adapted nomothetic self-report version of this formulation method (the PBS; see later) for the assessment of pathogenic beliefs in a nonclinical population. We examined the reliability of the measure and assessed how the scale correlates with perceptions of negative parenting style and common psychopathology symptoms (anxiety, low self-esteem, emotional instability, pessimistic attitude, and depression). We hypothesized that pathogenic beliefs would mediate the relationship between perceived negative parenting style and common psychopathology symptoms and would explain differences in levels of psychopathology.

Method

Participants and procedures

Recruitment

Our convenience sample was comprised of 732 people who were recruited via word of mouth, service organizations, and online advertisement on Web sites where volunteers could participate, including student Web sites (e.g., <http://psych.hanover.edu/research/exponnet.html>; <http://www.socialpsychology.org/expts.htm#pinterpersonal>), Craigslist, and psychology listservs (e.g., psychotherapyresearch.org) with a link directed to surveymonkey.com. We aimed to recruit a diverse sample of people representing various ages, education levels, and socioeconomic backgrounds. Participants were asked to forward information about the study and the link to the survey Web site to friends, colleagues, or relatives.

Informed consent

All potential participants were asked to read and sign the informed consent statement before commencing the online survey. Participants were informed about their right to refuse to participate or withdraw from participation at any time, that their participation was voluntary, and that they would not be compensated. Strict confidentiality was assured by the facts that the survey was completely anonymous and that no identifying information was requested. To allow for questions or complaints with regard to the survey, the principal investigator's name and contact information were provided.

Participants

The sample consisted of 732 adult participants. We ensured people could not complete the survey twice by checking for duplicate IP addresses. We thoroughly cleaned the data before analysis, and we screened the data for random responding on the outcome measures by checking for duplicate responses, skewed results (responses that have all the same answers or have certain patterns), missing data, and data inconsistencies. Besides looking at the raw data, we used graphical methods (scatter, box plots, and histograms) for detecting outliers. No participant was removed due to a suspicious responding pattern.

Most participants were female (72.2%) and identified primarily as White (76.3%). The majority of participants had some postsecondary education (76.5%). Detailed demographic information is presented in [Table 1](#).

Measures

The battery of questions could be completed by the participants in 15 to 20 min. The battery included a brief demographic questionnaire, a scale of retrospectively reported parenting styles, personality and psychopathology measures, and the PBS.

The Pathogenic Beliefs Scale

The PBS is a 59-item inventory of conscious and unconscious pathogenic beliefs derived from previous psychotherapy research (Curtis & Silberschatz,

Table 1. Descriptive Statistics of the Community Sample.

Measure		<i>M</i>	<i>SD</i>	Min	Max	<i>N</i>	<i>n</i>	%
Descriptive	Gender							
	Male					729	203	27.8
	Female						526	72.2
	Age	36.25	15.93	16	95	708		
	Ethnicity							
	Asian					729	57	7.8
	African American						27	3.7
	Indian American						4	0.5
	White						556	76.3
	Latino						36	4.9
	Other						49	6.7
	Education							
	High school					728	99	13.6
	College						397	54.6
	Graduate degree						232	31.9
Negative parenting style	MOPS total	.67	.46	0	2.60	732		
	MOPS mother	.67	.57	0	2.80	732		
	MOPS father	.67	.60	0	2.67	732		
Pathogenic beliefs	PBS total	2.72	.45	1.72	4.28	732		
Psychopathology	Path5 total	3.11	.19	2.44	3.60	732		

Note. MOPS = Measure of Parental Style; PBS = Pathogenic Beliefs Scale; Path5 = pathology measured on the International Personality Item Pool.

2005; Curtis et al., 1994; Rosenberg et al., 1986). Participants were asked to read each of the items and rate on a 5-point Likert scale the degree to which it was applicable or accurate. Examples of representative items on the PBS are shown in Table 2. Higher scores reflect identification of higher levels of pathogenic beliefs, with mean scores ranging from 0 to 4. More detailed information and a copy of the PBS can be obtained from the authors.

Items for the PBS were derived from idiographic case formulations of 21 psychotherapy cases, which included both time-limited cognitive-behavioral and psychodynamic therapies as well as long-term psychodynamic treatments. Verbatim transcripts of initial sessions from these cases were read by experienced psychotherapists (three to six clinicians). Following training in the control-mastery case formulation method (e.g., Curtis & Silberschatz, 2005; Curtis et al., 1994; Rosenberg et al., 1986), they independently prepared lists of pathogenic beliefs for each case (Curtis & Silberschatz, 2005). A total of 144 (nonredundant) pathogenic beliefs were generated. A team of four judges (two experienced, licensed clinicians and two advanced doctoral-level clinical psychology interns) independently categorized the idiographic beliefs into nomothetic categories, resulting in the 59-item inventory. An example of idiographic beliefs and their corresponding nomothetic category include the following: “He worried that having his own independent life would hurt his parents” and “She believed that if she were to pursue her own interests and goals she would feel that she is abandoning her family” are contained in the nomothetic category “Separating from parents or loved ones would be hurtful, disloyal, or make them feel abandoned.” Although other pathogenic belief measures were not administered in this sample, and we therefore cannot comment on the convergent and discriminant validity, conceptually the PBS is different from measures such as the DAS (Weissman & Beck, 1978), IBI (Koopmans et al., 1994), and other irrational belief self-report

Table 2. Example Items on the Pathogenic Beliefs Scale.

I need to defer to others instead of pursuing my own ideas, needs, or interests.
It is wrong, threatening, or disloyal to surpass one’s family or significant others.
I do not deserve to be happy.
I should not separate from family or loved ones.
Loving someone means that I need to be idealizing, admiring, and subservient.
I should not recognize or be critical of a parent’s or loved one’s problems/limitations.
Separating from parents or loved ones would be hurtful, disloyal, or make them feel abandoned.
I am responsible for the feelings or behavior of others.
I should never challenge others or assert my own point of view.
I should play down achievements or success in order to avoid diminishing, offending, or emasculating others.
I must surrender control to others.
I should emulate or identify with parents or other significant family members in order to avoid hurting them.
I believe that I must be perfect in order to feel good about myself.
I believe that I am responsible for the feelings or behaviors of others.

measures (see Bridges & Harnish, 2010 for a review) in that the PBS items were drawn from psychotherapy cases (bottom up) rather than from particular theory (top down). The PBS can therefore be seen as client-centered; it was not designed to test theoretical models or identify diagnostic categories such as depression or anxiety (as was the case in the irrational belief measures reviewed by Bridges & Harnish, 2010), but the nomothetic PBS aimed to measure transdiagnostic internalized beliefs that people actually expressed in therapy (i.e., were clinically derived) and that address common psychopathology symptoms more generally.

To examine the factor structure of the PBS, we conducted an exploratory factor analysis with Varimax rotation. One factor best explained the observed covariation matrix within the data set;¹ all of the 59 items showed high loadings (18.255 eigenvalue) on the first factor (31% of the explained variance, with a second factor explaining an additional 6% only). The scree plot indicated that one factor explained a sufficient degree of variance, with a clear “elbow” point in the downward curve. This suggests that one homogenous factor underlies participants’ responses to the 59 PBS items and that all these items seem to tap the same global construct of pathogenic beliefs. On this basis, we computed a total PBS score for participants by averaging their responses to the 59 items.

Measure of Parental Style

The 15-item Measure of Parental Style (MOPS; Parker et al., 1997) evolved from the earlier 25-item Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979), introduced as a measure of perceived parenting characteristics that contribute to the quality of the parent–child bond. The PBI probes adult recollections of parental behaviors and attitudes during the person’s childhood and has been used as a parenting style measure in many studies on the parenting-cognitive vulnerability and parenting-pathology relationship (Alloy, Abramson, Smith, Gibb, & Neeren, 2006). High levels of reliability and validity have been reported (Parker, 1988). Two decades later, Parker and his colleagues designed a modified version of the PBI, the MOPS. The MOPS measures three subscales—parental abuse, indifference, and overcontrol—and consists of a total of 15 statements (e.g., “verbally abusive,” “ignored me,” “overprotective of me”) scored on a 4-point Likert-scale that participants recall about either their relationship with their mother (maternal form) or father (paternal form) during their first 16 years of life. The measure can be administered separately with respect to each caregiver in the individual’s early life. In this study, the MOPS was completed with reference to both mother and father, and the scores were averaged (Parker et al., 1997) as done by several other studies (e.g., Dalgleish et al., 2003; Valiente et al., 2014; for the PBI), resulting in a possible range from a minimum of 0 to a maximum score of 4. Due to the nonsignificant, very minimal differences in reported scores on the maternal and paternal MOPS forms in our sample, a combined total mean MOPS

score (i.e., general parental score) was used in further analyses. The level of perceived negative parental practices is reflected in the total summed MOPS score, with a higher score indicating more reported general negative parenting experiences. The MOPS has recently been validated in nonclinical studies (Picardi et al., 2013) as well as clinical samples, relating perceived negative parenting style with psychopathology development in adulthood (e.g., Fletcher, Parker, Bayes, Paterson, & McClure, 2014; Parvez, 2013; Vracotas & Malla, 2011).

International Personality Item Pool

Level of psychopathology was measured by five previously validated scales from the International Personality Item Pool (Goldberg, 1999; Goldberg et al., 2006), reflecting common psychopathology symptoms (NEO N1 Anxiety, NEO N3 Depression, BF Emotional Stability, PAS Self-esteem, PAS Optimism). Sound psychometric results have been reported for each of these five measures (Goldberg, 1999); moreover, the combination of emotional instability, low self-esteem, pessimism, anxiety, and depression, although not previously tested, reflects indications of the most common psychopathology symptoms. We thought that this broad measure (hereafter summarized as Path5) would lead to better participation and retention of participants from the general population and less social desirability in their responses than scales more specifically focused on symptoms such as extreme mood fluctuation and suicidality. To calculate a total symptom score for each participant, the scores on the Emotional Stability, Self-Esteem, and Optimism subscales were reversed and added to the scores on the Anxiety and Depression subscales. Higher scores reflected higher levels of psychopathology. This total symptom score was divided by five to create the mean pathology score (Path5), resulting in a possible range from 1 to 5.²

Analyses

Descriptive analysis

Analyses were performed with SPSS, version 22. The mediation analysis was conducted using the SPSS macro script by Preacher and Hayes (2008). All statistical tests were two-tailed, with alpha set at .05. A descriptive analysis was used to study the frequency distribution of the variables of interest. The sample size in the correlation, regression, and mediation analyses was 732 (where participants left one or more items blank, the item sample mean scores were inserted)³. Differences in scores between sociodemographic subgroups were tested with analyses of variance (ANOVAs) and *t* tests.

Validation analysis

To examine the factor structure of the PBS, as well as the Path5, we conducted exploratory factor analyses with Varimax rotation. We also

explored the downward curves displayed on the scree plots and the total amount of variability of the original variables explained by each factor solution. Then we determined the reliability of the PBS, as well as the Path5, in terms of internal consistency by means of coefficient alpha. Correlation and regression analyses were used to assess associations among the three variables and prediction of common adult psychopathology symptoms following reported negative parenting style and pathogenic beliefs. In line with the exploratory nature of the analysis, a stepwise regression method (minimizing Wilks's lambda) was used (Field, 2009). The final stage was to test the potential role of pathogenic beliefs as mediators in the relationship between negative parenting style and psychopathology. This was done using Baron and Kenny's (1986) regression method, where the association between MOPS and Path5 scores was tested once the association of PBS and Path5 scores had been taken into account.

To establish complete mediation, the following conditions had to be met: (a) The independent variable (parenting) must predict the dependent variable (pathology); (b) the mediator (pathogenic beliefs) must predict the dependent variable (pathology); and (c) the association between the independent variable (parenting) and dependent variable (pathology) must be reduced or eliminated when the mediator variable (PBS) is added to the model. If the association is reduced, but still significant, the mediation is considered partial rather than complete (Hayes, 2013).

Results

The sample's reported PBS, MOPS, and Path5 scores are summarized in Table 1. The *t* tests and ANOVAs were conducted comparing the differences in responses on the MOPS, PBS, and Path5 measure for different gender, level of education, and ethnicity. Females showed higher ratings of reported general negative parenting on the MOPS than males, $t(600) = -2.68$, $p = .008$. Other than gender, there were no substantial differences in education levels ($p > .145$) and ethnicity ($p > .127$).

The analyses of the Path5 showed that the five components form an internally consistent measure of common psychopathology symptoms. The five subscales were significantly correlated ($p < .001$) with each other, and we found excellent internal reliability with a Cronbach's alpha of $>.96$ for all 33 nonoverlapping items. The overall Path5 score was dimensionally confirmed through factorial analysis, with principal component analysis indicating an eigenvalue of 82.087 for one factor, (44% of variance explained) and 10.856 or lower for the other factors (less than 6% of additional variance explained). Reliability analyses showed that the Cronbach's alphas of the total scores on the PBS ($\alpha = .96$; 59 items), Path5 ($\alpha = .96$; 33 items) and MOPS ($\alpha = .92$; 30 items) were high, indicating a high level of internal reliability for each of the three measures.

Bivariate correlations between the MOPS, PBS, and Path5 total scores indicated that the different variables were significantly correlated (all $ps < .01$). As hypothesized, correlations indicated that reported negative parenting style was associated with increased pathogenic beliefs ($r = .261$) and increased levels of pathology ($r = .152$)⁴. Further, as levels of pathogenic beliefs increased, levels of pathology also increased. The correlations also showed that the PBS was positively and very highly correlated with Path5 scores ($r = .559$). These findings indicated that our measure of pathogenic beliefs shared some variance with existing measures of perceived negative parenting style and current adult psychopathology symptoms.

Predicting psychopathology

There was no evidence of multicollinearity in these data (tolerance $> .9$). Moderation (age, gender⁵, and education) and mediation (age) analyses showed that none of the descriptive variables were significant moderators or mediators for the predictions of the three scales (PBS, MOPS, Path5).

Although PBS, MOPS, and Path5 all significantly predicted each other ($p < .01$), theoretically we were most interested in the following regressions: MOPS alone predicting PBS, PBS alone predicting Path5, and MOPS and PBS predicting Path5.

The MOPS significantly predicted Path5 scores, $b = .152$, $t(730) = 4.16$, $p < .001$, fulfilling the first requirement of mediation. The MOPS explained a statistically significant but very small proportion of variance (.02%) in Path5 scores, $R^2 = .022$, $F(1, 730) = 17.29$, $p < .001$. Additionally, in line with the second requirement for mediation, the PBS significantly predicted Path5 scores, $b = .559$, $t(730) = 18.23$, $p < .001$, explaining a significant proportion of variance (31%) in Path5 scores, $R^2 = .31$, $F(1, 730) = 332.38$, $p < .001$.

Consistent with a full mediation model, when the mediator variable (PBS) was added to the model, the association between the MOPS and Path5 was eliminated. Together, the PBS and MOPS explained a significant proportion of variance in Path5 scores, $R^2 = .311$, $F(2, 729) = 165.99$, $p < .001$. However, the effect of the MOPS reduced dramatically; the additional variance explained when combined with the PBS measure was practically zero (0.1%), and only the PBS was found to be a significant predictor of Path5, $b = .558$, $t(729) = 17.54$, $p < .001$. The fact that the significant initial relationship between the independent variable MOPS and dependent variable Path5 ($b = .150$, $p = .000$) became nonsignificant after controlling for the mediator PBS ($b = .007$, $p = .838$) indicates that the PBS score mediates the relationship between the MOPS and Path5. This significant indirect relationship between MOPS and Path5 through the scores on the PBS, $b = .007$, bootstrapped confidence interval (Bca CI) [0.090, 0.191], with (Preacher & Kelley, 2011) effect size $k^2 = .157$, Bca CI [0.108, 0.208] is shown in the mediation model in Figure 1.

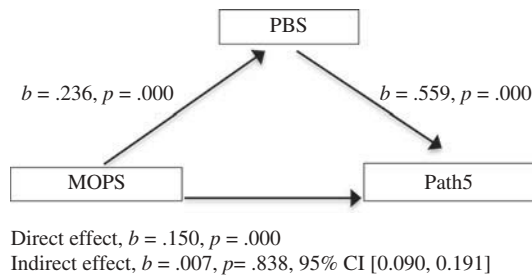


Figure 1. Mediation model of MOPS as a predictor of Path5 and mediated by PBS.

Note. MOPS = Measure of Parental Style; PBS = Pathogenic Beliefs Scale; Path5 = pathology measured on the International Personality Item Pool; CI = confidence interval. $N = 732$.

Discussion

The primary purpose of this study was to contribute to the current empirical literature on mechanisms underlying the effects of negative parenting style on the development of psychopathology. This study reports on pathogenic beliefs as a potential mediating mechanism explaining the predictive relationship between perceived negative parenting style and subsequent common psychopathology symptoms in adulthood, although other measures of pathogenic beliefs exist, and future studies will need to investigate the degree of overlap between those measures and the PBS. It is important to emphasize that the PBS was developed to reflect the experiences identified by patients themselves without being biased by specific therapy models and theories.

This study has confirmed the finding that adults with higher levels of pathology recall their childhoods as characterized by more negative parenting style. Overall, the amount of variance in the occurrence of adult psychopathology symptoms in this diverse community-based sample explained by pathogenic beliefs was large, and the negative parenting style reported on the MOPS did not add significantly to the prediction of common psychopathology symptoms. We found that pathogenic beliefs on the PBS play a mediating role in the relationship between reported negative parenting style and pathology and thus provides support for the role of cognition in mediating the link between negative parenting style and common psychopathology symptoms. This suggests that the predictive power of the reported general negative parenting style depends on the extent to which one develops pathogenic beliefs, rather than on the negative parenting style itself.

Our findings are consistent with widely reported clinical and empirical studies showing that there is a connection between negative parenting style and subsequent development of common psychopathology symptoms (e.g., Cloitre et al., 2009; MacIntosh et al., 2015; Parker, 1979; Schimmenti & Bifulco, 2015; Silove et al., 1991; Torresani et al., 2000). Moreover, the results are consistent with studies that used specific theoretical (top-down) measures

of cognitive processes that found that negative parenting styles are associated with and prospectively predictive of a variety of maladaptive cognitive processes (see Gibb, 2002, for a meta-analysis) that increase individuals' risk of depression or bipolar disorder (reviewed by Alloy et al., 2006). Identified mediating cognitive processes include, for example, negative cognitive styles (e.g., Alloy et al., 2001; Gibb, Alloy, & Abramson, 2003; Gibb et al., 2001; McGinn, Cukor, & Sanderson, 2005), negative core beliefs (Harris & Curtin, 2002; Shah & Waller, 2000), negative internalized beliefs (Coates & Messman-Moore, 2014), evaluative beliefs (Valiente et al., 2014), and early maladaptive schemas (Nia, Sovani, & Forooshani, 2014).

Our study replicated these existing research findings with a clinically derived, self-report, nomothetic (bottom-up) pathogenic belief measure, adding to the evidence that the degree to which perceived negative parenting style leads to psychopathology symptoms later in life depends in large part on what beliefs the person forms about that parenting experience. Consider, for example, adults whose parents were frequently emotionally neglectful or unresponsive to their children's needs. How a person internalizes those adverse experiences is predictive of subsequent psychopathology. The person who believes that parental neglect was what they deserved because they themselves feel truly unworthy of care and attention is far more likely to develop psychopathology symptoms than the person who came to believe that parental depression was the cause of the negative parenting style (Cloitre et al., 2009; Silberschatz, 2005; Weiss, 1993).

These results support the assumption based on control-mastery theory (Silberschatz, 2005) that psychopathology often stems from negative parenting experiences that are internalized as pathogenic beliefs. These results also suggest that pathogenic beliefs can be reliably assessed in nonclinical samples using self-ratings. Our findings are consistent with earlier research showing that self-ratings on pathogenic beliefs were significantly correlated with measures of psychopathology (Sammet, Leichsenring, Schauenburg, & Andreas, 2007).

Limitations

This report is limited by several factors, the first of which was the use of an online recruited convenience sample. The Internet survey is an efficient, flexible, and cost-effective method (Batterham, 2014), which enabled the recruitment of a relatively large community sample. Although the external validity of Internet community samples could be debated (Krantz & Dalal, 2000), online community samples have been deemed representative of the general population at large (e.g., Meyerson & Tryon, 2003) and could be considered to provide a normative pattern of association. Second, although a variety of sample characteristics were collected and reported in this study, no socioeconomic characteristics were collected. Future research should assess

the potential moderating effect of socioeconomic status on the findings. Third, the participants in the study represented a relatively educated sample. Therefore, caution should be applied in generalizing our results to a broader population. Fourth, the MOPS is based on retrospectively recalled perceived negative parenting experiences. Gaining information about parenting experiences in childhood retrospectively has advantages (i.e., immediate and comprehensive information) and has proven to be valid in more longitudinal studies (Wilhelm, Niven, Parker, & Hadzi-Pavlovic, 2005). Although some question the validity of retrospective measurements, Brewin, Andrews, and Gotlib (1993) concluded their extensive literature review arguing that retrospective recollections of adversity, although not perfect, are for the most part quite accurate. Fifth, the use of the combination of five subscales from the International Personality Item Pool as an indicator of common psychopathology symptoms limits the comparability of these findings. It should be noted, however, that these five scales (either individually or in combination) have been found to be reliable and valid measures (Goldberg et al., 2006).

The study design was cross-sectional and relied on self-reports. Reliance on self-report measures increases the possibility of shared method variance and can thereby artificially inflate correlations between the variables assessed. Self-report ratings of pathogenic beliefs might be particularly problematic because they measure only those beliefs that people are consciously aware of. It could be argued that many pathogenic beliefs are at least in part unconscious (Silberschatz, 2005). Previous research (Curtis & Silberschatz, 2005; Curtis et al., 1994) has shown that clinicians can reliably assess psychotherapy patients' unconscious pathogenic beliefs. In future research we plan to compare self-report and clinicians' ratings of pathogenic beliefs to shed further light on possible differences between consciously reported and unconscious pathogenic beliefs.

Furthermore, the reported perceived negative parenting style differed according to gender. In our data, we did not identify different results with regard to the mediation of the PBS on the relationship between MOPS and Path5. Future research testing interaction effects with gender could better allow the identification of potential invariance in the results and could verify if the mediation model yields the same results when moderated by gender.

In summary, pathogenic beliefs appear to mediate the relationship between perceived negative parenting style and subsequent common psychopathology symptoms in adulthood. The experience of negative parenting, independent from its effect on cognitive development, is unarguably a traumatic experience for any child. However, this research suggests that it might be the internalization of this experience, in the form of pathogenic cognitive processes, that allows negative parenting style to have far-reaching negative consequences. One important clinical implication of this study is that clinicians and researchers should evaluate not only evidence of negative parenting style, but also whether the person

developed pathogenic beliefs based on these negative parenting experiences. Identifying pathogenic beliefs might help victims of early maltreatment and abuse understand the interrelationships between their adverse experiences and potential symptoms. Using a scale of pathogenic beliefs might make victims more aware of the agency they have in the way they interpret these experiences and how they might be able to reduce their negative impact by working to change pathogenic beliefs.

Notes

1. The first factor had an eigenvalue of 18.31. (Eigenvalues Factor 2 = 3.05; Factor 3 = 2.21; Factor 4–11 range = 1.78–1.05. On the scree plot, we explored the relative size of the factors by fitting a line through the scree factors and the mountain-side factors, which showed only one factor above the elbow point.
2. We realized postrecruitment that for the Depression subscale, the item “I am often down in the dumps” was missing from the online survey. Therefore, the total subscale score consists of 9 items rather than the original 10, and the mean subscale score was calculated as total score of 9 items divided by 9.
3. Results were comparable for the sample when missing items were removed pairwise, listwise, or replaced by the item mean score. For consistency and ease of comparison, the total sample of 732 is reported in the article.
4. The specific analyses of individual subscales on Path5, MOPS, and PBS did not give a more differentiated picture than having them combined; no difference between different types of pathology, abuse, or pathogenic beliefs were found. For reasons of clarity we therefore are reporting just the total scores on the broad measures.
5. A regression controlling for gender (in Step 1) showed that results hold while entering gender in the equation. More specifically, the mediation analysis showed that, controlling for the effect of the covariate gender ($b = .04$, $SE = .0467$, $p = .3925$), the MOPS had a significant total effect on the Path5 ($TE = .1881$, $SE = .0536$, $p = .005$), no significant residual direct effect, $DE = -.0415$, $SE = .0416$, $p = .3198$), and a significant indirect effect ($IE = .2296$, $SE = .0387$, $LL = .1547$, $UL = .3283$).

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