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Temperament, parenting styles and the intensity of early maladaptive schemas: assessment of correlations in a non-clinical adult group

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Abstract

Background: Prior research has partially verified the significance of child temperament and styles of upbringing for schema intensity. However, there is still a lack of understanding of the inter-relations between them.
Aim: The present study examined how temperament (stable and labile) and style of parenting (positive and negative) are related to each other, and to early maladaptive schemas.
Method: Participants (395 healthy adults) completed the Young Schema Questionnaire YSQ-S3 and the Retrospective Assessment of Parents' Attitudes and Formal Characteristic of Behaviour – Temperament Inventory (FCB-TI). Structural equation modelling was used to verify hypotheses.
Results: Temperament and parental styles together explain more than 59% of the variance of schema intensity. The obtained path coefficients show one-way directions of inter-relations. Stable temperament connects to schemas directly with a negative path coefficient. Labile temperament shows a significant positive association with negative parental attitudes, but not directly with schemas. Negative parenting is positively connected with schemas. A positive style of parenting is not significantly connected with temperament and schemas.
Conclusions: Results show evidence that negative style of parenting and labile temperament features are more important for schema developing and may be treated as risk factors. Because temperament seems to be a relatively persistent feature, it may play a similar role in adulthood, reinforcing emotions and feelings in the context of environment, and then maintain the schemas.

Keywords: early maladaptive schemas; parental styles; temperament

Introduction

Jeffrey Young and colleagues defined early maladaptive schemas (EMS) as dysfunctional, pervasive patterns, consisting of memories, emotions, cognitions and bodily sensations, developed during childhood or adolescence through interactions between adverse relational experiences and one's temperament (Young *et al.*, 2003). The theory of EMS is still being empirically verified. Most research looks into the consequences of schemas. Authors focus mainly on finding relationships between schemas and various types of difficulties experienced both by people with different disorders (Bach and Farrell, 2018; Barazandeh *et al.*, 2016; Flink *et al.*, 2018; Hawke and Provencher, 2011) and healthy subjects (Carr and Francis, 2010a, 2010b; Roelofs *et al.*, 2011; Mącik and Sas, 2015).

Relatively less research focuses on developing schemas. According to Young, the essence of schema formation is the interaction between the environment and temperamental

characteristics. On the one hand, the environment (parental behaviour) may overcome the role of temperament (i.e. a child with an emotional temperament can become a strong person) or intensify his/her personality traits (the child will become even more sensitive). On the other hand, an extremely emotional temperament can prevail even in a very friendly and supportive environment, and be the cause of stronger schemas and, consequently, psychopathological symptoms (Young *et al.*, 2003). Only few studies focus on these assumptions more directly.

Some of them consider the role of early experiences, such as early childhood trauma or parental diseases (Cámara and Calvete, 2012; Carr and Francis, 2010a; Dale *et al.*, 2010; Gonzalez Diez *et al.*, 2012; Griffiths, 2014; Kaya Tezel *et al.*, 2015). Most of these studies treat schemas as mediators or moderators in the context of a specific psychopathology, and focus mainly on consequences of early experiences and schemas. The authors conclude that trauma, neglect and abuse are significantly connected to schema severity, and both lead to more severe psychopathology (Greenfield and Marks, 2010; Karatzias *et al.*, 2016; Pietri and Bonnet, 2017; Smyth *et al.*, 2017). However, non-violent parental behaviour can also lead to more severe schemas and psychopathology. The study of Mącik and colleagues (Mącik *et al.*, 2016), conducted on healthy families, showed numerous strong positive correlations of daughters' schemas and over-demanding and inconsistent mothers' (but not fathers') behaviour, and strong negative correlations – with mother's and father's accepting attitudes. Parental rejection or excessive control are significant factors in intensifying schemas (Muris, 2006; Khajouei Nia *et al.*, 2014; Dale *et al.*, 2010), as well as motherly (Hoffart Lunding and Hoffart, 2016) and fatherly overprotection (Monirpoor *et al.*, 2012). Lim and Barlas (2019) also confirm the role of parental behaviour and EMS for depressive symptoms.

Some other studies point (more or less directly) to the role of temperament in schema intensity. Temperament is connected to various adaptive disorders, such as somatic symptoms of anxiety, feelings of increased stress (Fruehstorfer *et al.*, 2012) or depressive symptoms (Hintsa *et al.*, 2016). Perceiving everyday stress as dependent on a person (Sobolewski *et al.*, 2001) and assessing one's own social competences (Martowska, 2014) are also associated with temperament. This allows us to assume that there is a connection between schemas and temperament, provided that both are related to psychopathology or to negative self-thinking. However, this connection has been only partially confirmed so far. Eskedal and Demetri found that fearful and restrained children can make their parents take a condescending approach and thus strengthen an overprotective attitude (Eskedal and Demetri, 2006). Calvete discovered that temperament (mainly neuroticism) is a mediator between emotional abuse and schema severity, and plays an essential role in EMS genesis (Calvete, 2014). Mairet and colleagues also confirmed the role of neuroticism, mainly in the disconnection/rejection domain (Mairet *et al.*, 2014). Halvorsen and colleagues examined the function of temperament and EMS in predicting depression. They noted that a temperamental characteristic such as harm avoidance was positively related to most schemas, while self-direction was negatively related (Halvorsen *et al.*, 2009). Fischer *et al.* (2016) found that psychological flexibility fully mediated between parental styles and the strength of schemas. A systematic review of studies conducted by Lim and colleagues also confirmed the role of temperament for schema severity (Lim *et al.*, 2018), due to its more biological, constitutional nature.

The above-mentioned studies confirm the importance of both temperament (especially weak and emotional features) and environment (in terms of parental attitudes/behaviours) for schema severity and psychopathology symptoms. However, most of them treat EMS as mediator/moderator in tested models. Authors premise their existence and strength, but cannot explain the way childhood experiences and temperament are connected to intensity of schemas, and how they develop. Consequently, we do not know what we can do and what is possible to prevent the development of strong schemas. Conducting studies on clinical samples can also reduce their usability in understanding factors important for schema severity. Experiencing difficulties such as depression, stress or anxiety may change the assessment of childhood and

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the self (Stopa and Waters, 2005). This may be why some research does not confirm the dependencies. Haugh *et al.* (2017) verified the role of both parental styles and temperament as EMS predictors and their contribution to the appearance of depression symptoms. They concluded that temperament has a significant effect on the relationship between parental style and depressive symptoms, but it may not play a significant role in the child's reactions to negative parental behaviour, and thus in exacerbating schemas. However, people with depression may evaluate their temperament differently than while they were healthy, describing themselves as less lively or active. That it why it is important to verify the role of temperament and parental behaviour by testing healthy people. Besides, Young claims that schemas are present in all people, but to different extents. Therefore some people experience no psychological difficulties, some may complain of absence of meaning of life, and only some suffer different symptoms (Young *et al.*, 2003). If temperament plays an important role, some psychotherapy goals would be difficult to achieve. Until now, it has not been clear if relations between schema severity, early relational experiences and one's temperament are the same in healthy people as in different clinical groups.

The aim of this study was therefore to test a healthy adult group to investigate the interrelations between participants' parent's behaviours towards them in childhood, temperament, and the intensity of EMS in adulthood. Therefore two main goals of the research were proposed. One goal is to check if positive parenting could be similarly significant as a negative one for developing schema. Based on the theory of schemas and on the previous research, it was hypothesized that *Parents' negative behaviours are more relevant for schema intensity than positive ones* (H1). The second goal was to verify the role of temperament in the context of parenting. Due to constitutional, more biological nature of temperament it was hypothesized that *temperament is linked to the parents' behaviours but not directly to schemas* (H2).

Method

Participants

A healthy adult sample was used to avoid links with a specific psychopathology, which could change the self-assessment. The study involved 400 people, 395 of whom were included in the analysis; 52.8% were women. The average age of the participants was 33.23 years ($SD = 12.96$; minimum = 18; maximum = 74). The age statistics did not differ significantly between the male and female groups.

The participants were recruited from adults who responded to an advertisement posted on the university intranet, social media or who were invited to join in by trained psychology students (older participants). Participants' gender and age distribution was equal. In order to maintain the group's non-clinical status, each person in the group was interviewed briefly. Having children was not an inclusion criterion, as participants were asked to report their own experiences of how they were parented in childhood. The criteria for exclusion from the group were: cognitive difficulties observed during the interview, ongoing neurological treatment, current or previous (within the last 2 years) serious somatic diseases suffered by the examined person or his/her close family member (in the case of cancer, in the previous 5 years); major life events such as mourning, a loss of job or divorce within the last 2 years; psychiatric diagnosis and/or treatment, as well as receiving psychological assistance/therapy at any point in life. All participants were volunteers, they completed paper questionnaires.

Design

The following methods of measurement were applied (descriptive statistics and factor loadings for used variables are presented in Table 1).

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Table 1. Descriptive statistics and CFA factor loadings for used variables

Construct	Indicator/ composite score	Descriptive statistics						CFA factor loadings	
		Mean	*SD*	Minimum	Maximum	Skewness	Kurtosis	Initial	After items dropping
Schemas	SD1	11.46	4.012	5.00	23.80	0.686	0.047	0.912	0.912
	SD2	10.33	3.757	5.00	24.50	0.773	0.369	0.867	0.867
	SD3	13.88	3.842	5.00	28.50	0.225	0.399	0.672	0.673
	SD4	14.25	3.517	5.00	27.67	0.192	0.637	0.773	0.774
	SD5	13.69	3.744	5.00	25.25	0.138	−0.152	0.854	0.854
	Comp. Score	51.47	13.317	20.40	93.34	0.371	0.171	n/a	n/a
Father's positive attitudes	FA1	35.57	9.567	10.00	50.00	−0.522	−0.370	0.849	0.862
	FA3	35.96	7.943	10.00	50.00	−0.560	0.219	0.959	0.945
	Comp. Score	64.65	15.006	18.93	90.35	−0.559	−0.089	n/a	n/a
Father's negative attitudes	FA2	28.15	8.682	10.00	50.00	0.143	−0.378	0.902	0.874
	FA4	27.12	9.126	10.00	50.00	0.254	−0.573	0.859	0.882
	FA5 (dropped)	28.44	7.559	10.00	50.00	0.031	0.052	0.228	n/a
	Comp. Score	48.52	14.715	17.56	87.80	0.245	−0.417	n/a	n/a
Mother's negative attitudes	MA2	27.47	9.332	10.00	50.00	0.339	−0.426	0.940	0.929
	MA4	24.56	9.704	10.00	50.00	0.417	−0.466	0.891	0.901
	MA5 (dropped)	35.53	7.769	13.00	50.00	−0.327	−0.260	0.100	n/a
	Comp. score	47.65	16.686	18.30	91.50	0.420	−0.416	n/a	n/a
Mother's positive attitudes	MA1	38.88	8.637	11.00	50.00	−0.741	0.134	0.854	0.860
	MA3	36.97	8.042	10.00	50.00	−0.577	0.062	0.931	0.925
	Comp. score	67.63	14.086	22.15	89.25	−0.671	0.103	n/a	n/a
Positive attitudes (2nd order factor)	Comp. score	115.33	20.918	46.85	156.39	−0.328	−0.213	n/a	n/a
Negative attitudes (2nd order factor)	Comp. score	81.60	22.149	30.48	147.73	0.293	−0.027	n/a	n/a
Stable temperament	T1	14.83	3.788	1.00	20.00	−0.880	0.992	0.567	0.575
	T5	10.53	4.497	1.00	20.00	0.093	−0.563	0.727	0.765
	T6 (dropped)	9.43	4.428	1.00	20.00	0.081	−0.586	0.497	n/a
	Comp. score	16.59	4.814	1.34	26.80	−0.040	−0.430	n/a	n/a
Labile temperament	T2	12.62	4.332	2.00	20.00	−0.306	−0.682	0.602	0.611
	T3 (dropped)	14.52	3.765	1.00	20.00	−0.872	0.319	0.052	N/A
	T4	10.26	4.839	1.00	20.00	0.024	−0.881	0.942	0.925
	Comp. score	17.20	6.359	2.15	30.11	−0.048	−0.685	n/a	n/a

Variable labels as in Model 1 and Model 2 (see Figs 1 and 2).

Parental behaviour

This was assessed by the Questionnaire of the Retrospective Assessment of Parents' Attitudes by Plopa (2008), based on Roe and Siegelman's (1963) typology. The tool consists of two 25-item versions: assessment of the father and of the mother. Each version gives information about five parental attitudes: acceptance-rejection (meeting/not meeting the needs of safe attachment based on unconditional acceptance of the child), over-demanding (absolute obedience even in small matters, the parent is critical and punitive), autonomy (allowing the child to build their own identity), inconsistent (the parent is unpredictable, passing from acceptance to irritability; a lack of clear boundaries and expectations) and over-protective (excessive amount of attention given to the child, a conviction that the child is incompetent and requires considerable help and support). The participants' task is to refer from the adult's perspective the way he/she was parented during childhood, using a 5-point scale, where 1 stands for 'he/she was definitely not like that', and 5 stands for 'he/she was definitely like that'. Due to a significant and very high correlation coefficient and theory of parental attitudes, acceptance and autonomy were attributed to 'positive style' and over-demanding and inconsistent into

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'negative style', as explained further. Obtained Cronbach's alpha values were between 0.819 for maternal overprotection and 0.931 for father's acceptance.

Temperament

This was assessed by the Formal Characteristics of Behaviour – Temperament Inventory (FCB-TI) of Strelau and Zawadzki (1995). The method consists of 120 statements with Yes or No responses. Temperament is assessed on six subscales: Briskness, Perseveration, Sensory Sensitivity, Emotional Reactivity, Endurance and Activity; each one consists of 20 items. Scores are calculated according to the key (accordant answer is '1' point, discordant is '0') with results of 0–20 points; higher scores indicate a greater magnitude of a given temperament characteristic. Obtained Cronbach's alpha values were in range 0.803 for Briskness to 0.847 for Emotional reactivity.

Early maladaptive schemas

This was assessed by Young's Schema Questionnaire – Short Form (YSQ-S3). The method consists of 90 statements which the tested person relates to on a 6-point scale where 1 stands for 'completely false about me' and 6 stands for 'perfectly describes me'. The items are divided into 18 early maladaptive schemas allocated to five domains dependent on the kind of unsatisfied basic need (Young *et al*., 2003):

(1) Disconnection and Rejection; five schemas: abandonment/instability, mistrust/abuse, emotional deprivation, defectiveness/shame, social isolation;
(2) Impaired Autonomy and Performance; four schemas: dependence/incompetence, vulnerability to harm or illness, enmeshment/undeveloped self, failure;
(3) Impaired Limits; two schemas: grandiosity, insufficient self-control
(4) Other Directedness; three schemas: subjugation, self-sacrifice, approval-seeking;
(5) Over-vigilance and inhibition; four schemas: negativity/pessimism, emotional inhibition, unrelenting standards/hyper-criticalness, self-punitiveness.

Cronbach's alpha values were between 0.693 for self-sacrifice and 0.824 for failure.

Preliminary data analysis

Table 1 contains descriptive statistics of explicit variables used in the models, as well as descriptive statistics for latent variables – calculated as regression-weighted composite scores – with factor loadings from confirmatory factor analysis (CFA) used as weights. Additionally, the values of factor loadings from CFA for explicit variables were provided – low loadings were the basis for removing several variables from the measurement models, which were described later in the text (the removed variables are marked accordingly in Table 1).

In order to answer the research question, covariance-based structural equations modelling (CB-SEM) was conducted (using IBM SPSS AMOS 24.0). The intensity of schemas was treated as a dependent variable, and temperament and parental behaviours as explanatory variables.

Based on the assumptions of the applied diagnostic methods and the CFA confirmation analysis, the measured variables were grouped as described below. In the case of schemas, classification analyses were also performed (e.g. cluster analysis). It was found that the resulting groups did not significantly differ with respect to schema profiles – the configuration of schemas turned out to be very similar. The only difference was the intensity of these profiles. This phenomenon is typical of non-clinical samples, but some studies confirm the similarity of profiles also between clinical and non-clinical samples (Chodkiewicz and Gruszczyńska, 2018). Therefore, in the tested models (cf. Models 1 and 2), the decision was

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made to use a latent variable explained by five domains of schemas, treated as observable variables, thus accounting for the overall severity of schemas, rather than their specific structures.

Parental attitudes in the first step were grouped, separately for the father and mother, into positive (Acceptance and Autonomy) and negative (Demands, Over-protective and Inconsistency), according to the questionnaire structure described by Plopa (2008). In the next step, the path models also included two second-order factors combining the positive attitudes of the father and mother and the negative attitudes of both parents. Adopting such a solution is justified by the high factor loadings of variables which load second-order factors, as shown in Model 1 (Fig. 1, Table 1). The over-protective attitude, being positively correlated with both types of parenting with low factor loading and thus not differentiating, was removed from the models and did not form part of the analysis (see Table 1).

Temperament traits were also grouped into two latent variables: the stable (briskness, endurance, activity) and labile, weak temperament (perseverance, reactivity, sensory sensitivity), based on the description and recognition of these traits – such a combination of factors has not been tested so far. The analysis of factor loadings in the model indicated that the two scales Activity and Sensory Sensitivity had too low factor loadings (Table 1). Therefore, they were not included as components of latent variables but removed from the model and not examined in further analysis (Worthington and Whittaker, 2006).

Matching the CFA models – the initial one and the one diminished by rejected explicit variables – was good (Table 4), which allowed for essential analysis.

Positive and negative attitudes, as well as stable and labile temperaments, are highly negatively correlated, which confirms their dichotomous character. Moreover, there are no significant correlations between the attitudes of fathers and mothers, which can indicate independence from each other in terms of their parenting styles (Table 3).

Reliability and validity checks

The approach used has been validated on the study's sample (effective $n = 395$) by reliability analysis as well as CFA to assess convergent (Table 2) and discriminant validity (Table 3).

The results of the validity checks are more than satisfactory. For all constructs except Stable temperament, the reliability measures exceed standard requirements [both Cronbach's alpha and composite reliability (CR) coefficients are higher than the suggested 0.7; see Table 2]. Stable temperament is the only construct used that had an average variance extracted (AVE) slightly below the threshold value of 0.5 (being equal 0.492); the other indicators are also slightly below the recommended values, which suggests greater caution in making conclusions based on this construct. For other measures AVE ranges from 0.641 to 0.885, which suggests a high convergent validity of used measures (Table 2). Discriminant validity was assessed via the Fornell–Larcker criterion (Henseler *et al.*, 2015) and met standard requirements – all correlations between measures are lower than square roots from AVE (Table 3), with only a minor problem with distinguishing the stable temperament from labile temperament (only in this direction – not vice versa).

Obtained validity checks results make possible the use of the constructs mentioned in structural equation modelling.

Results

Two structural models were tested in this study

Model 1

Model 1 (Fig. 1) includes only parenting styles to check this variable's exclusive contribution to explaining schemas. Positive and negative parenting styles account for 33% of the variance in schema severity. Negative behaviours can be considered as a factor that increases the severity of schemas (standardised path coefficient = 0.43, $p = 0.006$), while the relationship between

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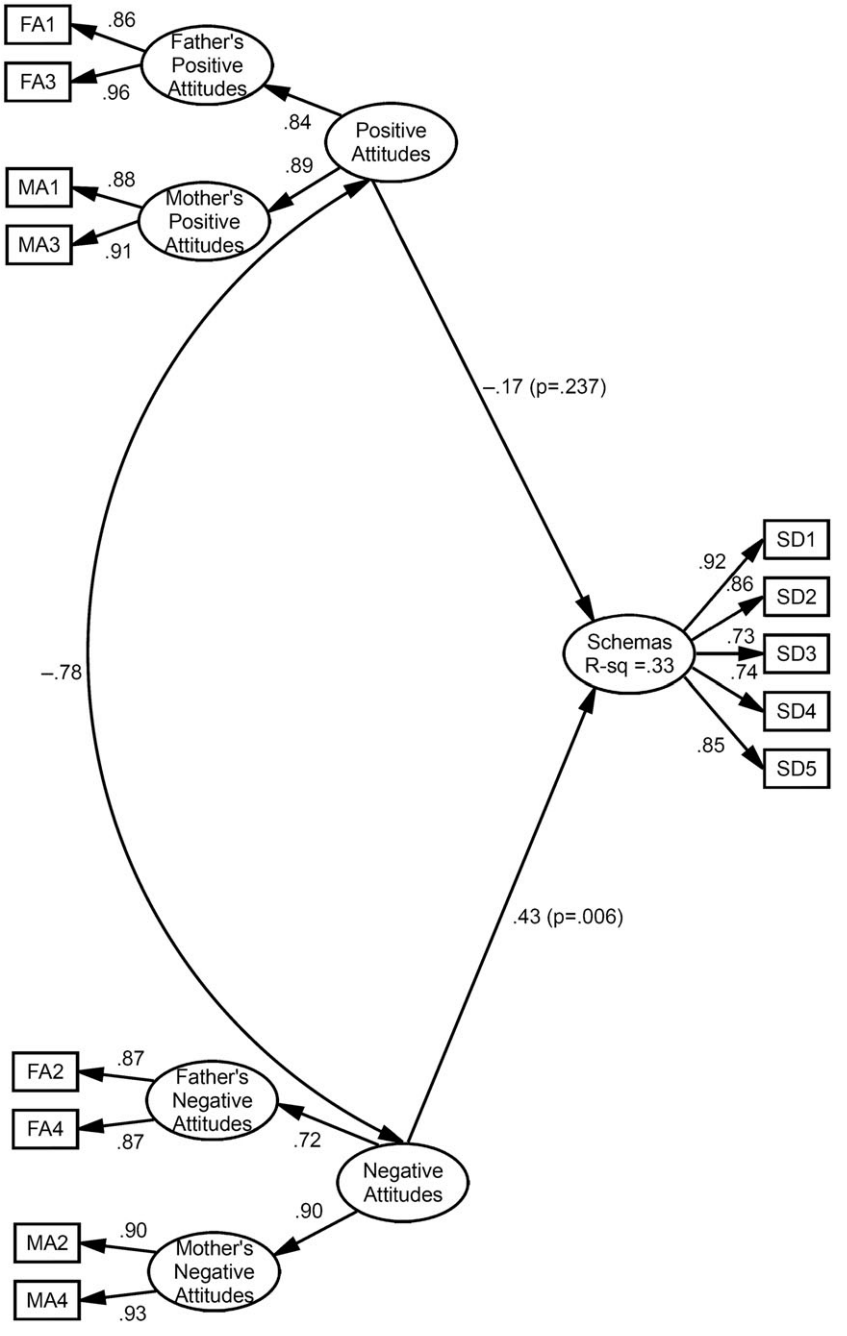

Figure 1. Model 1 – schemas explained by parental attitudes. *Parental attitudes*: FA, father attitude; MA, mother attitude; 1, acceptance; 2, over-demanding; 3, autonomy; 4, inconsistent. *Schemas*: SD, schema domain; 1, disconnection and rejection; 2, impaired autonomy and performance; 3, impaired limits; 4, other directedness; 5, over-vigilance and inhibition.

positive parenting styles and schemas is clearly weaker and does not reach a statistical significance level, although the direction of this relationship is in line with expectations. However, the goodness of fit statistics are weak and model is barely acceptable (RMSEA = 0.081; GFI = 0.904) (Hooper *et al.*, 2008; Iacobucci, 2010) (see Table 4).

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Table 2. Reliability and convergent validity of measures

Constructs of models	Reliability measures		Convergent validity
	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Schemas	0.911	0.916	0.690
Father's positive attitudes	0.889	0.918	0.848
Mother's positive attitudes	0.885	0.903	0.823
Mother's negative attitudes	0.911	0.939	0.885
Father's negative attitudes	0.870	0.897	0.813
Stabile temperament	0.605	0.659	0.492
Labile temperament	0.720	0.771	0.641

AVE > 0.5 suggest meeting convergent validity requirements.

Table 3. Discriminant validity of measures – Fornell–Larcker criterion

Constructs:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Schemas (1)	**0.830**						
Father's positive attitudes (2)	−0.358	**0.921**					
Mother's positive attitudes (3)	−0.441	0.423	**0.907**				
Mother's negative attitudes (4)	0.420	−0.200	−0.769	**0.941**			
Father's negative attitudes (5)	0.405	−0.665	−0.212	0.340	**0.902**		
Stabile temperament (6)	−0.559	0.296	0.221	−0.155	−0.288	**0.701**	
Labile temperament (7)	0.414	−0.218	−0.162	0.141	0.169	−0.751	**0.801**

Fornell–Larcker criterion data reported in the following way: numbers on matrix diagonal are square roots of AVE values, off-diagonal – correlations between constructs (Henseler *et al*., 2015).

Table 4. Fit indices for CFA and estimated models

Measures of fit	Reference values[a]	Estimates for CFA		Estimates for model	
		Initial	With dropped items	1	2
χ^2/d.f.	<2	6.196	3.571	3.604	1.861
p (for χ^2)[b]	>0.05 (n.s.)	0.000	0.000	0.000	0.000
GFI	>0.95	0.868	0.911	0.904	0.969
AGFI	>0.90	0.818	0.867	0.833	0.945
NFI	>0.95	0.623	0.768	0.785	0.911
TLI	>0.95	0.782	0.919	0.744	0.933
CFI	>0.95	0.826	0.941	0.829	0.956
SRMR	<0.08	0.081	0.040	0.166	0.079
RMSEA (90% CI)	<0.05	0.115 (0.108–0.121)	0.081 (0.072–0.090)	0.081 (0.069–0.094)	0.047 (0.032–0.060)
PCLOSE	>0.05 (n.s.)	0.000	0.000	0.000	0.626

[a]Hooper *et al*. (2008), 53–59.
[b]For larger samples is often unreasonable to have not significant p (Iacobucci, 2010; 90–98).
d.f., degrees of freedom; GFI, goodness of fitness index; AGFI, adjusted goodness of fit index; NFI, normed fit index; TLI, Tucker–Lewis index; CFI, comparative fit index; RMSEA, root mean square error of approximation; PCLOSE, p-value for test of close fit (testing the null hypothesis that the population RMSEA is no greater than 0.05); n.s., not significant.

Model 2

In view of Young's theoretical assumptions and the postulated hypotheses, another two explanatory variables were added to parenting styles: stable and labile temperament. This resulted in Model 2 (Fig. 2).

The obtained indicators of goodness of fit were satisfactory (Table 4). The percentage of explained schema variance increased to 59%. Stable temperament traits are directly related only to schemas, and the path coefficient was strongly negative (–0.40; $p = 0.000$). The labile

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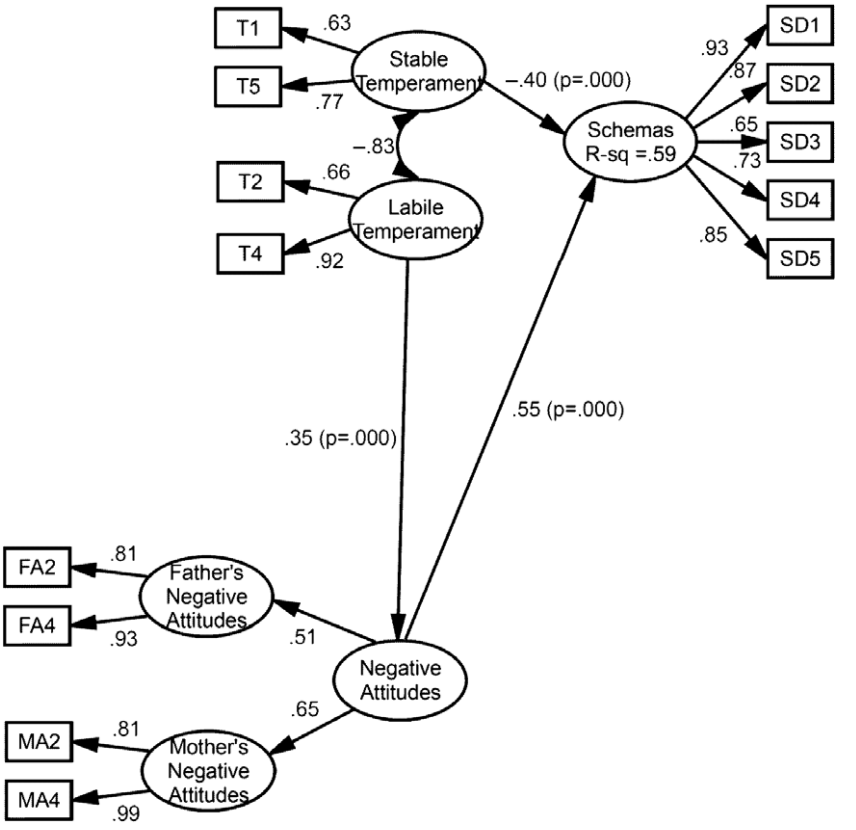

Figure 2. Model 2 – schemas explained by parental attitudes and temperament. *Parental attitudes*: FA, father attitude; MA, mother attitude; 2, over-demanding; 4, inconsistent. *Schemas*: SD, schema domain; 1, disconnection and rejection; 2, impaired autonomy and performance; 3, impaired limits; 4, other directedness; 5, over-vigilance and inhibition. *Temperament*: T1, briskness; T2, perseverance; T4, emotional reactivity; T5, endurance.

temperament traits were associated with negative parenting styles (0.35; $p = 0.000$), strengthening their relationship with schemas (0.55; $p = 0.000$). Positive parenting behaviours were not related to either schemas or temperament (path coefficients were insignificant), so they were removed from the final model.

The obtained results allow us to verify the previously made hypotheses:

Model 1 indicates that there is a positive (strengthening) correlation between the severity of schemas and negative parenting styles, while the connection with positive styles has a negative direction and its strength is weak. Model 2 also confirms the important role of negative parenthood for the severity of schemas, while positive parenting style is still irrelevant with regard to temperament. These results allow confirmation of the hypothesis that *parents' negative behaviours are more relevant for the schema intensity then positive ones.*

Model 2 confirms the role of the labile temperamental traits as enhancing negative parenting behaviours, which secondarily increase the severity of schemas. At the same time, these temperamental traits are not directly related to schemas. However, the stable temperament traits are not linked to any type of parenting behaviour, but they are directly and negatively related to the intensity of schemas. Thus, the hypothesis *the temperament is linked to the parents' behaviours but not directly to schemas* is only partially confirmed.

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Discussion

The main aim of this study was to examine the interrelations between one's temperament and the way of being parented during childhood in the context of schema severity. Results support Young's assumption that schemas develop not only via negative parenting, but they also need vulnerable, labile temperament. The two tested models show the interrelations for better understanding schema theory.

The first aim was to verify if schemas can be explained only by perceived style of being parented as a child. Some earlier studies partially confirmed such correlations. Usually, more severe schemas are connected to more negative and simultaneously less positive parents' behaviours (Dale *et al*., 2010; Harris and Curtin, 2002; Khajouei Nia *et al*., 2014; Thimm, 2010). Muris (2006) indicated that high levels of rejection, over-controlling, and anxiously protective behaviours, as well as low levels of acceptance and warmth are significantly related to the severity of EMS. The parenting styles in his study explained between 5 and 27% of the variance in the schemas, which is close to value obtained in Model 1 of the present study. However, this model does not confirm the role of positive parenting.

Similarly, after including temperament in the model (model 2), positive parenting is still not significant. Such insignificance of positive behaviours is worth considering. One possible reason may be the difference in tested participants. The studies mentioned above were conducted mainly in different clinical groups. In such cases, the schemas are usually stronger (Chodkiewicz and Gruszczyńska, 2018), which can be connected with more severe negative parenting (Sheffield *et al*., 2005). Highly critical, demanding or rejecting parents are rarely warm and accepting (Khajouei Nia *et al*., 2014; Plopa, 2008; Roe and Siegelman, 1963). The lack or small amount of positive behaviours and feelings received from parents is not good for a child and can lead to difficulties in functioning. However, typical parenting consists of different behaviours: parents are mainly accepting and supporting, but sometimes they can be critical, over-demanding or even rejecting. In this case schemas are weaker, because of positive attitudes towards a child. However, the child can remember mainly negative experiences because of their inconsistency with the positive parenting. Thus, positive parental attitudes may be non-important, if they are a typical parenting style, and only negative experiences become meaningful. On the other hand, Muris confirms the significance of positive parenting (lower acceptance – stronger schemas) in his study conducted on a non-clinical sample. It should be noted, however, that positive parenting in his study is significantly connected to schemas only in case of correlations method, while regression equations point to the role of rejection and over-controlling (Muris, 2006). These results are similar to those obtained in presented study.

The next aim of this research was to check the role of temperament. As hypothesized, based on the earlier studies of Muris (2006), Mairet *et al*. (2014) and Haugh *et al*. (2017), labile temperament features are significant for schema severity. Muris' study is the most similar to the presented research. He takes into account both parental rearing and temperament, and tested their significance for schema severity on a non-clinical sample. Both detrimental rearing and neuroticism explain up to 35% of the variance in most schemas (Muris, 2006). However, Muris does not explain interrelation between variables.

In the current study, two dimensions of temperament were tested: stable and labile. Stable features are connected directly to schema severity and have no significant connections with parental behaviours, either positive or negative. This may mean that in the event of negative parental styles, the stable characteristics of a child's temperament actually become a safeguard against the development of schemas. The child does not take a long time to overcome potential distress and easily copes with difficult emotions; temperamental endurance allows him/her to function effectively in adverse situations. Thus, the direct influence of stable characteristics can be explained as resistance to environmental stimuli and transferability

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between positive and negative experiences. It allows one not to constantly concentrate on negative emotions (Strelau *et al.*, 1995). It is in line with Young *et al.* (2003), that temperament can prevail over negative environment. The research of Epkins and Heckler (2011) and Verstraeten *et al.* (2009) suggests that strong temperament (e.g. extraversion) can be a protective factor against psychopathology symptoms.

If the labile characteristics of temperament prevail (perseverance and emotional reactivity in the models), the child tends to have strong, excessive and long-lasting reactions, which are mentally burdensome and exhausting for him/her. It is interesting that the labile temperament is connected to negative parenting, but not with schemas directly. This type of temperament can reinforce parents' negative behaviours. Such a child is usually anxious, emotional and insecure, and requires a lot of patience and care. For a parent with an inconsistent or demanding rearing style, or simply insecure of himself, a child with such traits will cause parenting difficulties and reinforce the behaviour characteristic of these parental styles. In turn, more intense negative parenting styles can enhance schemas. Besides, weak, reactive temperament enhances the importance of adverse parents' behaviour. Criticism, distrust or similar adverse parental reactions are experienced by the child more intensely, and, consequently, have a greater importance for him/her.

On the other hand, Muris (2006) found that for some schemas (e.g. defectiveness or incompetence) only neuroticism is a significant predictor, not detrimental parenting. However, it is difficult to imagine that temperament by itself could influence the type of beliefs about oneself.

The labile temperament is strongly associated with experience. Experiencing emotions alone seems to be not enough to form or reinforce a schema, but related to the situation (in this case, negative and generating the same emotional climate), by continuous processing and strong reaction (Strelau and Zawadzki, 1993), it is able to create an emotional and cognitive trace, which will have a significant part in creating schemas. Other studies also confirm this direction. Haugh and colleagues claim that research supports the assumption that the environment can override the child's temperament, but the evidence that the temperament can override the environment and produce schemas, and consequently, psychopathology, is rather weak (Haugh *et al.*, 2017). Hudson *et al.* (2011) and Rioux *et al.* (2016) have also obtained results confirming the moderating role of temperament between parental environment and psychopathological difficulties.

In conclusion, the presented results are in line with Jeffrey Young's theoretical assumptions concerning schema-forming factors (Young *et al.*, 2003). Stable, strong temperament can be a protective factor, while labile and weak features may intensify the negative parenting and reinforce experiencing it by the child. Temperament, as a relatively persistent feature, may play a similar role in adulthood, reinforcing one's emotions and feelings in the context of environment and maintain the schemas. Thus, it is important to assess the temperament for more effective schema therapy, both for better understanding the past, and for facing present difficulties by relieving the feeling of being unable to effectively cope. A labile, weak temperament should be treated as a risk factor for prolonged persistence of high-level schemas, while its stable features can be treated as protective factor.

Model 2 reflects these correlations and explains almost 60% of the variance in schema severity, which is a very high value, especially in the description of a non-clinical group. This is important information for therapists, as some of a patient's characteristics, such as temperament, are difficult or even impossible to change.

Limitations of the study

The presented study, however, has several limitations. First of all, the presence of difficult situations, including those related to violence in childhood, was not controlled. According to Young, they have by far the most important influence on the formation of schemas.

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Moreover, the conclusions are based on studies of a non-clinical group. On the one hand, this is a clear advantage, as it confirms the assumptions about the sources of schemas in people without disorders. On the other hand, however, we cannot be sure that in different clinical groups the correlations will be the same or at least similar, so the results should not be generalized to patient populations.

The participants in the study are also limited to a one-country group, which may be significant in the context of assessing parental behaviour; in other cultures these assessments may be completely different due to, for example, different standards of child-rearing. On the other hand, Young emphasises that it is not so much the objective behaviours of parents that are important as the perception of these behaviours by children.

Another important limitation of this study is the self-description method of measurement, and in the case of parental styles it is additionally a retrospective assessment. Adults who already have their children can judge their parents from a different perspective – unlike when they were children. Moreover, memories can be significantly distorted by time or emotions that cannot be verified (Sheffield *et al.*, 2005). A similar limitation applies to temperament – the measurement of the present state does not allow for an unambiguous conclusion about temperament in childhood, as these characteristics, although relatively stable, can be modified in ontogenesis (Strelau *et al.*, 1995; Strelau and Zawadzki, 1993). Such a research scheme was, however, adopted in similar studies (Calvete, 2014; Haugh *et al.*, 2017).

Explaining the intensity of schemas in terms of total score is a limitation on the interpretation of results, as it does not allow us to verify which parental behaviours in combination with which temperament characteristics are explained by individual schemas, or at least by their domains. However, Roe and Siegelman (1963) and Plopa (2008) indicate that parental behaviours are not isolated and that, to a greater or lesser extent, all are observed in typical families. In this study, it was not possible to evaluate more specific relationships. Therefore, the direction of further research should focus on the intensity and type of needs faced by a frustrated child rather than the parenting style. The above limitations also determine the direction of further studies.

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