The Schema Questionnaire: Investigation of Psychometric Properties and the Hierarchical Structure of a Measure of Maladaptive Schemas[1]

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Although schemas play a central role in cognitive conceptualizations of personality disorders, research devoted to the assessment of schemas has been scarce. This article describes the preliminary validation of a measure of schemas relevant to personality disorders. The Schema Questionnaire (SQ) was developed using five independent samples (N = 1,564). In study 1, factor analyses using a student sample revealed 13 primary schemas. A hierarchical factor analysis revealed three higher-order factors. In study 2, factor analyses using a patient sample revealed 15 primary schemas. The patient and student samples produced similar sets of primary factors which also closely matched the rationally developed schemas and their hypothesized hierarchical relationships (Young, 1991). The primary subscales were found to possess adequate test-retest reliability and internal consistency. In study 3, the SQ was found to possess convergent and discriminant validity with respect to measures of psychological distress, self-esteem, cognitive vulnerability for depression, and personality disorder symptoms.

KEY WORDS: schema; personality disorder; questionnaire validation; cognitive vulnerability.

Cognitive therapy has been applied to a wide range of psychological problems including depression (Beck, Rush, Shaw, & Emery, 1979), anxiety (Barlow, 1988; Rachman & Maser, 1988), eating disorders (Fairburn & Cooper, 1987; Hsu, 1990), and more recently, personality disorders (Beck, Freeman, & Associates, 1991; Freeman & Leaf, 1989). Cognitive therapy of personality disorders seeks to bring about symptomatic relief through the modification of underlying maladaptive cognitive structures. These underlying structures, or schemas, create distress through cognitive biases which result in the dysfunctional synthesis of environmental and intrapersonal data. Thus, identification of these underlying schemas is a critical component in the cognitive treatment of personality disorders (Beck et al., 1991).

Despite the central role that schemas play in cognitive conceptualization and treatment of personality disorders, few guidelines exist regarding schema identification and assessment. One exception is the work of Young (1990), whose schema-focused therapy includes the assessment of schemas within the treatment protocol. Young's schema-focused therapy is grounded in a conceptual framework which delimits (a) schema development and maintenance, (b) general schema characteristics, and (c) specific schemas and their hierarchical relationships.

Young (1990) proposed that schemas, or early maladaptive schemas (EMS), develop during childhood vis-à-vis relationships with significant caretakers. Once in place, the EMSs selectively filter for corroborating experience such that the schemas are extended and elaborated throughout the individual's lifetime. During childhood, an EMS is a means for the child to comprehend and manage the environment. In adulthood, the EMS outlives its limited utility and creates anxiety and/or depression when it is activated by situations relevant to that particular schema (e.g., the abandonment EMS is activated during real or perceived separations).

Despite their maladaptive nature, EMSs are self-perpetuating and highly resistant to change. Because the EMS rests at the core of the individual's self-concept, it is familiar, comfortable, and unconditional (cf. Swann, 1983). The unconditional nature of an EMS prevents realistic processing of schema-inconsistent information. At the cognitive level, the schema is maintained by magnifying information that confirms the schema, and negating or minimizing information that is inconsistent with the schema.

Young's (1990) schema theory is largely consistent with other schema theories (Beck, 1967; Segal, 1988). Beck, Segal, and Young each described schemas as stable and enduring structures which form the core of the individual's self-concept. Schemas distort information regarding the self and
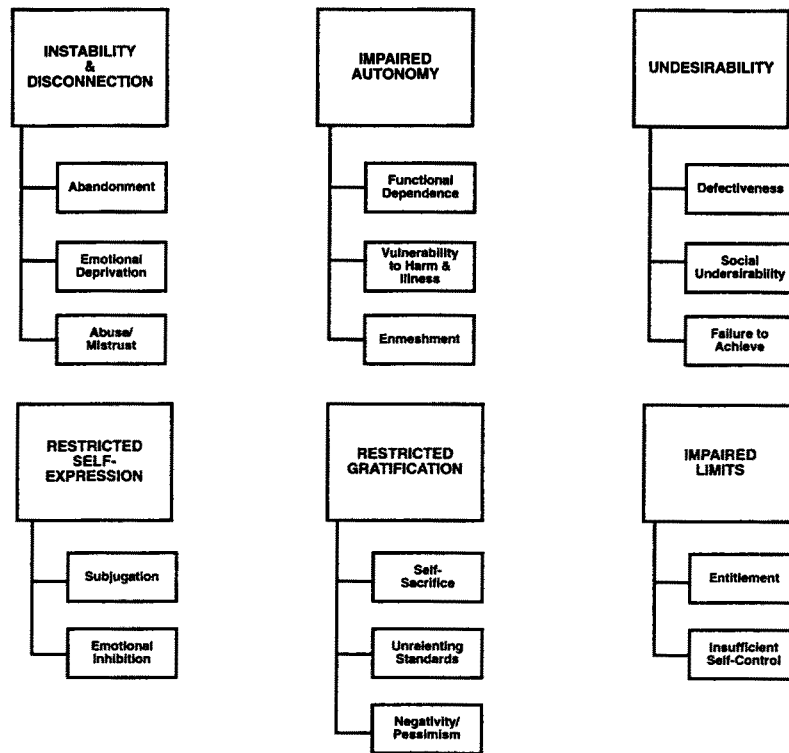
Fig. 1. Young's hierarchical model of early maladaptive schemas. Adapted from Young (1991).

the environment, which gives rise to negative automatic thoughts and subjective distress. However, one important theoretical difference is that EMSs are unconditional (e.g., "I am unlovable"), whereas Beck's underlying assumptions are conditional (e.g., "If I can please others all the time, I will be loved"). This suggests that EMSs are more frequently hypervalent compared to underlying beliefs which require that certain stressors or conditions are present.

Based on clinical experience with chronic and/or difficult psychotherapy patients, Young (1991) has identified 16 schemas grouped within six higher-order areas of functioning: instability/disconnection, impaired autonomy, undesirability, restricted self-expression, restricted gratification, and impaired limits (see Fig. 1).

The instability/disconnection domain describes the expectation that intimate relationships will not provide security, stability, or nurturance. There are three primary EMSs within this domain. *Abandonment* is the perception that significant others will be unable to provide emotional support or protection because they are believed to be emotionally unstable, unreliable, or because they may die imminently. *Abuse/Mistrust* is the expectation that others are abusive, humiliating, and manipulative. *Emotional Deprivation* is the expectation that one's needs for nurturance and affection will never be adequately met.

The domain of impaired autonomy describes expectations regarding one's ability to separate and function independently from others and includes three primary EMSs. *Functional Dependence* is the belief that one is unable to competently manage everyday responsibilities. *Vulnerability to Harm/Illness* is an exaggerated fear that disaster (e.g., natural, medical, financial) will strike at any time. *Enmeshment* is excessive emotional involvement with others due to the belief that at least one of the enmeshed individuals cannot survive, or be happy, without the constant support of the other.

The domain of Undesirability contains three primary EMSs which describe the expectation that one is different from others and undesirable in terms of physical attractiveness, social skills, moral integrity, or personality. *Defectiveness* is the belief that one is internally defective and fundamentally unlovable. *Social Undesirability* is the belief that one is isolated from others due to some outwardly undesirable feature (e.g., ugly, dull). *Failure to Achieve* is the belief that one is fundamentally inadequate relative to others and, therefore, destined to fail in areas of achievement (e.g., school, career, sports).

The domain of restricted self-expression contains two EMSs which describe excessive restriction or suppression of emotion. *Subjugation* is the perception that personal desires are unimportant compared to the preferences of others. *Emotional Inhibition* is the expectation that emotional expression will lead to negative consequences such as embarrassment or harm to others.

The domain of restricted gratification contains three EMSs which describe an excessive emphasis on work, responsibility to others, or the negative aspects of life, at the expense of happiness, natural inclinations, and optimism. *Self-Sacrifice* involves exaggerated expectations of duty and responsibility to others. *Unrelenting Standards* includes the expectation that one must meet unrealistically and impossibly high standards. *Negativity/Pessimism* is the expectation that one cannot prevent the negative aspects of life.

The domain of impaired limits consists of two EMSs which describe deficiencies in self-discipline and in setting emotional and interpersonal limits. *Entitlement* is the expectation that one should be able to act without regard for others. *Insufficient Self-Control* is the expectation that self-discipline is unimportant and that emotions and impulses require little restraint.

The Schema Questionnaire (SQ; Young, 1990; revised 1991) is a self-report inventory designed to measure the 16 primary EMSs (see Fig. 1). To date, the Schema Questionnaire has received no psychometric validation. We assessed the underlying factor structure of the SQ along with its reliability and validity. In studies 1 and 2, we conducted factor analyses as well as an analysis of the higher-order relationships of the EMSs. In study 3, discriminant and convergent validity analyses were conducted. Convergent validity of the SQ was tested in relation to self-esteem, psychological distress, and a measure of cognitive vulnerability for depression. It was hypothesized that EMSs would be negatively and significantly related to self-esteem, significantly related to overall distress, anxiety, and depression, and moderately but significantly related to cognitive vulnerability for depression. Although Young's EMSs are not isomorphic with the Diagnostic and Statistical Manual of Mental Disorders (3rd ed., rev.) (DSM-III-R; American Psychiatric Assocation, 1987) personality disorders, EMSs are theoretically related to personality disorders. It was expected that the SQ would be significantly related to DSM-III-R personality disorder traits.

STUDY 1. FACTOR ANALYSES WITH A STUDENT SAMPLE

Method

Subjects

The participants were 1,129 undergraduate students (423 males; 706 females) at a large southwestern university. Sample 1 consisted of 575 subjects (201 males; 374 females) and Sample 2 consisted of 554 subjects (222 males; 332 females).[3] All subjects were enrolled in introductory psychology classes and were participating for class credit. Subjects completed the Schema Questionnaire in groups of 40 to 50 people with the administration time being approximately 1 hour.

[3]The SQ's length presented problems with regard to sample size, sample population, and analytic strategy. Regarding sample size and analytic strategy, we felt that a cross-validation strategy with two samples > 500 was more compelling than one analysis on all 1,129 subjects. Although 500 is a low number of subjects for a principal-components analysis (PCA) on a 205-item scale, the PCA on all 1,129 subjects yielded virtually identical results to those presented with the split sample. With regard to sample type, the number of subjects required for a large-scale factor analytic study forced our use of undergraduates.

Measure

The Schema Questionnaire (SQ) (Young, 1990; revised 1991) is a 205-item self-report inventory designed to measure 16 EMSs (described above). Items for the SQ were generated by its author and other practicing therapists based upon clinical experience with chronic and/or difficult psychotherapy patients. Each item is rated using a 6-point scale (1 = completely untrue of me, 2 = mostly untrue of me, 3 = slightly more true than untrue, 4 = moderately true of me, 5 = mostly true of me, 6 = describes me perfectly).

Examination of the SQ revealed a small number of items (n = 12) which principally measured life events or symptoms. These items were removed from the analyses to avoid difficulties in interpreting the scale's construct validity (see Discussion for more on this issue).

Results

Factor Analyses

The SQ was factor-analyzed using the principal-components analysis (PCA) subroutine of SPSS's (1988) FACTOR procedure. We viewed our study as exploratory, as no previous studies have examined the SQ's psychometrics. Our decision to use PCA was in line with Nunnally's (1978, p. 418) recommendation that, with 20 or more variables in an exploratory analysis, PCA (with unities in the diagonals) is a reasonable analytic strategy. To enhance the interpretability of the factor solution, we chose an orthogonal rotation procedure (varimax; again consistent with Nunnally's recommendation, p. 418). The criteria for factor extraction were (1) Kaiser's (1961) criterion to retain factors with unrotated eigenvalues greater than 1; (2) a scree test (Cattell, 1966); and (3) the interpretability of resulting factor structures (Gorsuch, 1983), which involves examining solutions with different extraction criteria to determine the point at which trivial or redundant factors emerge (see, for example, Tobin, Johnson, Steinberg, Staats, & Dennis, 1991).

Seventeen factors, including 15 of the 16 hypothesized by Young (1991), emerged from the PCA on Sample 1. The Social Undesirability factor did not emerge; its items were scattered among the Failure to Achieve and Defectiveness factors. Two additional factors were produced, each a more specific version of factors hypothesized by Young. The first was Money Worries, comprised of items from the Vulnerability to Illness/Harm scale; the second was Loss of Control Fears, made up of items from the Emotional Inhibition scale.[4]

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[4]A more complete account of the data (e.g., loadings for all items on each factor, factors for student and patient samples) is available from the authors upon request.

To cross-validate the factor structure, the SQ was given to Sample 2. PCA with varimax rotation retaining the same number of factors as determined in the first sample was again used. These factors were compared with those obtained on the first sample using the coefficient of congruence (r_c; originated by Burt, 1941; developed by Tucker, 1951, and Wrigley & Newhaus, 1955; described by Cattell, 1978 p. 252), and Cattell's (1949) Salient Variable Similarity Index (s; see also Cattell & Baggaley, 1960; Cattell, Balcar, Horn, & Nesselroade, 1969; Cohen, 1969), using .10 as the criterion for salient variables (as recommended by Cattell, 1978 p. 257). Our use of two comparison indices is consistent with Cattell's (1978, p. 265) recommendations.

Items which loaded $\geq$ .30 on a given factor in both samples were assigned to that factor; with one exception (we deleted one item which loaded .30 on three separate factors), items which loaded on two or more factors were assigned to the factor on which they loaded most highly.

Of the 17 factors produced by the first analysis, 13 were clearly replicated in Sample 2. Table I displays the matrix of congruence coefficients (r_c) for the 13 replicated factors, as well as Salient Variable Similarity Indices (s) for same-factor comparisons (listed in parentheses on the diagonal). As seen in Table I, all 13 factors are, at least, moderately congruent, with r_c values ranging from .62 to .95 (average r_c = .86), and s ranging from .40 to .81 (average s = .63). While the values for s are somewhat lower than those for r_c, it should be noted that all values for s are significant at the .001 level (see Cattell, 1978, pp. 258-259, for significance testing for s; significance tests for r_c have not been developed).

The 13 replicated factors, with representative items, item loadings, and eigenvalues, are listed in Table II. Twelve of the first-order factors hypothesized by Young (1991) were identified and replicated in the factor analyses. Failure to Achieve retained most of its items but was relabeled Incompetence/Inferiority, which better describes the retained items. Several other factor labels were slightly modified in an attempt to capture a single core aspect of the schema (i.e., Abandonment/Instability = Abandonment; Abuse/Mistrust = Mistrust; Functional Dependence/Incompetence = Dependency; Vulnerability to Harm and Illness = Vulnerability; Enmeshment/ Undeveloped Self = Enmeshment; Defectiveness/Shame = Defectiveness; Self-Sacrifice/Overresponsibility = Self-sacrifice; Unrelenting/Unbalanced Standards = Unrelenting Standards; Insufficient Self-Control/Self-Discipline= Insufficient Self-Control). Of the four factors hypothesized by Young which did not emerge from the analyses, each merged into other factors with conceptual similarities. More specifically, Social Undesirability items loaded on Defectiveness; Social Isola-

tion/Alienation items loaded on Emotional Deprivation; Subjugation items loaded on Dependence; Entitlement items loaded on Insufficient Self-Control (refer to Fig. 1 and Table II). One factor which was not hypothesized by Young, Fear of Losing Control, was also replicated.[5]

Higher-Order Factor Structure of the SQ

To explore the structure of the higher-order factors, the two samples were combined, and correlations between subscales (derived from the factors established above) were computed. This intercorrelation matrix was factor-analyzed, again using PCA with varimax rotation and the extraction criteria outlined above.

The intercorrelation matrix of the derived scales, based on the combined sample of 1,129 subjects, is presented in Table III. The PCA of the intercorrelation matrix produced three distinct higher-order factors, which are displayed in Fig. 2. As can be seen there, each of the three higher-order factors produced by the analysis subsumes higher-order factors proposed by Young (1991). The first higher-order factor, labeled Disconnection, is similar to Young's Instability/Disconnection factor, but also includes Defectiveness, Emotional Inhibition, and Fear of Losing Control. This factor subsumes themes of abuse, neglect, and shame, and is reminiscent of abusive or neglectful family-of-origin environments (Young, 1990). The second higher-order factor produced by the present analysis, labeled Overconnection, includes all three first-order EMSs from Young's impaired autonomy factor, in addition to Incompetence/Inferiority. This factor includes debilitating dependency and vulnerability. The third higher-order factor, labeled Exaggerated Standards, includes the Self-Sacrifice and Unrelenting Standards EMSs from Young's Restricted Gratification factor. The Exaggerated Standards higher-order factor describes self-schemas that consist mainly of exaggerated standards including themes of self-deprivation and perfectionism.

The Insufficient Self-Control factor loaded highly (i.e., .60) and equally on all three higher-order factors.

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[5]A more complete account of the data (e.g., loadings for all items on each factor, factors for students and patients) is available from the authors upon request.

Table I. Congruence, Test–Retest, and Alpha Coefficients for the 13 Replicated Factors, with Salient Variable Similarity Indices Listed in Parentheses on the Diagonal[a]

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Incompetence/inferiority	.83 (.61)	.56	.81	.45	.44	.40	.19	.48	.54	.78	.32	.27	.10
2. Emotional deprivation	.39	.93 (.81)	.66	.46	.64	.42	.24	.54	.44	.51	.16	.38	.12
3. Defectiveness	.50	.68	.93 (.81)	.43	.55	.39	.24	.45	.52	.60	.24	.35	.14
4. Insufficient self-control	.38	.44	.46	.92 (.73)	.53	.31	.38	.51	.48	.56	.35	.30	.29
5. Mistrust	.30	.62	.54	.55	.93 (.76)	.35	.38	.54	.58	.48	.32	.33	.27
6. Self-sacrifice	.31	.35	.35	.25	.34	.95 (.69)	.38	.38	.39	.41	.19	.20	.05
7. Unrelenting standards	.10	.20	.20	.35	.36	.35	.94 (.72)	.22	.27	.20	.27	.18	.21
8. Abandonment	.37	.50	.47	.49	.58	.37	.28	.90 (.64)	.48	.57	.33	.15	.17
9. Enmeshment	.34	.43	.39	.42	.46	.41	.30	.50	.75 (.43)	.49	.68	.26	.29
10. Vulnerability	.45	.53	.40	.45	.56	.44	.34	.48	.30	.85 (.41)	.55	.18	.13
11. Dependency	.39	.49	.46	.44	.33	.33	.18	.46	.37	.49	.84 (.63)	.16	-.01
12. Emotional inhibition	.50	.30	.48	.36	.43	.33	.39	.25	.12	.39	.45	.75 (.55)	.03
13. Fear of losing control	.23	.27	.03	.22	.20	.15	.15	.26	.14	.18	.01	.22	.62 (.40)
Test–Retest Coefficients	.74	.82	.73	.66	.78	.74	.68	.67	.51	.57	.50	.74	.52
Alphas	.94	.94	.96	.92	.93	.91	.92	.91	.83	.88	.91	.86	.84

[a] All p values for Salient Variable Similarity Indices are significant to the .001 level. Interval between test and retest was 3 weeks.

Table II. The 13 Replicated Factors, with Eigenvalues, Representative Items, and Item Loadings

	Sample 1 loading	Sample 2 loading
Factor 1 — Incompetence/Inferiority (Eigenvalues: Sample 1 = 55.83; Sample 2 = 2.96)		
1. Most other people are more capable than I am in areas of work and achievement.	.79	.73
2. I'm not as intelligent as most people when it comes to work (or school).	.80	.70
3. I'm incompetent when it comes to achievement.	.79	.66
Factor 2 — Emotional Deprivation (Eigenvalues: Sample 1 = 11.54; Sample 2 = 8.25)		
1. Most of the time, I haven't had someone to nurture me, share themself with me, or care deeply about anything that happens to me.	.82	.73
2. In general, people have not been there to give me warmth, holding, and affection.	.76	.78
3. For the most part, I have not had someone who really listens to me, understands me, or is tuned into my true needs and feelings.	.78	.72
Factor 3 — Defectiveness (Eigenvalues: Sample 1 = 8.24; Sample 2 = 51.78)		
1. No one I desire would want to stay close to me if he/she knew the real me.	.68	.75
2. No man/woman I desire could love me once he/she saw my defects.	.64	.74
3. I am inherently flawed and defective.	.62	.60
Factor 4 — Insufficient Self-Control (Eigenvalues: Sample 1 = 7.75; Sample 2 = 6.98)		
1. I can't seem to discipline myself to complete routine or boring tasks.	.69	.60
2. Often I allow myself to carry through impulses and express emotions that get me into trouble or hurt other people.	.68	.56
3. I tend to overdo things, even though I know they are bad for me.	.66	.56

	Sample 1	Sample 2
Factor 5 — Mistrust (Eigenvalues: Sample 1 = 4.85; Sample 2 = 5.66)		
1. I am quite suspicious of other people's motives.	.71	.70
2. I often feel that I have to protect myself from other people.	.66	.62
3. Other people are rarely honest; they are usually not what they appear.	.64	.63
Factor 6 — Self-Sacrifice (Eigenvalues: Sample 1 = 4.25; Sample 2 = 4.50)		
1. I am a good person because I think of others more than of myself.	.70	.69
2. No matter how busy I am, I can always find time for others.	.69	.67
3. Other people see me as doing too much for others and not enough for myself.	.69	.60
Factor 7 — Unrelenting Standards (Eigenvalues: Sample 1 = 3.97; Sample 2 = 3.84)		
1. I try to do my best; I can't settle for "good enough."	.80	.79
2. I must be the best at most of what I do; I can't accept second best.	.78	.74
3. I strive to keep almost everything in perfect order.	.70	.75
Factor 8 — Abandonment (Eigenvalues: Sample 1 = 3.41; Sample 2 = 3.61)		
1. I find myself clinging to people I'm close to because I'm afraid they'll leave me.	.61	.75
2. I need other people so much that I worry about losing them.	.63	.70
3. I worry that people I feel close to will leave me or abandon me.	.60	.68
Factor 9 — Enmeshment (Eigenvalues: Sample 1 = 3.04; Sample 2 = 2.80)		
1. My parent(s) and I tend to be overinvolved in each other's lives and problems.	.71	.67
2. It is very difficult for my parent(s) and me to keep intimate details from each other, without feeling betrayed or guilty.	.60	.62
3. I often feel that I do not have a separate identity from my parents or partner.	.56	.58

Continued

Table II. (Continued)

|	Sample 1 loading	Sample 2 loading
Factor 10 — Vulnerability (Eigenvalues: Sample 1 = 3.04; Sample 2 = 3.12)		
1. I feel that a disaster (natural, criminal, financial, or medical) could strike at any moment.	.54	.54
2. I worry a lot about the bad things happening in the world: crime, pollution, etc.	.53	.49
3. I can't seem to escape the feeling that something bad is about to happen.	.51	.50
Factor 11 — Dependency (Eigenvalues: Sample 1 = 2.66; Sample 2 = 9.11)		
1. I need other people to help me get by.	.67	.60
2. I do not feel I can cope well by myself.	.64	.63
3. I believe that other people can take care of me better than I can take care of myself.	.62	.54
Factor 12 — Emotional Inhibition (Eigenvalues: Sample 1 = 2.09; Sample 2 = 2.52)		
1. I control myself so much that people think I am unemotional.	.54	.53
2. I find it hard to be warm and spontaneous.	.47	.50
3. People see me as uptight emotionally.	.46	.49
Factor 13 — Fear of Losing Control (Eigenvalues: Sample 1 = 1.88; Sample 2 = 2.38)		
1. I worry that I might seriously harm someone physically or emotionally if my anger gets out of control.	.51	.50
2. I feel that I must control my emotions or impulses or something bad is likely to happen.	.44	.42
3. I worry about losing control of my actions.	.35	.31
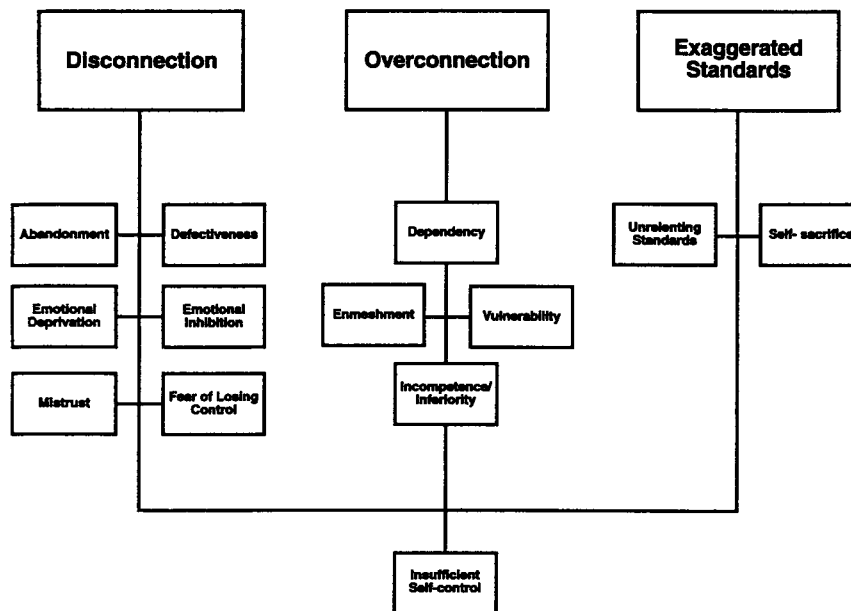
Fig. 2. Hierarchical relationship between primary and higher-order early maladaptive schemas.

Reliabilities of the Derived Subscales

A third sample of introductory psychology students (38 males; 47 females) was utilized to establish the test–retest reliability of the derived scales. Subjects completed the SQ at Session 1 and were reassessed 3 weeks later.

Test–retest coefficients and alpha internal consistency coefficients (Cronbach, 1951) of the 13 subscales were adequate, ranging from .50 to .82 (average r = .76) for test–retest, and .83 to .96 (average alpha = .90) for alpha. Test–retest coefficients and alphas are listed in the last two rows of Table I.

STUDY 2. FACTOR ANALYSIS WITH A PATIENT SAMPLE

Method

Subjects

The participants were 187 outpatients receiving treatment at a clinic in a large northeastern city. The mean age for the sample was 36.8 (SD = 10.9). Most subjects (91%) were white and about half (52%) were

female. The majority (72%) had received previous psychological treatment and relatively few (10%) had been hospitalized for psychiatric reasons. At intake, 61% received an Axis I diagnosis and 55% received an Axis II personality disorder diagnosis. Subjects completed the Schema Questionnaire during the initial sessions of treatment.

Measure

The 205-item SQ described in Study 1 was used.

Results

Factor Analyses

The SQ was factor-analyzed using a principal-components analysis with a varimax rotation. The criteria for factor extraction were the same as those described in Study 1.

Of the 16 factors hypothesized by Young (1991), 15 emerged from the PCA accounting for 53.7% of the total variance. Social Undesirability was the only hypothesized factor which did not emerge. The primary factors derived from this analysis matched results of the PCA using the first student sample. The main difference between the patient and student samples was that the schemas which merged in the second student sample (i.e., Social Isolation with Emotional Deprivation, Subjugation with Dependence, and Entitlement with Insufficient Self-Control), emerged as independent factors in the patient sample. This finding suggests that these schemas are sufficiently distinct in a clinical sample. The Fear of Losing Control schema which emerged from the student sample did not emerge in the patient sample. Because of the small sample size, these findings should be considered preliminary.

STUDY 3. CONVERGENT AND DISCRIMINANT VALIDITY

Convergent and discriminant validity of the SQ was tested in relation to conceptually relevant constructs such as self-esteem, psychological distress, personality disorder traits, and dysfunctional attitudes related to depression. It was expected that maladaptive schemas would be negatively associated with positive traits such as self-esteem and positively associated with distress, personality disorder traits, and dysfunctional attitudes.

Table III. Intercorrelation Matrix of the 13 Derived Subscales[a]

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Incompetence/Inferiority	1.0	—	—	—	—	—	—	—	—	—	—	—	—
2. Emotional Deprivation	.48	1.0	—	—	—	—	—	—	—	—	—	—	—
3. Defectiveness	.68	.73	1.0	—	—	—	—	—	—	—	—	—	—
4. Insufficient Self-Control	.41	.45	.44	1.0	—	—	—	—	—	—	—	—	—
5. Mistrust	.44	.64	.63	.55	1.0	—	—	—	—	—	—	—	—
6. Self-Sacrifice	.38	.36	.36	.30	.34	1.0	—	—	—	—	—	—	—
7. Unrelenting Standards	.17	.23	.21	.44	.36	.44	1.0	—	—	—	—	—	—
8. Abandonment	.47	.66	.60	.52	.67	.41	.26	1.0	—	—	—	—	—
9. Enmeshment	.40	.28	.39	.42	.41	.34	.29	.41	1.0	—	—	—	—
10. Vulnerability	.51	.46	.61	.45	.58	.44	.33	.55	.45	1.0	—	—	—
11. Dependency	.69	.47	.62	.44	.47	.38	.21	.57	.52	.57	1.0	—	—
12. Emotional Inhibition	.42	.57	.60	.36	.56	.34	.37	.40	.34	.47	.45	1.0	—
13. Fear of Losing Control	.36	.46	.49	.22	.52	.40	.36	.48	.28	.50	.39	.49	1.0

[a] All $ps < .001$.

Method

Subjects

The subjects were 181 undergraduates (96 male; 85 female) enrolled in an introductory psychology class who received course credit for participating in the study. Groups of 30 to 40 subjects completed a packet of self-report measures. The assessment lasted approximately 1.5 hours. Eighteen subjects scored above threshold on validity scales measuring random responding and lying and were excluded from analyses. The remaining 163 subjects were predominantly single (98% single, married 2%) and Caucasian (77% white, 12% Hispanic, 6% Oriental, 5% black). Their average age was 19.2 years (SD = 3.7, range = 17-54), with an average education level of 13.1 years (SD = 1.0).

Measures

Beck Depression Inventory (BDI). Level of depressive symptoms was assessed by the BDI (Beck et al., 1979; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), a 21-item self-report inventory. Each item is rated on a 0 to 3 scale, and inventory scores can range from 0 to 63. Although the BDI is not indicative of the full clinical syndrome of depression, it is a reliable and well-validated measure of depressive symptomatology (see Beck, Steer, & Garbin, 1988, for a review; see also Kendall, Hollon, Beck, Hammen, & Ingram, 1987). Beck et al. (1988) reported a mean alpha coefficient of .81 for use with nonpsychiatric populations.

Dysfunctional Attitudes Scale (DAS). The DAS (Weissman, 1979) is a 40-item self-report inventory that assesses excessive and rigid beliefs which are hypothesized to constitute a cognitive vulnerability factor for depression (Beck et al., 1979). Each item is rated on a 1 to 7 scale. The DAS has adequate internal consistency reliability and has been well validated (Dobson & Breiter, 1983; Kuiper & Olinger, 1986, 1989; see Kuiper, Olinger, & MacDonald, 1988, for a review).

Personality Diagnostic Questionnaire — Revised (PDQ-R). The PDQ-R (Hyler & Rieder, 1987) is a self-report instrument designed to assess DSM-III-R personality disorders (PD) including the self-defeating and sadistic PDs. Individual items are rated true/false to determine criteria for each PD. Criteria are summed to determine whether the threshold is met for diagnosis of each PD. The PDQ-R also contains three scales which assess for random responding and lying. The PDQ-R has been shown to have high sensitivity and moderate specificity for most Axis II disorders (Hyler,

Skodol, Kellman, Oldham, & Rosnick, 1990). Although the PDQ-R was originally intended for use with clinical populations, it has been shown to adequately assess personality traits in nonclinical samples (Johnson & Bornstein, 1991; Zimmerman & Coryell, 1990). For example, Zimmerman and Coryell found significant correlations between a structured clinical interview (Structured Interview for Personality Disorder; SIDP) and the corresponding dimensional scores on the PDQ-R for all PDs.

Positive Affectivity/Negative Affectivity Scale (PANAS). The PANAS (Watson & Clark, 1990; Watson, Clark, & Tellegen, 1988) includes 20 items, rated on a 1 to 5 scale, which assess positive affect (PA; the extent to which a person feels enthusiastic, active, and alert) and negative affect (NA; the extent to which a person experiences subjective distress such as anger, disgust, guilt, and fear). Scores for the PA and NA subscales can range from 10 to 50. Watson, Clark, and colleagues have extensively demonstrated the scale's validity (e.g., Watson, 1988; Watson, Clark, & Carey, 1988; Watson, Clark, & Tellegen, 1984). Watson, Clark, and Tellegen (1988) reported coefficient alphas in the range of .86 to .90 for PA, and .84 to .87 for NA.

Rosenberg Self-Esteem Questionnaire (SEQ). The SEQ (Rosenberg, 1965) is a 10-item scale that assesses global self-esteem. Items are rated on a 1 to 5 scale, and inventory scores can range from 10 to 50. Rosenberg reported a coefficient alpha of .92 for the SEQ. Silber and Tippett (1965) reported a test–retest reliability over a 2-week period of .85 and correlations of .56 between the SEQ and psychiatrists' ratings of self-esteem.

Schema Questionnaire. The 160-item SQ described in Study 1 was used.

Symptoms Checklist-90 — Revised (SCL-90-R). The SCL-90-R (Derogatis, 1983) is a 90-item self-report questionnaire assessing nine symptom dimensions: somatization (SOM), obsessive–compulsive (OC), interpersonal sensitivity (INT), depression (DEP), anxiety (ANX), hostility (HOS), phobic anxiety (PHOB), paranoid ideation (PAR), and psychoticism (PSY). Several global indices of distress can also be calculated including the General Severity Index (GSI), which is the summed ratings of each symptom. Each item is rated on a 5-point scale of distress which ranges from 0 (not at all) to 4 (extremely). Derogatis reported adequate internal consistency for each of the nine symptom dimensions (coefficient alphas range from .77 to .90) and good test–retest reliability over a 1-week period. Derogatis, Rickels, and Rock (1976) found high convergent validity for the nine symptom scales compared to related Minnesota Multiphasic Personality Inventory scales.

Results

Convergent and Discriminant Validity

Pearson correlations were computed between the SQ summed total score and eight selected criterion variables measuring overall psychological distress, anxiety, depression, self-esteem, and cognitive vulnerability for depression. To counter experimentwise error, the alpha level of significance was adjusted from .05 to .0014 according to Bonferroni correction.[6]

As hypothesized, there were significant correlations between the SQ total score and overall distress as measured by the GSI ($r = .67$, $p < .0001$) and the PANAS-NA ($r = .40$, $p < .0001$). There was also a near significant negative correlation between the SQ and the PANAS-PA ($r = -.26$, $p = .002$). The SQ was significantly correlated with measures of depression [BDI ($r = .59$, $p < .0001$); SCL-90-R DEP subscale ($r = .63$, $p < .0001$)], and anxiety (SCL-90-R ANX subscale ($r = .47$, $p < .0001$). Following our prediction, the SQ was significantly correlated with the DAS ($r = .60$, $p < .0001$). The SQ was also significantly and negatively associated with self-esteem as measured by the SEQ ($r = -.26$, $p = .001$).

We also examined the independent relationship between each SQ subscale and psychological distress. Separate stepwise regression analyses were conducted using (a) the GSI, (b) the BDI, and (c) the ANX subscale of the SCL-90-R as dependent variables. The SQ subscales, DAS, and SEQ were the independent variables. The DAS was included as an established measure of cognitive vulnerability for depression. The SEQ was included because self-esteem is presumed to be a stable self-attribute related to, but conceptually independent from, psychological distress.

The results of the stepwise regression analyses are presented in Table IV. Variables were allowed to enter the model if their partial F exceeded 4.0 and were removed if their partial F fell below this threshold.

With the GSI as the dependent variable, 4 of 15 possible regressors entered the equation. Vulnerability entered first and accounted for 38% of the variance ($p < .01$). Dependency entered next and added 10% more to the model ($p < .01$). Insufficient Self-Control added 6%, followed by the DAS which added an additional 1% to the model (all $ps < .01$). Overall, the model accounted for a substantial proportion of the variance (55%).

[6]Comparisons are not independent tests. A more conservative estimate is derived by dividing the standard alpha level by the total number of comparisons made (i.e., .05/36, .05/169).

When the BDI was used as the dependent variable, two regressors entered the model. Dependency entered first and accounted for 27% of the variance ($p < .01$). Defectiveness entered second and added 6% more to the model ($p < .01$). Overall, this model accounted for a moderate proportion of the variance (33%).

The analysis using the Anxiety subscale of the SCL-90-R resulted in three regressors entering the equation. Vulnerability entered first and accounted for 28% of the variance ($p < .01$) followed by Incompetence/Inferiority, and Emotional Inhibition, each adding 3% to the model (all $ps < .01$). These three regressors accounted for a moderate proportion of the overall variance (34%).

The PDQ-R was used as the criterion measure to assess the convergent validity of the SQ. Although the PDQ-R and SQ are not intended to measure isomorphic constructs, we expected significant correlations between measures of similar constructs. A correlation analysis between the total SQ score and the sum of all 13 PDQ-R criterion scores was used to test the overall strength of assocation between EMSs and maladaptive personality traits. This correlation was highly significant ($r = .71$).

Normative information regarding the SQ in groups displaying personality disorder traits was obtained by taking a median split of the summed PDQ-R dimensional score (high: $M = 39.5$, $SD = 8.1$; low: $M = 19.5$, $SD = 5.7$). The high-PDQ-R group exhibited significantly greater pathology compared to the low-PDQ-R group on each of the major clinical criterion variables (all $ps < .0001$). Scores of the high-PDQ-R group are consistent with those seen in psychiatric populations and indicate a significant degree of psychological distress (BDI: $M = 10.0$, $SD = 8.2$; GSI raw score: $M = 1.0$, $SD = 0.5$; SCL-ANX: $M = 1.04$, $SD = 0.7$; PANAS-NA: $M = 26.2$, $SD = 7.8$; DAS: $M = 94.1$, $SD = 21.7$; SEQ: $M = 23.6$, $SD = 9.1$). Table V displays means and standard deviations for the SQ total and subscale scores with subjects scoring high and low on the PDQ-R. As can be seen in Table V, high-PDQ-R subjects scored significantly higher on each of the SQ subscales.

DISCUSSION

Factor analyses largely matched the rationally derived primary EMSs proposed by Young (1990, 1991). Analysis of our student sample revealed 12 factors originally proposed by Young. The one factor which was not proposed by Young, Fear of Losing Control, represents an interesting refinement of the previously hypothesized Emotional Inhibition EMS. In a nonclinical population, the Fear of Losing Control EMS appears to represent a separate entity from general Emotional Inhibition, and, as such, should be assessed differentially.

Table IV. Stepwise Regression Analyses of the SQ Subscales Predicting Psychological Distress $(n = 163)$[a]

	r	R	R^2	R^2 change	df	F
GSI						
Significant predictors						
Vulnerability	.61	.61	.38	.38	1, 162	85.6
Dependency	.59	.69	.48	.10	2, 162	65.4
Insufficient Self-control	.55	.73	.54	.06	3, 162	54.6
DAS	.52	.75	.55	.01	4, 162	44.6
BDI						
Significant predictors						
Dependency	.52	.52	.27	.27	1, 162	60.7
Defectiveness	.52	.58	.33	.06	2, 162	40.3
ANX						
Significant predictors						
Vulnerability	.53	.53	.28	.28	1, 162	64.3
Incompetence/Inferiority	.40	.56	.31	.03	2, 162	36.7
Emotional Inhibition	.42	.58	.34	.03	3, 162	26.8

[a] SQ = Schema Questionnaire; SCL-90-R = Symptoms Checklist-90 — Revised; r = simple correlation; R = multiple correlation; R^2 = variance accounted for; GSI = SCL-90-R Global Symptom Index; BDI = Beck Depression Inventory; ANX = SCL-90-R Anxiety; DAS = Dysfunctional Attitudes Scale.

Table V. Means and Standard Deviations of the SQ and SQ Subscale Scores for Subjects Scoring Low and High on the PDQ-R (n = 163)[a]

PDQ-R		TOT	INC	ED	DEF	INSC	MT	SS	US	AB	EN	VUL	DEP	EI	FLC
								SQ							
Low	M	283.6	13.0	22.9	30.9	39.1	27.5	43.3	42.3	14.1	9.2	12.4	16.1	8.3	4.4
(n = 84)	(SD)	(53.4)	(3.4)	(7.4)	(7.8)	(10.7)	(8.2)	(11.7)	(13.3)	(5.0)	(3.2)	(3.5)	(4.5)	(3.9)	(2.2)
High	M	378.1[c]	18.2[c]	31.7[c]	45.8[c]	51.8[c]	38.9[c]	49.4[b]	49.4	21.4[c]	13.4[c]	17.2[b]	22.5[c]	11.1[c]	7.2[c]
(n = 79)	(SD)	(83.9)	(8.1)	(11.6)	(17.6)	(13.9)	(12.8)	(12.8)	(14.8)	(8.9)	(6.2)	(6.5)	(10.1)	(5.2)	(4.0)

[a]SQ = Schema Questionnaire; PDQ-R = Personality Diagnostic Questionnaire — Revised; TOT = SQ summed total score; INC = Incompetence/Inferiority; ED = Emotional Deprivation; DEF = Defectiveness; INSC = Insufficient Self-Control; MT = Mistrust; SS = Self-Sacrifice; US = Unrelenting Standards; AB = Abandonment; EN = Enmeshment; VUL = Vulnerability; DEP = Dependency; EI = Emotional Inhibition; FLC = Fear of Losing Control.
[b]$p < .01$.
[c]$p < .001$.

In the nonclinical sample, the four other hypothesized EMSs merged onto factors in conceptually meaningful ways. Specifically, Social Undesirability items loaded on Defectiveness, perhaps tapping feelings of social defectiveness. Social Isolation/Alienation items loaded on Emotional Deprivation, suggesting a too fine-grained distinction between feeling emotionally isolated or alienated and emotionally deprived. Subjugation items loaded on Dependency, suggesting that subjugation is an extreme form of dependency. Finally, Entitlement/Self-Centeredness items loaded on Insufficient Self-Control, suggesting that excessive self-centeredness represents one aspect of poor self-control.

Factor analysis of our patient data revealed 15 of the 16 proposed EMSs. Social Undesirability was the only proposed EMS which did not emerge. The fact that Social Undesirability did not emerge in any of the analyses suggests that it should not be considered as a conceptually distinct scale. The three factors which emerged as independent factors in the patient sample (i.e., Subjugation, Entitlement, Social Isolation) may represent more extreme schemas which infrequently occur in a nonclinical population. For example, we might speculate that many individuals may exhibit some dependency characteristics, but relatively few individuals should exhibit pronounced subjugation characteristics.

The hierarchical factor analysis conducted with the student sample condensed the higher-order factors proposed by Young (1991). The higher-order factor Disconnection appears to reflect pathology which results from a sense of disconnection and defectiveness. This cluster of schemas describes disconnected individuals who feel defective and alienated from others. These individuals may be emotionally inhibited with considerable fear of losing control of their emotions and behavior. The validity analyses indicate that individuals with this cluster of EMSs, in particular the Defectiveness EMS, may be vulnerable to depression.

The Overconnection EMS appears to represent pathology which results from enmeshment. This cluster of schemas appears to describe individuals who feel incompetent, vulnerable, and excessively dependent. The validity analyses suggest that individuals who feel both dependent and defective are at risk for depression. On the other hand, individuals who feel incompetent/inferior and vulnerable are particularly at risk for experiencing anxiety.

The third factor, Exaggerated Standards, describes EMSs which pertain to exaggerated standards of behavior. This cluster of schemas describes individuals who are excessively focused on achievement or on self-sacrifice. Whereas the Unrelenting Standards EMS describes individuals who place themselves before others and are only satisfied when they are "Number One," the Self-Sacrifice EMS describes individuals who are most

comfortable doing for others and who feel guilty when they focus any attention on themselves. The Insufficient Self-Control factor loads equally on all three higher-order factors. This suggests that faulty or insufficient self-control is a common thread to each of the EMS clusters.

Study 3 indicated that the SQ was significantly related to both Axis I and Axis II symptomatology. The EMSs accounted for a considerable proportion of the variance in predicting psychological distress. These analyses also indicated a divergence between EMSs associated with depression (Dependency, Defectiveness) versus anxiety (Vulnerability, Inferiority/Incompetence). The association between the Dependency and Defectiveness EMSs and depression is consistent with cognitive (e.g., Abramson, Metalsky, & Alloy, 1989), self-esteem (e.g., Arieti & Bemporad, 1980), and dependency (e.g., Beck, 1983) theories of depression, whereas the association between vulnerability and anxiety is consistent with Beck's conceptualization of vulnerability being a core feature of anxiety disorders (Beck & Emery, 1985).

One of the main limitations of the present study was the use of nonclinical student samples. The number of subjects needed to factor-analyze a scale of considerable length made this a practical decision on our part. The smaller patient sample was utilized to test the generalizability of the student sample findings. Overall, we found a high level of convergence between the student and patient samples. This is not particularly surprising because the factor structure derived from the student sample closely resembled the rationally derived scale. We also assume that these EMSs exist on a continuum with nonclinical populations exhibiting similar but less pronounced cognitive biases compared to clinical samples. However, the findings derived from the clinical sample should be viewed as tentative until they can be replicated with larger clinical samples.

Another limitation is the use of the PDQ-R for assessing DSM-III-R personality disorders. The PDQ-R has been criticized for producing a high number of false positive diagnoses (Hyler et al., 1990). To avoid this problem, we have considered the PDQ-R as a measure of personality disorder symptomatology rather than a definitive instrument for establishing a DSM-III-R diagnosis. Research investigating the relationship between EMSs and DSM-III-R personality disorders should rely more heavily on structured clinical interviews, such as the SCID-II (Spitzer et al., 1987), when diagnostic specificity is critical.

We also recognize the limitations of the sole use of self-report for the assessment of schemas. Although the self-report assessment of schemas is practical and common (Dohr, Rush, & Bernstein, 1989; Hammen, Marks, Mayol, & DeMayo, 1985; Kwon & Oei, 1992), it has its limitations. Segal (1988) noted that paper-and-pencil measures can define a self-schema descriptively but cannot provide evidence regarding the structural relationships

among elements in a self-structure. Information processing tasks, such as the Stroop task, provide an alternative methodology for assessing schematic processing (Segal & Vella, 1990). We have recently collected preliminary data which assess the relationship between the SQ and response latencies on a computerized version of a single word presentation Stroop task. The Stroop task was modified to include color-naming of schema-specific words. We found that subjects scoring high on the SQ, compared to those scoring low on the SQ, showed significantly greater Stroop interference for schema-specific words. These data provide preliminary evidence that the SQ factors may also be assessed by information processing paradigms. Ultimately, we hope to complete a larger study which examines the multimodal assessment of maladaptive schemas through information processing tasks and physiological measures such as those used in the study of anxiety disorders (Foa & McNally, 1986; Mathews & MacLeod, 1985).

The issue of the SQ's overlap with constructs such as current symptomatology and life stress deserves further mention. We have addressed this issue by deleting SQ items which we believed to be heavily contaminated by symptom or stress loadings. We acknowledge that some remaining SQ items may overlap with symptom or stress constructs. The validity coefficients in Study 3 should be interpreted in this context. It should be noted, however, that schemas which are frequently hypervalent would be expected to be closely related to symptoms and stress.

A final consideration involves our choice of exploratory PCA as a data-analytic strategy. We chose an exploratory approach because SQ psychometrics have not been developed. Future work would benefit from the use of confirmatory procedures, such as latent variable modeling.

The present study indicates that the SQ can be a promising tool for research and clinical use. In its present state, the questionnaire allows for the identification of a wide array of EMSs. This broad coverage of schemas allows clinicians to focus cognitive treatment on particular dysfunctional schemas, and to reassess for schematic change over the course of therapy. Because our findings indicate some differences between nonclinical and clinical samples, we recommend the use of slightly different questionnaires depending upon the population being assessed. The present study also points to several interesting lines of research involving EMSs. Analyses indicate that the questionnaire is highly associated with psychological distress. However, prospective studies are needed to evaluate whether the SQ measures a cognitive vulnerability to developing Axis I symptomatology. Further studies are also required to explore the relationship between DSM-III-R personality disorders and EMSs. In particular, treatment outcome studies are necessary to determine that effective schema-focused treatment mitigates personality disorder symptomatology.

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