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## Childhood psychopathology and development of adult schizotypal symptoms

Fagel, S.S.A.A.

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**Author:** Fagel, Selene Sofia Alexandra Agnes

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# Chapter 2



# How schizotypal symptoms affect objective and subjective quality of life in a clinical cohort

Fagel, S.S.A.A., Swaab, H., Van Engeland, H., & De Sonneville, L.M.J. How the presence of schizotypal symptoms affects objective and subjective quality of life: A follow-up of child and adolescent psychiatric patients into adulthood. *Revised manuscript under review.*

## Abstract

It is unclear how subclinical symptoms of schizophrenia spectrum pathology impact on Quality of Life in psychiatric patients. It is examined how adult schizotypal symptoms affect objective QoL and subjective QoL (OQoL;SQoL) in a clinical cohort. 690 patients of the Department of Child and Adolescent Psychiatry of the University Medical Centre Utrecht, the Netherlands, were reassessed after 15.0 years ( $SD=5.3$ ) for adult schizotypal symptoms using Schizotypal Personality Questionnaire-Revised. Associations between schizotypal symptoms, distinctive schizotypal symptoms and OQoL were analyzed using (M)ANOVA. The strength of the relation between schizotypal symptoms and seven domains of SQoL were examined by computing Pearson's bivariate correlations. Partial correlations were computed between each symptom dimension and domain of SQoL while statistically controlling for the other two symptom dimensions. Each schizotypal dimension unfavorably affected each domain of OQoL. Negative schizotypal symptoms had the largest effect on OQoL. Impoverished SQoL, in particular dissatisfaction with social contacts, was predominantly influenced by negative schizotypal symptoms. The findings show that the extent of schizotypal symptomatology in psychiatric patients already characterized by a decreased level of QoL even further modifies QoL in an unfavorable way. Negative schizotypal symptoms most strongly affected OQoL and SQoL.

## Introduction

Literature so far has extensively reported about the very unfavorable impact of schizophrenia spectrum pathology on the patients' Quality of Life (QoL). Schizophrenia spectrum pathology is composed of multiple conditions that are characterized by distortions of cognitive and perceptual reality, collectively known as positive symptoms, interpersonal withdrawal (negative symptoms), and disorganized speech and behavior (disorganized symptoms) (Liddle, 1987; Suhr & Spitznagel, 2001). Several studies, probing into how impoverished QoL relates to these heterogeneous manifestations of schizophrenia spectrum pathology, reported consistent results, in that general schizophrenia spectrum pathology (Awad, 1992; Awad, Hogan, Vorungati, & Heslegrave, 1995) and negative symptoms in particular seem to have a more profound influence on QoL than positive or disorganized symptoms (Browne et al., 1996; Corrigan & Buican, 1995; Fitzgerald et al., 2001; Law et al., 2005; Malla & Payne, 2005; Meltzer, Burnett, Bastani, & Ramirez, 1990; Orsel, Akdemir, & Dag, 2004; Wilson & Cleary, 1995; Xiang, Weng, Lueng, Tang, & Ungvari, 2007). By discriminating between Objective QoL (OQoL), i.e., evaluating the patients' living conditions (Corrigan & Buican, 1995), and Subjective Quality of Life (SQoL), i.e., evaluating the patient's appraisal of these conditions (Corrigan & Buican, 1995), studies have reported that each of the symptom domains is associated with reduced OQoL and SQoL (Cohen & Davis, 2009), but again negative symptoms are specifically associated with worse OQoL (Cohen & Davis, 2009; Fitzgerald et al., 2001; Fitzgerald et al., 2003; Narvaez, Twamley, McKibbin, Heaton, & Patterson, 2008) and SQoL (Cohen & Davis, 2009).

There is, however, a caveat. Since previous studies have only included typically developing controls for comparison and since psychiatric disorders such as depression (Ishak et al., 2011), ADHD (Danckaerts et al., 2010), and psychopathology in general (Lehman, 1983) have commonly been found to unfavorably affect OQoL and SQoL, the question remains unanswered in what way the presence of schizophrenia spectrum symptomatology in psychiatric patients specifically relates to QoL. The answer to this question would carry relevant information for treatment protocols aimed to improve QoL in patients with schizophrenia spectrum symptomatology.

Moreover, as only a minority of individuals at risk to develop schizophrenia spectrum pathology will show manifest illness (Chapman, Chapman, Kwapil, Eckblad, & Zinser, 1994; Meehl, 1962; Tsuang, Stone, Tarbox, & Faraone, 2002), it is considered more clinically relevant to investigate how subclinical schizophrenia-like abnormalities, i.e., schizotypal symptoms, affect OQoL and SQoL in a cohort of patients who all sought

psychiatric help during child age.

The aim of this study was to examine how adult schizotypal symptoms affect OQoL and SQoL in psychiatric patients. It is hypothesized that elevated schizotypal symptoms, in particular negative symptoms, are associated with worse OQoL and SQoL.

## *Method*

### Participants and procedure

This study is part of a longitudinally prospective study designed to evaluate both global and clinical outcomes in adulthood of patients, referred during 1984 to 2004 (T1), to the Department of Child and Adolescent Psychiatry at the University Medical Centre of Utrecht (UMCU), the Netherlands. Patients meeting the following criteria were approached for participation during 2006 to 2010 (T2): (1) aged 18 years or younger at T1, (2) aged 18 years or older at T2, (3) presence of axis I diagnosis based on Diagnostic Statistical Manual (DSM) criteria of the American Psychiatric Association (1980, 1987, 1994), (4) no axis II DSM diagnosis (1980, 1987, 1994) of mental retardation ( $IQ < 70$ ) at T1, and (5) no axis I DSM diagnosis before or at T1 with child psychotic disorder, schizophrenia or any other psychotic disorder, bipolar disorder or dissociative disorder. There were 2690 non-retarded patients who were suitable candidates for follow-up. They were sent a letter informing them about the aims of the study, asking them to participate in the study. The patients who did not respond were contacted by phone when they could be traced in the public phone registry, to explain the aim of the study and to encourage participation. A total of 2000 patients declined participation, resulting in a final sample consisting of 690 (306 male and 384 female) adult patients with age 12.2 years ( $SD=3.9$ ) at T1, and reassessed at the age of 27.2 years ( $SD=5.6$ ) at T2. The intelligence profile of the group was within the normal range with a total IQ of 103.4 ( $SD=14.2$ ), a performance IQ of 104.5 ( $SD=15.6$ ), and a verbal IQ of 103.1 ( $SD=14.2$ ). The ethical principles of the Helsinki Declaration (Schluklenk, 2001) were followed and ethical approval was obtained from the Medical Ethical Committee of the University Medical Centre of Utrecht (number 05-319/K). Table 1 describes the juvenile DSM diagnostic categories of participants.

**Table 1. Juvenile DSM diagnostic categories of participants**

<b>Juvenile DSM diagnostic category</b>	<b><i>n</i></b>
Affective disorders	151
Attention-deficit and disruptive behavior disorders	147
Eating disorders	138
Pervasive Developmental Disorders	62
Other conditions that may be a focus of clinical attention	39
Deferred diagnoses axis I or II	25
Other disorders of infancy, childhood, or adolescence	23
Somatoform disorders	22
Sexual and gender identity disorders	20
Tic disorders	18
Adjustment disorders	18
Elimination disorder	10
Communication disorder	8
Learning disorders	7
Substance related disorders	1
Sleeping disorders	1

## Non-participants

Participants and non-participants were compared on age, gender distribution and IQ. Proportionally more participants appeared to be females (55.7 % female participants versus 38.5% female dropouts;  $\chi^2(1,2690)=61.986, p<0.001$ ). The participants were slightly older at T1 (M=12.1; SD=3.9) than the dropouts (M=11.6; SD=4.0;  $F(1,2669)=11.695, p=0.001, \eta_p^2=.004$ ), but did not differ on age at T2 (M=27.2; SD=5.6 vs. M=27.0; SD=5.6). Participants had a higher intelligence than dropouts, but differences were small for total IQ (M=104.2; SD=14.3 vs. M=100.3; SD=14.0;  $F(1,995)=15.157, p<0.001, \eta_p^2=.015$ ), verbal IQ (M=103.2; SD=14.1 vs. M=99.2; SD=14.2;  $F(1,995)=16.048, p<0.001, \eta_p^2=.016$ ), and performance IQ (M=104.5; SD=15.7 vs. M=101.6; SD=14.2;  $F(1,995)=7.247, p=0.007, \eta_p^2=.007$ ).

## Measurement instruments

### Adult schizotypal symptoms

Adult schizotypal symptoms were measured using the revised Schizotypal Personality Questionnaire-Revised (SPQ-R; Vollema & Hoijtink, 2000; Raine, 1991). The SPQ-R is a self-report measure of schizotypal symptoms, modeled on the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1987) criteria for schizotypal personality disorder (Raine, 1991). In the study of Raine (1991) a chi-square analysis indicated a significant association between 'group membership' based on scores on the SPQ (high/low) and clinical diagnosis (yes/no) of schizotypal personality disorder ( $\chi^2=7.3, p=0.007$ ). The point-biserial correlation between diagnosis of schizotypal personality disorders and SPQ scores was also significant ( $r=.60, p=0.001$ ; Raine, 1991). These analyses demonstrate that high scores on the SPQ are indicative of a diagnosis of schizotypal personality disorder. Factor analytical studies have revealed three schizotypal dimensions, i.e., positive, negative, and disorganized symptoms (Raine, 1994, Vollema & Hoijtink, 2000). This factor structure has been found to be invariant to gender, ethnicity, religion, and social background (Reynolds, Raine, Mellinger, Vanables, & Mednick, 2000), and it parallels the factor structure obtained in schizophrenia patients (Raine, 2006). Vollema, Sitskoorn, Appels & Kahn (2002) suggested that the SPQ may be regarded as an indicator of the (genetic) vulnerability for schizophrenia, because it is sensitive to gradient levels of schizophrenia, proportional to the risk for schizophrenia associated with the degree of kinship with schizophrenic family members. The SPQ has high internal reliability (0.91), test-retest reliability (0.82), convergent validity (0.59 to 0.81), discriminant validity (0.63), and criterion validity, 0.68; Raine, 1991). All items endorsed "yes" are scored 1. Higher scores on the SPQ-R indicate higher levels of schizotypal symptoms, with a range of 0 to 100 for the SPQ total



score, 0 to 38 for the SPQ positive factor, 0 to 43 for the SPQ negative factor, and 0 to 19 for the SPQ disorganized factor.

## Objective and Subjective Quality of Life

Objective and Subjective quality of life were evaluated using a questionnaire concerning global and clinical outcome in adult life which was developed at the Department of Child and Adolescent Studies of Leiden University and consisted of two sections. The first section examined self-reported objective measures of QoL (OQoL): educational level, marital status, living arrangement, mental health care, medication use, and employment. Educational level was defined as the highest level of education attained by the patient, with scores ranging from two ((pre)primary education) to seven (second stage of tertiary education). The level of education of the patients was reported on the basis of the Standaard Onderwijs Indeling (SOI-2006; Central Bureau for Statistics, 2006), which is based on the International Standard Classification of Education (ISCED; 1997). The second section examined self-reported Subjective measures of QoL (SQoL), i.e., the respondents' satisfaction with life in seven areas that are generally considered as basic to QoL, i.e., living arrangement, employment or education, physical health, partner-relationship, social contacts, mood, and future perspective. These domains were scored on a six-item scale, ranging from very dissatisfied to very satisfied. Higher scores are indicative for higher levels of SQoL and OQoL. Self-reported measures of OQoL and SQoL were used since patients have been shown to assess their QoL accurately and consistently (Becchi, Rucci, Placentino, Neri, & De Girolamo, 2004; Reynolds, et al. 2000), and self-reported measures of QoL have been found to be more valid than clinician-reported QoL measures (Narvaez, et al., 2008).

## Statistical analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences 21.0 (SPSS Inc, Chicago, IL, USA). To examine how adult schizotypal symptoms affect different categories of OQoL, univariate and multivariate analysis of variances ((M)ANOVA) were performed with total schizotypal symptoms and factor scores as dependent variables respectively, and each OQoL domain as between subjects factor. For specific within-domain group by group comparisons on total schizotypal symptoms, post-hoc

analyses were performed using Bonferroni correction for multiple testing. Partial eta squared ( $\eta_p^2$ ) was used to estimate effect sizes, with  $\eta_p^2 \sim 0.03$  representing a weak effect,  $\eta_p^2 \sim 0.06$  representing a moderate effect and  $\eta_p^2 \geq 0.14$  representing a significantly large effect (Stevens, 2002). The strength of the relation of total schizotypal symptoms with all seven domains of SQoL were examined by computing Pearson's bivariate correlations ( $r_s$ ) (small effect size:  $r_s = 0.1-0.23$ ; medium:  $r_s = 0.24-0.36$ ; large:  $r_s \geq 0.37$ ) (Cohen, 1992). In addition, to determine the unique contribution of each schizotypal symptom scale to each SQoL domain, partial correlations were computed between each symptom dimension and each of the seven domains of SQoL while statistically controlling for the other two symptom dimensions. Alpha was set at .01.

## Results

### Adult schizotypal symptoms and OQoL

Higher levels of adult schizotypal symptoms were significantly associated with lower levels on each of the six OQoL domains. i.e., Employment ( $F(3,686)=15.473, p<0.001, \eta_p^2=.063$ ), Marital status ( $F(1,688)=22.220, p<0.001, \eta_p^2=.031$ ), Living arrangement ( $F(2,687)=14.805, p<0.001, \eta_p^2=.041$ ), Mental health care ( $F(1,688)=68.702, p<0.001, \eta_p^2=.091$ ), Medication use ( $F(2,687)=34.472, p<0.001, \eta_p^2=.091$ ), and Educational level ( $F(5,684)=9.986, p<0.001, \eta_p^2=.068$ ). Post-hoc univariate analyses revealed significant higher levels of schizotypal symptoms for the following groups: social security recipients in comparison with employed patients ( $p<0.001$ ) and patients who were in training ( $p<0.001$ ), single patients in comparison with patients who were married or living together with their partner ( $p<0.001$ ), institutionalized patients in comparison with patients who lived together with their parents or other family members ( $p<0.001$ ) or who were self-reliant ( $p<0.001$ ), patients who were currently receiving mental health care in contrast to patients who did not ( $p<0.001$ ), patients who were currently using medication compared to patients who did not ( $p<0.001$ ) or in the past ( $p<0.001$ ), patients who only received (pre) primary or secondary education in comparison with patients who fulfilled first stage tertiary education ( $p<0.001$ ), and second stage tertiary education ( $p<0.001$ ), and patients who only received upper secondary education in comparison with second stage of tertiary education. (See Table 2).

**Table 3. Schizotypal symptomatology and Subjective QoL (n=690)**

Subjective QoL domain	Total schizotypal symptoms		Positive schizotypal symptoms		Negative schizotypal symptoms		Disorganized schizotypal symptoms	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Living arrangement	-.222	<.001	-.012	.752	-.175	<.001	.040	.296
Employment or education	-.338	<.001	-.062	.104	-.157	<.001	-.045	.237
Physical health	-.305	<.001	-.123	.001	-.083	.029	-.038	.326
Partner-relationship	-.332	<.001	.087	.022	-.222	<.001	-.124	.001
Social contacts	-.394	<.001	.138	<.001	-.402	<.001	.009	.820
Mood	-.434	<.001	-.028	.457	-.305	<.001	.011	.772
Future perspective	-.418	<.001	.038	.318	-.283	<.001	-.080	.037

**Table 4. Negative schizotypal traits and Subjective QoL domains (n=690)**

Subjective QoL domains	Ideas of reference	Excessive social anxiety	No close friends	Constricted affect	Suspiciousness
	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
Living arrangement	-.197*	-.203*	-.187*	-.178*	-.320*
Employment or education	-.192*	-.314*	-.252*	-.248*	-.308*
Physical health	-.215*	-.261*	-.155*	-.187*	-.312*
Partner-relationship	-.241*	-.299*	-.291*	-.284*	-.288*
Social contacts	-.239*	-.427*	-.446*	-.364*	-.341*
Mood	-.338*	-.412*	-.366*	-.321*	-.393*
Future perspective	-.264*	-.404*	-.356*	-.369*	-.360*

\**p*<.001

## Total schizotypal symptoms and SQoL

Pearson bivariate correlations between Total schizotypal symptoms and each of the seven SQoL domains separately revealed that Total schizotypal symptoms negatively affected SQoL in each of the seven domains (see Table 3).

## Schizotypal symptom dimensions and OQoL

The MANOVAs of the three schizotypal symptom dimensions for each of the OQoL domain separately, revealed that higher levels of schizotypal symptoms were significantly associated with lower OQoL, i.e., Employment, ( $F(3,686)=5.392, p<0.001, \eta_p^2=.023$ ), Marital status, ( $F(3,686)=12.994, p<0.001, \eta_p^2=.054$ ), Living arrangement ( $F(3,685)=7.594, p<0.001, \eta_p^2=.032$ ), Mental health care ( $F(3,686)=22.957, p<0.001, \eta_p^2=.091$ ), Medication use ( $F(6,686)=11.670, p<0.001, \eta_p^2=.049$ ), and Educational level ( $F(15,684)=5.726, p<0.001, \eta_p^2=.040$ ). In general, effect sizes were highest for negative schizotypal symptoms and lowest for positive schizotypal symptoms. The univariate analyses revealed that higher levels of positive, negative and disorganized schizotypal symptoms corresponded with worse outcome on each OQoL domain, i.e., patients showing highest levels of schizotypal symptoms were the ones who were social security recipients, were single, institutionalized, who currently used medication or received mental health care, or who had a lower Educational level. (See Table 2).

## Schizotypal symptomatology and SQoL

Partial correlations between each schizotypal symptom dimension and each SQoL domain revealed that negative schizotypal symptoms were significantly correlated with all SQoL domains, except physical health, indicating that level of negative symptoms were inversely related to SQoL (see Table 3). These associations were particularly substantial for dissatisfaction with social contacts, mood, and patient's future perspective. Positive symptoms showed significant but opposite relations with SQoL domains, i.e., satisfaction with social contacts being positively associated and satisfaction with physical health being negatively associated. Disorganized schizotypal symptoms were only significantly correlated with dissatisfaction with partner-relationship. (See Table 3).

**Table 2. Schizotypal symptomatology and Objective QoL**

	Total schizotypal symptoms					Positive schizotypal symptoms			
	<i>n</i>	M	SD	<i>p</i>	$\eta_p^2$	M	SD	<i>p</i>	
<b>Employment</b>									
In training	76	24.2	15.9			8.4	6.4		
Employed	482	22.4	17.5			7.5	6.2		
Sheltered employed	14	30.4	23.0			11.4	10.4		
Social security recipient	118	34.9	21.3	<.001	.063	11.3	8.7	<.001	
<b>Marital Status</b>									
Single	371	28.0	18.7			8.9	7.0		
Married or living together	319	21.3	18.1	<.001	.031	7.7	6.9	.027	
<b>Living Arrangement</b>									
Self-reliant	495	23.3	19.0			8.1	7.1		
With parents or other family members	154	26.3	16.7			8.3	6.2		
Institutionalized	41	39.2	16.1	<.001	.041	12.3	7.0	.001	
<b>Mental health care</b>									
Yes	150	35.6	20.6			11.9	7.9		
No	540	21.9	17.1	<.001	.091	7.4	6.4	<.001	
<b>Medication use</b>									
At this moment	130	36.1	20.2			11.8	8.1		
None, but medication use in the past	106	26.2	17.5			8.9	6.5		
None	454	21.4	17.2	<.001	.091	7.2	6.4	<.001	
<b>Educational level (SOI)</b>									
SOI 1+2: (Pre) primary education	46	33.3	18.5			9.5	6.3		
SOI 3 : Lower secondary education	119	31.1	19.1			10.3	7.4		
SOI 4 : Upper secondary education	322	25.2	19.6			8.6	7.2		
SOI 5 : Post-secondary non-tertiary education	6	32.7	14.4			15.3	7.4		
SOI 6 : First stage of tertiary education	128	19.6	15.9			7.0	6.4		
SOI 7 : Second stage of tertiary education	69	16.7	11.9	<.001	.068	5.3	4.2	<.001	

Negative schizotypal symptoms					Disorganized schizotypal symptoms				
$\eta_p^2$	M	SD	$p$	$\eta_p^2$	M	SD	$p$	$\eta_p^2$	
	11.1	8.0			4.5	4.1			
	10.6	9.1			4.3	4.5			
	13.6	9.2			5.5	5.5			
.045	16.7	10.0	<.001	.059	6.9	5.3	<.001	.042	
	13.4	9.5			5.6	4.9			
.007	9.8	9.0	<.001	.037	3.8	4.3	<.001	.037	
	10.9	9.4			4.4	4.6			
	12.9	9.2			5.21	4.6			
.020	18.0	8.1	<.001	.036	9.0	4.4	<.001	.053	
	16.9	10.2			6.9	5.1			
.071	10.3	8.7	<.001	.082	4.2	4.5	<.001	.054	
	17.0	9.8			7.3	5.2			
	12.7	9.3			4.6	4.4			
.065	10.0	8.8	<.001	.082	4.1	4.4	<.001	.064	
	16.1	9.4			7.7	5.3			
	14.6	9.5			6.2	5.0			
	12.0	9.9			4.6	4.7			
	15.0	9.2			2.3	2.1			
	8.8	7.8			3.8	4.2			
.051	8.1	7.0	<.001	.063	3.3	3.5	<.001	.063	

## Negative schizotypal traits and SQoL

Further exploration of the different negative schizotypal traits, i.e., ideas of reference, social anxiety, no close friends, constricted affect, and suspiciousness (together representing the negative schizotypal symptom dimension), and SQoL showed that all of the traits were negatively associated with all SQoL domains ( $p < 0.001$ ). Highest correlations were found for satisfaction with social contacts, future perspective, and mood ( $.264 < r < .446$ ). (See Table 4).

## Discussion

In contrast to earlier studies that have mainly evaluated QoL in psychiatric patients in comparison to typically developing controls, the present follow-up study focused on the question whether and how the presence of schizotypal symptoms influences the level of OQoL and SQoL in a sample of patients representing a wide spectrum of psychiatric disorders. It was found that each schizotypal dimension, i.e., positive, negative and disorganized schizotypal symptoms, unfavorably affected each domain of OQoL. Impoverished QoL, and in particular dissatisfaction with social contacts, was predominantly influenced by negative schizotypal symptoms.

## Objective QoL

Elevated levels of positive, negative and disorganized schizotypal symptomatology corresponded with less favorable outcomes across all OQoL domains: i.e., increased dependency on institutionalized residence, unemployment or institutionalized employment, lower education, more need for mental health care and more use of medication. In addition to findings of earlier studies that have reported about the very profound impact of schizotypal symptomatology on OQoL, referenced against the QoL of normal controls only (Cohen & Davis, 2009), the present results add to these findings, by showing that the extent of schizotypal symptomatology in a sample of psychiatric patients already characterized by a decreased level of QoL, even further modifies the QoL in an unfavorable way. It was also shown that the extent of negative schizotypal symptoms had the largest effect on OQoL. This is consistent with reports about negative schizotypal symptoma-

tology being associated with lower OQoL (Fitzgerald et al., 2001; Fitzgerald et al., 2003; Narvaez et al., 2008).

## Subjective QoL

Interestingly, impoverished SQoL was almost exclusively accounted for by negative, and not positive or disorganized schizotypal symptoms, and this unfavorable influence extended to all domains of SQoL. The finding that in psychiatric patients, SQoL is inversely related to the severity of negative symptomatology, supports the findings of earlier studies that focused on individuals with schizophrenia or schizoaffective disorder (Browne et al., 1996; Huppert et al., 2001) or first episode psychosis (Law et al., 2005; Wegener et al., 2005) and typically developing controls (Cohen & Davis, 2009), and again emphasizes the effect that negative symptoms have on a person's SQoL.

The unfavorable impact of negative schizotypal symptoms is further illustrated by the post-hoc evaluation of the association between total schizotypal symptoms and SQoL, after adjusting for the influence of negative schizotypal symptomatology. In that case, Total schizotypal symptoms remain only negatively associated with satisfaction with physical health ( $r(687)=-.136, p<0.001$ ), and with social contacts in the opposite direction ( $r(687)=.129, p<0.001$ ).

One explanation for the unfavorable effect of negative schizotypal symptomatology on SQoL might be found in Calman's gap (Calman, 1984), i.e., that a person's SQoL can be equivalent to the narrowness of the gap between a person's expectations and achievements and how this gap is influenced by a person's affective state, i.e., the affective fallacy (Schwarz & Clore, 1983). There are two ways of keeping Calman's gap narrow: being successful in arriving at one's aims on the one hand, and lowering one's level of aspiration on the other hand (Katschnig, 2000). As a consequence of a person's affective state, it has been found that depressed patients experience their own well-being, social functioning and living conditions more worse than they appear to be for an independent observer (Kay, Roth, & Beamish, 1964), while, for example, manic patients rate their SQoL as very good (Katschnig, 1997). In accordance to Calman's gap, patients scoring high on negative symptoms might therefore have higher personal expectations rather than being less successful. Since this is especially relevant to target specific interventions, this issue needs further investigation.



## Social contacts

Dissatisfaction with social contacts showed strongest associations with schizotypal symptomatology and particularly pertained to patients scoring high on negative schizotypal symptoms. This result is in accordance with the finding of Cohen & Davis (2009) who reported that negative symptoms showed the most striking unique contributions to QoL and in particular to those domains associated with social relationships. Surprisingly, severity of positive schizotypal symptoms was associated with more satisfaction with social contacts. The nature of this distinctive association between schizotypal symptoms and dissatisfaction with social contacts is unclear. Although suggestive, this might be a consequence of a reduced need of social contacts. In accordance with Malmberg's suggestion (Malmberg, Lewis, David, & Allebeck, 1998), patients scoring high on negative schizotypal symptomatology might experience problems in approaching and initiating contact rather than having a lack of interest in relationships. More in-depth investigation of adult negative schizotypal traits indeed showed that (in order of the magnitude of the effect) excessive social anxiety, more constricted affect and higher levels of suspiciousness were especially associated with more dissatisfaction with social contacts. Whether patients scoring high on positive schizotypal symptomatology either experience less difficulty in approaching and initiating contact or have a lack of interest in relationships is unclear and needs further investigation.

## Strengths and limitations

The number of 690 subjects in the final sample is considered to be substantial. Nevertheless, inherent to this long follow-up period, this study suffered from attrition as this number constitutes nearly 30% of the original sample. However, the background variables of the participants were in majority quite similar to that of the non-participants, except for their slightly higher intelligence. Further, since the mean age of participants was 27.2 ( $SD=5.6$ ) years, not all subjects may have passed the (full) period of risk for schizophrenia spectrum pathology, the level of schizotypal symptoms might therefore be underestimated. In addition, the screening by self-report does carry some limitations, as compared with interviews or observations. Self-report questionnaires might not ensure sufficient sensitivity and specificity for specific schizotypal signs such as an odd

or guarded appearance, an expression of aloofness, or poor eye contact, and restricted affect (Kendler, 1988). In future studies, direct observation of these specific symptoms might be a way to address these additional questions. Besides these limitations, the current study suited the purpose to illustrate how the presence of schizotypal symptoms affects OQoL and SQoL in a sample consisting of only subjects who sought psychiatric help at child age.

## Conclusion

The present findings show that the extent of schizotypal symptomatology in psychiatric patients, who are already characterized by a decreased level of QoL, even further modifies QoL in an unfavorable way. Negative schizotypal symptoms most strongly affected OQoL and SQoL.

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