

Social Adversity and Psychosis: The Mediating Role of Cognitive Vulnerability

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Background: Social adversity is a risk factor for psychosis, but the translating mechanisms are not well understood. This study tests whether the relationship between social adversity and psychosis is mediated by cognitive vulnerability in the form of low perceived social rank, negative schemas related to self and other, and loneliness and whether the putative mediations are specific to psychosis or are largely explained by depression. **Methods:** The study was a survey in a community sample ($N = 2350$) from Germany ($n = 786$), Indonesia ($n = 844$), and the United States ($n = 720$). Mediation path analysis with structural equation modeling was used to test for the specificity of the hypothesized paths to psychosis controlling for depression. **Results:** Social adversity had a significant medium to large effect on positive ($R^2 = .20$) and negative symptoms ($R^2 = .38$). Social rank, negative schemas, and loneliness significantly mediated the relationship between social adversity and negative symptoms and the models explained a large amount of the variance ($R^2 = .43-.44$). For positive symptoms, only negative schemas were a significant mediator ($R^2 = .27$). **Discussion:** The results emphasize the role of social adversity in psychosis and support the assumption that cognitive vulnerability is a relevant translating mechanism as postulated by the social defeat hypothesis and cognitive models of psychosis. This underlines the relevance of the clinical practice of targeting beliefs in cognitive interventions for psychosis. It also indicates that targeting cognitive vulnerability in people experiencing social adversity could be a promising approach to prevention.

Key words: social adversity/etiology/childhood trauma/bullying/trauma/social exclusion/prevention

Introduction

Studies with varying designs carried out in different contexts have repeatedly shown social adversity (SA)

to be a major risk factor for psychosis. Experiences of SA associated with psychosis and its persistence include childhood trauma,^{1,2} migration,³ having a minority sexual status,⁴ being bullied in childhood,⁵ having a low socioeconomic status,⁶ experiencing discrimination,⁷ having a small social network and low social support,⁸ and being exposed to high levels of expressed emotion by families or confidants.⁹ Moreover, many of these experiences are also predictive of psychotic experiences at a subclinical level¹⁰ and in patients with nonpsychotic disorders.¹¹ For example, childhood trauma has been shown to be a risk factor for psychotic experiences in children¹² and adults,¹³ which again are known to predict psychotic disorders in later life.^{14,15}

Although the relationship between SA and psychosis is well established, the translating psychological mechanisms from SA to the emergence of psychotic symptoms are not well understood. Identifying such processes would provide us with targets to develop preventive psychosocial interventions that may reduce the number of psychotic cases traceable to SA (eg, 22% of psychotic cases can be traced to migration¹⁶).

One possible translating mechanism that has been proposed is social defeat,¹⁷ a concept that originates from animal experimental research. Rodents exposed to chronic social stress (eg., by moving them into a cage with a dominant rodent) exhibit behavioral markers of schizophrenia such as deficits in exploration and motivation, similar to negative symptoms, and fear of other rodents, similar to paranoia.^{18,19} Investigating social defeat in humans is more complex as the behavioral signals are less obvious and the appraisal component needs to be taken into account. A construct that closely resembles social defeat in humans and appears to be a good way of operationalizing social defeat is the appraisal of being low in social rank,²⁰ which has been found to be significantly associated with psychotic symptoms^{21,22} and to trigger paranoid

beliefs.²³ Thus, we expect social rank to mediate the association between SA and positive and negative symptoms of psychosis.

Other potential mediators between SA and psychotic symptoms are global negative beliefs about the self and others. Cognitive models of psychosis have emphasized that negative schemas, particularly those related to the self, are relevant to the development of psychotic symptoms.^{24–26} In support of these models, numerous studies find both positive and negative symptoms of psychosis to be associated with negative schemas about the self,^{27,28} and some have also found negative schemas about other people to be relevant.²⁹ Furthermore, self-esteem has been shown to mediate the effect of social exclusion on psychotic symptoms³⁰ and negative beliefs about the self and others to mediate the link between childhood adversity and psychotic symptoms.³¹

A third potential mediator that is intuitively linked to some of the SA associated with psychosis (eg, small networks, discrimination) is loneliness, which is defined as a subjective appraisal of social isolation along with feelings of sadness.³² Indeed, it has been shown that being a bully victim in adolescence predicts loneliness in young adulthood.³³ Moreover, loneliness was related to psychotic symptoms in first-episode psychotic patients³⁴ and in a community sample (Jaya et al, unpublished data).

To sum up, there is an evidence-based rationale to expect social rank, negative beliefs about self and others, and loneliness to result from an accumulation of adverse social experiences and to mediate the known association of SA on both positive and negative symptoms of psychosis. However, both SA³⁵ and the proposed mediators—social rank,³⁶ negative schemas,³⁷ and loneliness³⁸—are also predictive of depression. Moreover, depression is strongly associated with both positive³⁹ and negative⁴⁰ symptoms of psychosis, which needs to be taken into account to ascertain the specificity of translator mechanisms to psychosis.

Building on previous work from our group showing a strong association between SA and psychosis (Jaya and Lincoln, unpublished data), the present study tests the hypothesis that perceived low social rank, negative schemas, and loneliness mediate the effect of SA on both positive and negative symptoms. We also hypothesize that such associations are not fully explicable by co-occurring depression.

Finally, it is important to consider that findings based on a narrow single subpopulation, such as people from white, educated, industrialized, rich, democratic countries, often do not generalize to other subpopulations.⁴¹ A problem of generalization is particularly likely when the impact of social factors is a core focus of the study. Thus, in order to increase generalizability, the proposed mediation models were tested in a large community sample from 3 countries located in different continents with distinct social and political systems: Germany, Indonesia, and the United States.

Methods

Participants and Procedure

The multinational survey (part of the data set from this multinational survey has been used to study the basic association of SA and psychosis [Jaya and Lincoln, unpublished data]). The present study continues this work by investigating putative mediators of the association) targeted participants by posting the survey in Crowdfunder and on other websites (eg, social networking websites and internet forums, particularly forums on the topic of mental health disorders and schizophrenia). Similar to Amazon MTurk, Crowdfunder is a crowdsourcing website on which users can participate in a study in exchange for financial compensation. The inclusion criteria were agreement with the consent statements and age above 18 years. Of the initial 2501 survey entries, 151 were excluded due to duplicate entries and inconsistent answers. The final sample included 2350 participants of whom 720 completed the English, 786 the German, and 844 the Indonesian version of the survey. Part of the data set from this multinational survey has been used to study the basic association of SA and psychosis (Jaya and Lincoln, unpublished data). The present study continues this work by investigating putative mediators of the association.

Measures

The translation and back-translation and cultural adaptation of measures was conducted by native Germans, British, and Indonesian according to established guidelines.⁴²

Positive and negative symptoms were measured with the frequency scales for positive symptoms (20 items) and negative symptoms (18 items) from the Community Assessment of Psychic Experiences (CAPE).⁴³ Frequency of symptoms experienced during the past 4 weeks was rated by participants on 4-point Likert scales from never to nearly always. The German and English versions demonstrate good validity and reliability.^{44,45}

Depression was measured with the 9-item Patient Health Questionnaire-9 (PHQ-9) that is based on the DSM-IV criteria for depression⁴⁶ and thus measures all relevant symptoms of depression. It has been shown to have good reliability and validity in large representative population sample⁴⁷ and measurement invariance among different ethnic groups.⁴⁸ Items were answered according to the past 4 weeks on 4-point Likert scale from not at all to nearly every day.

Bullying victim experiences in childhood and adulthood were measured with a bullying victimization questionnaire.⁴⁹ The frequency and duration of bullying were assessed with 6 items. The possible total score for bullying victim experiences ranged from 0 to 5.

Child abuse experiences before the age of 16 years were measured with a self-report questionnaire that was based on a semistructured interview from the NEMESIS study.⁵⁰ Participants were asked if they ever experienced

emotional, psychological, physical, or sexual abuse (yes or no) according to a given definition that was presented (eg, emotional abuse: “This means for example that people at home did not listen to you, that your problems were ignored, that you had the feeling of not being able to find any attention or support”) and to rate the frequency of the experience on a 6-point Likert scale.

Discrimination experiences were assessed with items modified from the NEMESIS study.⁷ This measure contains 2 subscales: minority status and perceived discrimination. Minority status was measured with 5 statements that can be ticked if they are applicable. There was a statement each for having a minority sexual orientation, having a physical disability, belonging to an ethnic minority group, belonging to a minority religion, and having a visible physical condition (eg, being obese). Thus, the total score for minority status ranges from 0 (no minority status) to 5 (minority status in each of the 5 domains). Perceived discrimination was measured with 6 dichotomous (yes/no) items (eg, Have you ever been discriminated due to having a minority sexual orientation or gender identity?) related to age, sex, sexual orientation, physical disability, religion, and visible physical conditions, with the total score accordingly ranging from 0 to 6.

Ostracism was measured with the Ostracism Experience Scale (OES) that consists of 8 items (eg, in general, others leave me out of their group) measuring the frequency of ostracism experiences over the past 4 weeks on a 7-point Likert scale.⁵¹ The OES demonstrates good validity and reliability.

Social network and support were measured by the 6-item version of the Social Support Questionnaire (SSQ-6).⁵² Social network was measured by asking participants to list a maximum of 9 people whom they can rely on in relation to 6 different conditions (eg, being accepted, being supported, etc.). The score consisted of the number of people noted and thus ranges from 0 to 9. Social support was measured by asking participants’ satisfaction concerning the support they received on a 6-point Likert scale. The validity and reliability of the SSQ-6 are good.⁵²

Social undermining was measured with the 5-item Social Undermining Scale⁵³ that measures the frequency of negative interaction with a spouse or significant other over the past 4 weeks on a 5-point Likert scale and has good validity and reliability.⁵³

Socioeconomic status was measured with a multidimensional index⁵⁴ construed by summing the score of education, household income, and job position (total index score ranged 3–21). The answer choices for education and household income were created based on the census categories published by the statistical offices of Germany, Indonesia, and United States. The index measures participants’ current socioeconomic position relative to people from their country.

Social rank was measured with the Social Comparison Scale (SCS),²⁰ which consists of 11 bipolar items that ranged from 0 to 10 (eg, inferior-superior, left out-accepted) rated over the past 4 weeks. Higher scores indicate a more

positive view of the self in comparison with others. Good validity and reliability have been reported.²⁰

Negative schemas were measured with the negative-self and -others subscales from the Brief Core Schema Scales (BCSS).⁵⁵ Each of the scales contains 6 items (eg, negative-self schemas: I am unloved; negative-others schemas: Other people are hostile) rated on a 5-point Likert scale (1 = no, do not believe it to 5 = yes, believe it totally). Good validity and reliability of the scale have been reported.⁵⁵

Loneliness was measured with the UCLA Loneliness Scale, Version 3, which consists of 20 items (eg, I lacked companionship), rated on 4-point Likert scale (1 = never to 4 = often) over the past 4 weeks, and has shown good validity and reliability.⁵⁶

Analyses

The analyses were conducted with structural equation modeling (SEM) using the lavaan package version 0.5-18⁵⁷ in R version 3.2.2. A maximum likelihood estimation procedure with robust standard errors and Satorra-Bentler scaled statistic was used to correct for non-normal distribution. The Comparative Fit Index (CFI) > 0.95, root mean square error of approximation (RMSEA) < 0.06, and standardized root mean square residual (SRMR) < 0.08⁵⁸ along with the proposed cutoff criteria were used to assess the fit between the hypothesized models and the data. Chi-square was reported but not used as a goodness-of-fit criterion because it tends to reject models based on large sample sizes.⁵⁹ Moreover, we compared the relative goodness of fit of the different mediation models with the Akaike information criterion, where smaller values indicate a better fit.⁶⁰ We also reported the R^2 effect-size measure for each model as it has been shown to be a good measure for mediation analysis with a low bias for samples of $N \geq 100$.⁶¹

Latent Variable Specification. The SA latent variable was specified to be predicted by bullying at home, bullying at work, minority status, perceived discrimination, ostracism experience, social network, social support, social undermining, socioeconomic status, bullying at school, emotional child abuse, psychological child abuse, physical child abuse, and sexual child abuse. The positive and negative symptoms latent variables were specified according to the multidimensional factorial structure of the CAPE.⁴⁵ Depression, social rank, and negative schemas latent variables were specified according to their respective items. The Loneliness latent variable was specified according to the latent factorial structure of the scale.⁶²

Mediation Analysis. Following a recommended procedure,⁶³ we first tested for a direct relationship between the SA latent variable and the outcome latent variables, and then entered the postulated mediators to test for reduction in the estimates of the direct relationships. Furthermore, the bias-corrected bootstrap 95% confidence interval (CI) of the

indirect effect was used as another indicator of mediation as recommended.⁶⁴ A variable was considered a mediator if the CI of the indirect effect did not include 0. By including positive symptoms, negative symptoms, and depression as outcome variables simultaneously in one analysis, which is not possible in traditional regression analysis, it is possible to estimate the specific effect of the SA latent variable (independent variable, IV) and the mediators (M) on each single outcome while controlling for the effects of IV and M on the other outcomes. For example, if the mediation effect of negative schemas on psychotic symptoms is due to the covariance between psychotic symptoms and depression this would show as zero effect of the paths from SA to negative schemas on positive and negative symptoms, but a significant path to depression.

SEM also enables to directly estimate and account for measurement error terms, which makes the estimates more accurate than traditional regression approaches that are susceptible to overestimation or underestimation.⁶⁵ Reported path coefficients (γ and β) are completely standardized. Reported direct, indirect, and total effect coefficients are unstandardized. Additionally, the proportion of variance explained (R^2) by the model is reported as a measure of effect size that can be interpreted as small (.01), medium (.09), and large (.25) according to Cohen.⁶⁶

Results

Participant Characteristics

Detailed participant characteristics are reported in [table 1](#), and a table outlining the participants' characteristics per country is available in the supplementary section A. As

can be seen, the sample included a broad age range and—with very few exceptions—spanned the full range of possible answers concerning SA and the postulated mediators. Furthermore, 29% of the participants reported a lifetime mental diagnosis, and 3.5% a current diagnosis of a psychotic disorder.

Mediation Analyses

The tested models could be identified and fit indices were satisfactory meeting 2 out of 3 fit index criteria, except for the loneliness mediation model that only met one fit index (detailed fit indices are reported in [table 2](#)). The preconditions of mediation were fulfilled, which is indicated by significant bidirectional relationships between the SA latent variable, the mediator latent variables, and the outcome latent variables (see supplementary figure 1). Detailed path coefficients of the models are reported in [figure 1](#), and the indirect effect, total effect, and R^2 are reported in [table 3](#). In the direct effect model, the paths from SA to all outcomes were significant (positive symptoms, $\gamma = 0.45$, $P < .001$, $R^2 = .20$; negative symptoms, $\gamma = 0.61$, $P < .001$, $R^2 = .38$; depression, $\gamma = 0.67$, $P < .001$, $R^2 = .45$) with small to medium-sized effects.

As can be seen in [table 3](#), entering social rank as putative mediator increased the direct effect path from SA to positive symptoms while the indirect effect coefficient was negative indicating suppression (we conducted an additional exploratory analysis and found that taking SA out of the mediation model rendered the association between social rank and positive symptoms significant). However, social rank was a significant mediator for negative symptoms and

Table 1. Participant Characteristics

Characteristic	Mean	SD	Sample Range	Possible Range
Gender, female (%)	888 (37.8%)	—	—	—
Age	32.53	11.38	18–74	18–99
Socioeconomic status	10.06	3.85	3–21	3–21
Perceived discrimination	0.83	1.17	0–5	0–6
Minority status	0.87	0.89	0–5	0–5
Bullying victim experience at work	1.64	0.85	1–5	0–5
Bullying victim experience at home	1.72	0.89	1–5	0–5
Bullying victim experience at school	2.20	1.15	1–5	0–5
Social support	4.85	1.14	1–6	1–6
Social network	2.82	1.82	0–8	0–9
Ostracism experience	2.30	1.44	1–7	1–7
Social undermining	2.06	1.01	1–5	1–5
Emotional child abuse experience	1.51	1.96	0–5	0–5
Psychological child abuse experience	1.28	1.87	0–5	0–5
Physical child abuse experience	0.97	1.58	0–5	0–5
Sexual child abuse experience	0.54	1.24	0–5	0–5
Social rank	5.80	1.78	1–10	1–10
Negative schema	1.93	0.84	1–5	1–5
Loneliness	2.22	0.59	1–4	1–4
Positive psychotic symptoms	1.67	0.54	1–4	1–4
Negative psychotic symptoms	2.04	0.58	1–4	1–4
Depression	1.83	0.71	1–4	1–4

Table 2. Fit Indices of the Mediation Models

Model	Satorra-Bentler χ^2			RMSEA (90% CI)	SRMR	CFI	AIC ^a
	χ^{2a}	df	<i>P</i>				
Direct effect	8671	1522	<.01	0.045 (0.044, 0.046)	0.077	0.839	304 713
Mediation models							
Social rank	10 657	2172	<.01	0.041 (0.040, 0.041)	0.075	0.864	398 550
Negative schema	16 584	2256	<.01	0.052 (0.051, 0.053)	0.080	0.773	371 604
Loneliness	14 957	2825	<.01	0.043 (0.042, 0.043)	0.090	0.830	414 118

Note: AIC, Akaike information criterion; CFI, comparative fit index; CI, confidence interval; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual.

^aRounded to the next integer.

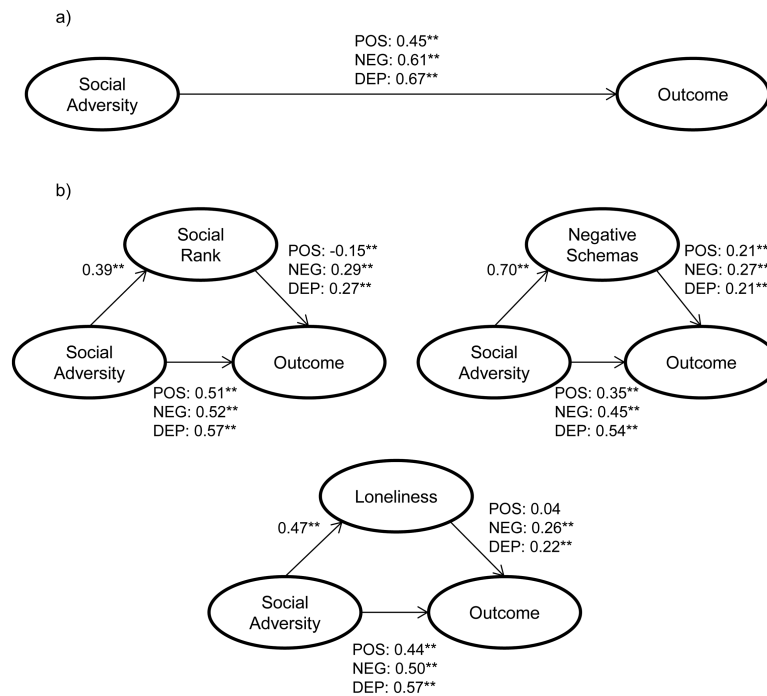


Fig. 1. Mediation analyses. The latent variable *Outcome* represents positive symptoms, negative symptoms, and depression. Each of the models was computed separately. (A) Direct effect model, (B) mediation models. Only latent variables are shown. Path coefficients are completely standardized estimates. ***P* < .01. DEP, depression; NEG, negative symptoms; POS, positive symptoms.

Table 3. Indirect Effect, Total Effect, and *R*² of the Mediation Models for Positive Symptoms, Negative Symptoms, and Depression

Model	Indirect Effect (95% CI)			Total Effect			<i>R</i> ²		
	POS	NEG	DEP	POS	NEG	DEP	POS	NEG	DEP
Direct effect				0.39	0.51	0.67	.20	.38	.45
Mediation model									
Social rank	-0.05 (-0.07, -0.03)	0.08 (0.06, 0.10)	0.10 (0.08, 0.13)	0.39	0.52	0.67	.22	.43	.52
Negative schemas	0.12 (0.08, 0.17)	0.16 (0.11, 0.20)	0.14 (0.10, 0.19)	0.43	0.53	0.69	.27	.44	.49
Loneliness	0.02 (-0.00, 0.04)	0.10 (0.08, 0.13)	0.11 (0.08, 0.13)	0.40	0.52	0.67	.21	.44	.50

Note: Unstandardized coefficient estimates are reported. CI, confidence interval; DEP, depression; NEG, negative symptoms; POS, positive symptoms.

depression, indicated by a reduction of the direct effect path coefficients from SA to negative symptoms and depression and by significant indirect effect coefficients (confidence

interval not including 0). The social rank mediation model explained a large proportion of variance of negative symptoms (*R*² = .43) and depression (*R*² = .52).

Negative schemas reduced the direct effect path coefficients of all outcomes and had significant indirect effects indicating mediation for positive symptoms, negative symptoms, and depression. Notably, the negative schemas mediation model explained a large proportion of variance of all outcomes (positive symptoms, $R^2 = .27$; negative symptoms, $R^2 = .44$; depression, $R^2 = .49$).

The path from loneliness to positive symptoms was not significant, and the indirect effect coefficient was insignificant, which indicated no mediation. The paths from loneliness to negative symptoms and depression were significant, and the indirect effect coefficients were significant, which indicated mediation. The loneliness mediation model explained a large proportion of variance of negative symptoms ($R^2 = .44$) and depression ($R^2 = .50$).

Analogous subgroup mediation analyses were conducted to investigate potential differences among countries, participants with and without a mental disorder, and those with a diagnosis from the schizophrenia spectrum. A similar pattern of results was found within each of these subgroups. Specifically, negative schemas were a significant mediator for the paths from SA to positive symptoms, negative symptoms, and depression. Social rank and loneliness were significant mediators for the paths from SA to negative symptoms and depression. For further details, please see section B in the supplementary text.

Discussion

This study set out to identify relevant mediators of the association between SA and positive and negative symptoms. As such, we investigated the putative translating role of cognitive vulnerability defined as perceived low social rank, negative schemas, and loneliness.

As expected, negative schemas were strongly linked to both SA and symptoms and turned out to be the most relevant mediators in regard to all symptomatic outcomes. Unspectacularly, this confirms cognitive conceptualizations of depression.⁶⁷ More interestingly, it also confirms cognitive models of psychosis, in which negative schemas and beliefs are postulated to play a central role in the development of both positive^{24,26,28,68} and negative⁶⁹ symptoms. The question of how negative schemas translate into psychotic symptoms, however, has been an ongoing subject of debate and speculation. One view is that delusions reduce feelings of inadequacy and the associated negative affect by attributing self-threatening events to others.^{24,70} For example, a patient who feels persecuted by the secret service at work could be preserving his or her self-esteem by holding the secret service responsible for own work-related failures. Other researchers²⁵ propose that persecutory delusions directly reflect impaired self-esteem and the associated emotions. According to this explanation, the delusion that the secret service is observing the patient reflects the patient's concern about his or her incompetence and the anxiety resulting from this view. Similarly,

the content of auditory hallucinations has been discussed as a direct reflection of negative views of self and others.^{71,72} Another potential mechanism with relevance to negative symptoms is that negative views of self and others will inhibit motivation in general and the natural drive to connect with others, and thus prevent experiences of self-efficacy and positive, corrective social experiences.⁷³

Social rank and loneliness, in contrast, only mediated the pathway from SA to negative symptoms and depression. The absence of a significant relationship between loneliness and positive symptoms is likely to be due to our stringent analysis controlling for depression and negative symptoms, which has not been done in previous studies (eg, ref.³⁴). Interpreted in this way, it confirms a previous study by our group (Jaya et al, unpublished data), in which we found that depression explains the relationship between loneliness and positive symptoms.

We found that taking social rank into account enhanced the strength of the relationship between SA and positive symptoms. Nevertheless, and in line with previous work (eg, ref.²³), we found a significant relationship between social rank and positive symptoms when computed in isolation. Thus, previous studies may have found a significant relationship between social rank and positive symptoms because they did not take SA into account. In regard to negative symptoms, however, social rank showed the postulated mediating effect. Thus, the idea that the appraisal of being socially inferior which is induced by SA fosters deficits in exploration and motivation which manifest in negative symptoms was supported. Moreover, our data show that this is not solely explained by depression.

Notably, we found that the mediation results were stable across countries and subgroups, indicating a global mechanism of cognitive vulnerability as a translator of the link between SA and psychosis and SA and depression. This is an important finding because to our knowledge the cognitive models of psychosis have not been investigated outside the European and North American context despite the fact that many psychological constructs are vulnerable to being affected by cultural idiosyncrasies.⁴¹

Strengths and Limitations

One limitation is that the cross-sectional design forced us to rely on assumptions in making inferences about the direction of the relationship of SA, mediators, and psychosis, which are based on previous experimental^{30,74} and longitudinal studies.⁷⁵ Longitudinal designs are required to further strengthen these assumptions, and our research group is currently pursuing this endeavor.

A strength of the study is that the participants covered the whole psychosis continuum as indicated by a relatively high prevalence of individuals with a diagnosis of mental disorder including psychotic disorder. Looking at associations across the continuum is advantageous when it comes to investigating putative causal factors because the findings

can be interpreted free of issues that often influence studies comparing clinical with nonclinical populations, such as selective small samples, treatment history, stigma, and medication. A limitation is that the recruiting method limited participants to those with access to the Internet. Similar to other studies that used crowdsourcing websites for recruitment (eg, ref.⁷⁶), participants in this study tended to be somewhat more educated in comparison with their national average and males were slightly overrepresented. The associations might have been even stronger in a sample with more representatives from low socioeconomic backgrounds. However, the sample spanned the full range on almost every variable assessed, and the sizes of the low-income groups were comparable in size with those provided in German and US census data so that we can exclude ground or ceiling effects on any of the variables. Although the sample was biased toward slightly younger participants, this cannot be considered as a fatal flaw when the aim of the study is to investigate pathways to psychosis, which are most relevant to people in their early 20s. Furthermore, although we oversampled participants with schizophrenia spectrum disorders to have sufficient variation in symptoms and increase statistical power for subgroup analyses, the rate of overall psychopathology in our sample was comparable with typical samples reported in epidemiological studies. For example, 29% of the participants in the study reported a lifetime mental disorder diagnosis, which is similar to the rates presented in representative population samples.⁷⁷

Conclusion

In sum, our expectation that cognitive vulnerability would explain a significant part of the psychological black box between SA and psychotic symptoms was confirmed. The strongest translating factor for all 3 types of symptomatic outcome seems to be dysfunctional schemas pertaining to the self and others. The mechanism may operate through a cascade of cognitive and behavioral mechanisms and their interactions, which need further elaboration. In contrast, perceiving oneself as being low in social rank and loneliness appear to be more relevant to negative symptoms and depression than to positive symptoms.

Overall, our results suggest that targeting cognitive vulnerability in people experiencing SA could have a protective effect in regard to psychotic symptoms. Reducing SA is likely to be challenging and costly and goes beyond the scope of the psychological and psychiatric profession. However, targeting cognitive vulnerability in people experiencing SA is well within the scope of the profession and could be a valid strategy for prevention of psychosis and other psychopathologies.

Supplementary Material

Supplementary material is available at <http://schizophreniabulletin.oxfordjournals.org>.

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