Title: Mentalizing impairment as a mediator between reported childhood abuse and outcome in nonaffective psychotic disorder.

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HIGHLIGHTS

- This study proposes mentalizing impairment as a pathogenic mechanism through which childhood abuse affects outcome in adult patients with non-affective psychotic disorder.

- Mentalizing impairment indeed is identified as a mediator, partially accounting for the effect of childhood abuse on negative symptom severity.

- No such mediation effect was found regarding positive symptom severity and social dysfunction.

ABSTRACT

Reported childhood abuse has been linked to the severity of clinical symptoms and social dysfunction in non-affective psychotic disorder. Impaired mentalizing ability may be one of the mechanisms accounting for this effect. This study examined whether impaired mentalizing mediates the effect of reported childhood abuse on positive symptoms, negative symptoms, and social dysfunction. Eighty-seven patients with non-affective psychotic disorder were examined. Reported childhood abuse was measured using the Childhood Experience of Care and Abuse interview. Additionally, the Social Functioning Scale and the Positive and Negative Syndrome Scale were used. The Hinting Task was used to measure mentalizing impairment. Reported childhood abuse was significantly related to the severity of positive and negative symptoms, not to social dysfunction. Reported childhood abuse was also related to mentalizing impairment. Mentalizing impairment was related to negative symptoms, but not to positive symptoms or social dysfunction. Mentalizing impairment accounted for 40% of the association between reported childhood abuse and negative symptoms, indicating partial mediation. A sensitivity analysis revealed that the mediating effect was only observed in those who reported fairly severe childhood abuse.

Keywords: Mentalization; psychosis; positive symptoms; negative symptoms; social functioning.

1. Introduction[1]

Patients with non-affective psychotic disorder are almost three times as likely as non-psychiatric controls to report a history of abuse in childhood (Varese et al., 2012). Moreover, reported childhood abuse is associated with the severity of positive and negative symptoms (Longden et al., 2015; Schenkel et al., 2005; Spauwen et al., 2006; Van Dam et al., 2015), and there is some evidence for an association with social dysfunction as well (Alameda et al., 2015; Stain et al., 2013). However, little is known about the underlying mechanisms. Recently, it has been proposed that one such mechanism is an impaired ability to mentalize (van Os et al., 2010). Mentalizing has been defined as the capacity to understand one's own and others' behaviour in terms of mental states, such as intentions, wishes, beliefs, and emotions (Bateman and Fonagy, 2012). Patients with non-affective psychotic disorder have been shown to perform poorly on different dimensions of mentalizing, such as 'theory of mind' (i.e. the ability to infer mental states from other's behavior; Sprong et al., 2007), identifying and describing their own emotional states (O'Driscoll, Laing and Mason, 2014) and recognizing others' emotional states (Trémeau, 2006).

No study to date has examined the possible mediating role of impaired mentalizing in the relation between reported childhood abuse and the outcome of non-affective psychotic disorder, even though it is a plausible underlying mechanism. Abuse in childhood has been related to impaired or delayed development of mentalizing (Cicchetti et al., 2003; Pears and

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[1] **Abbreviations**

CECA: Childhood Experience of Care and Abuse

HT: Hinting Task

SFS: Social Functioning Scale

PANSS: Positive and Negative Syndrome Scale

Fisher, 2005; Ensink et al., 2015) and poor understanding or discrimination of emotions (Rogosch, Cicchetti and Aber, 1995; Camras, Sachs-Alter, and Ribordy, 1996; Shipman and Zeman, 1999; Pollak et al., 2000; Edwards, Shipman and Brown, 2005).

Parental abuse is considered to be particularly detrimental to the development of mentalizing, because the groundwork of mentalizing is laid through day-to-day interactions with primary caregivers (Fonagy et al., 2004). By labelling the child's mental states, caregivers help the child understand his/her own mental states (Kim, 2015), which may be viewed as a prerequisite for the ability to infer the mental states of others (Brüne, 2005). In contrast, parental abuse can be viewed as reflecting an inability on the part of the caregiver to mentalize the inner experiences of the child, thereby depriving the child of a good role model for mentalizing (Kim, 2015). Additionally, parental abuse has been argued to impede mentalizing by inducing a lessened motivation to mentalize in the child, or even phobic avoidance of mentalizing, because reflecting on a caregiver's malevolent or uncaring mental states is overwhelmingly painful (Chiesa and Fonagy, 2014).

Another line of research suggests that an impaired ability to represent mental states may contribute to the severity of positive and negative symptoms in non-affective psychotic disorder (Frith, 2004). For instance, an inability to identify one's own intentions may contribute to the experience that one's actions are caused or influenced by an outside force (i.e., delusions of control). Moreover, verbal hallucinations and the experience of thought insertion could arguably be viewed as the incorrect representation of one's own thoughts. Delusions of persecution and reference, by definition, involve the misrepresentation of another person's intentions. Concerning negative symptoms, the inability to represent what others think, intend, or desire is likely to complicate social interactions, in turn increasing the tendency to withdraw from such situations. Similarly, the inability to use gestures, facial expressions, and tone of voice to express emotions – commonly referred to as 'flattened

affect' – may be exacerbated by an inability to understand the particular mental states conveyed by such communicational cues. Lastly, failing to identify one's own goals may contribute to avolition.

Partial support for this theory comes from a number of studies that have consistently associated impaired mentalizing ability with negative symptoms (Doody et al., 1998; Greig et al., 2004; Sergi et al., 2007) and social dysfunction (Couture et al., 2006; Fett et al., 2011). However, support for an association between impaired mentalizing ability and positive symptoms is weaker. Some studies have found such an association (Corcoran et al., 1995; Frith and Corcoran, 1996), but a majority of reviewed studies failed to do so (Garety and Freeman, 1999).

We do not presume that impaired mentalizing is the sole mechanism whereby childhood abuse can affect psychopathology of adult patients. A few mechanisms have already been suggested, including dopamine sensitization (Selten et al., 2013), insecure attachment (Read and Gumley, 2010), poorer emotional regulation (Lincoln, Marin, and Jaya, 2017), higher emotional reactivity to stress (Lardinois et al., 2011), and cognitive impairment (Grant and Beck, 2009). Such pathways interact with impaired mentalizing. For example, an insecure attachment style has been related to mentalizing impairment in a sample of patients with psychotic disorder (Macbeth et al., 2011). Attachment-related stress has also been implicated in poorer performance on mentalizing tasks (Nolte et al., 2013).

In the current study, we explored [1] whether reported childhood abuse is related to the severity of positive and negative symptoms and the level of social dysfunction; [2] whether reported childhood abuse is related to mentalizing impairment; [3] whether mentalizing impairment is related to the severity of positive symptoms, negative symptoms, and level of social dysfunction; and [4] whether impaired mentalizing explains at least part of the association between reported childhood abuse and these outcome variables.

2. Methods

2.1. Participants and procedure

Ninety outpatients with non-affective psychotic disorder were recruited from community treatment teams at regional mental health care institutes in the Netherlands (the Rivierduinen Institute for Mental Health Care located in Leiden, Voorhout, and Zoetermeer, and the Altrecht Institute for Mental Health Care in Zeist). The intervention teams were asked to refer any patients eligible for the study. Those referred to the study were contacted to assess their interest in participating and were screened regarding in- and exclusion criteria. Patients had to be at least 18 years old, have a non-affective psychotic disorder diagnosis from a psychiatrist, and be in treatment for a period between 6 months and 10 years to be eligible for inclusion. The diagnosis of non-affective psychotic disorder was also confirmed by researchers using the Comprehensive Assessment of History and Symptoms interview (Andreasen et al., 1992). Participants with intellectual disabilities, illiteracy, or lack of mastery of the Dutch language were excluded from participation. All participants provided written informed consent after the procedures had been fully explained and before testing. The tests were administered by trained researchers with at least a bachelor degree in (applied) psychology. The current study is part of a larger research project for which ethical approval was given by the Medical Research Ethics Committee of the University Hospital Maastricht and Maastricht University (13-3-066.5/ab).

2.2. Measures

The Childhood Experience of Care and Abuse (CECA; Bifulco et al., 1994), a semi-structured interview, was used to assess childhood abuse (at age 0–16 years). Childhood abuse comprised four types of maltreatment: psychological abuse, physical abuse, sexual abuse, and parental conflict. Based on theory, the link with impaired mentalizing is likely to be strongest

1   for parental abuse (Chiesa and Fonagy, 2014; Kim, 2015). Therefore, only abuse perpetrated

2   by caregivers was taken into account. Psychological abuse comprised extreme criticism,

3   rejection, humiliation, or terrorizing by a caregiver. Physical abuse was defined as bodily

4   harm inflicted by a caregiver that resulted in at least bruising. Sexual abuse was defined as the

5   participant's report of any unwanted sexual incident perpetrated by a caregiver. Parental

6   conflict was defined as the amount of fighting between the caregivers and/or with the child.

7   Each type of abuse was scored for both frequency and intensity. Intensity of abuse was rated

8   on a four-point Likert scale: 0 (none), 1 (some), 2 (moderate), 3 (marked), with the exception

9   of parental conflict, which was scored on a five-point scale that also included 4 (violence).

10   Frequency of abuse was rated on a five-point Likert-scale: 0 (never), 1 (rarely: once or twice),

11   2 (incidentally: more than two times, but not monthly), 3 (regularly: monthly or more often),

12   4 (often: weekly or more often). The severity score for each type of abuse was the product of

13   intensity and frequency. The total reported childhood abuse score, ranging from 0 to 52, was

14   the sum of the severity scores for each subtype of abuse.

15   The ability to mentalize was operationalized as the capacity to attribute intentions to

16   others. This was measured using the Hinting Task (HT; Corcoran et al., 1995), in which

17   participants read extracts that describe an interaction between two characters. In each case,

18   one of the characters says something with an implicit message. To infer the implicit message

19   from the literal one, an understanding of the character's beliefs or feelings is needed. If the

20   participant infers the message correctly, 2 points are scored. If a hint is needed in order to

21   infer the message correctly, a score of 1 is given. If the answer is incorrect or the participant

22   does not know, 0 points are scored. There are 10 passages, so participants can score up to 20

23   points. For ease of interpretation the HT was reverse coded, so that higher scores reflected

24   greater mentalizing impairment.

The Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987), an observer-rated instrument, was used to assess the severity of positive and negative symptoms during the 2 weeks preceding measurement. The positive syndrome scale comprises delusions, conceptual disorganization, hallucinations, excitement, grandiosity, suspiciousness, and hostility, rated on a seven-point Likert scale. The negative symptoms are represented by flattened affect, emotional withdrawal, poor rapport, passive social withdrawal, difficulty in abstract thinking, lack of spontaneity, and stereotyped thinking. Both scales have a range of 7 to 49. Interrater reliability was assessed by means of a videotaped interview, rated independently by all raters. Inter-rater reliability was high for the average of PANSS items (ICC = .91).

Social dysfunction was measured using the Social Functioning Scale (SFS), a self-report questionnaire (Birchwood et al., 1990). The SFS contains seven dimensions (social withdrawal, interpersonal communication, independence (competence), independence (performance), recreational activities, social activities, and employment) and has been found to be reliable, valid, sensitive, and responsive to change (Birchwood et al., 1990). The overall social functioning score is determined by averaging all subdomains, resulting in a potential range from 59.7 to 134.9. Again, for ease of interpretation the scale was reverse coded, so that higher a score on the SFS indicated greater dysfunction.

2.3. Statistical analyses

Three mediator models were tested, one for each outcome variable (positive symptoms, negative symptoms, and social dysfunction), with reported childhood abuse as the independent variable and mentalizing impairment as the mediator in each model. SPSS version 22 combined with Hayes's PROCESS macro (Hayes and Preacher, 2013) was used for the mediation analyses. The process macro uses non-parametric bootstrapping, which

1 involves random resampling of observations with replacement to obtain confidence intervals

2 for the indirect effect (and functions thereof). The bootstrap confidence intervals were based

3 on 10 000 resamples. Effects are considered significant if the confidence interval does not

4 contain 0. Mediation is present if the indirect effect (a and b) of the independent variable

5 (reported childhood abuse) through the mediator (mentalizing impairment) on the outcome

6 variables (positive symptoms, negative symptoms, and social dysfunction) is significant (i.e.,

7 the confidence interval does not contain 0) and the direct effect of the dependent variable on

8 the outcome variable while accounting for the mediator (c') is smaller than the total effect (c)

9 (figure 1).

10

11 [Figure 1 preferably here]

12

13 **3. Results**

14 *3.1 Sample characteristics*

15   Two participants dropped out of the study before completing all questionnaires, and

16 another participant refused to answer questions regarding childhood experiences. They were

17 excluded from analysis. The following results were obtained from analyses with the

18 remaining 87 patients. Of these participants, 36.8% ($n = 32$) reported no abuse, 63.2% ($n =$

19 55) reported at least mild forms of abuse in one or more categories, and 37.9 % ($n = 33$)

20 reported at least marked forms of abuse in one or more categories. Other descriptive statistics

21 are presented in Table 1.

22

23 [Table 1 preferably here]

3.2. Main effects

Reported childhood abuse was significantly related to the severity of positive symptoms ($b = 0.11$, 95% confidence interval [0.02, 0.20], $p = 0.014$) and negative symptoms ($b = 0.17$, 95% confidence interval [0.06, 0.28], $p = 0.004$), but not to social dysfunction ($b = 0.05$, 95% confidence interval [-0.10, 0.20], $p = 0.517$). Furthermore, reported childhood abuse was related to mentalizing impairment ($b = 0.06$, 95% confidence interval [0.01, 0.11], $p = 0.027$). Mentalizing impairment was not associated with the severity of positive symptoms ($b = 0.15$, 95% confidence interval [-0.20, 0.50], $p = 0.395$), but it was associated with severity of negative symptoms ($b = 1.20$, 95% confidence interval [0.82, 1.58], $p < 0.001$), and there was a positive, but not a significant association between mentalizing impairment and social dysfunction ($b = 0.55$, 95% confidence interval [-0.05, 1.14], $p = 0.073$). Interpretation of these results did not change when we added the other outcome variables as covariates to each separate analysis.

3.3 Mediation

In the case of negative symptoms only, the prerequisites of mediation – a significant association between independent variable, dependent variable, and mediator – were met. There was a significant indirect effect of reported childhood abuse on negative symptoms through mentalizing impairment, path a through b in figure 1 ($b = 0.07$, 95% confidence interval [0.002, 0.17], $p = 0.039$), indicative of a mediation effect. The total effect of childhood abuse on negative symptoms path c in figure 1 ($b = 0.17$, 95% confidence interval [0.06, 0.28], $p = 0.004$) was reduced by about 40% when mentalizing impairment was accounted for, path c' in figure 1 ($b = 0.10$, 95% confidence interval [0.003, 0.20], $p = 0.043$), indicating partial mediation.

The above analysis assumes that all variables are related in a linear fashion, however curve estimations revealed that a quadratic term may be a better fit for the relation between reported childhood abuse and negative symptom severity (R^2=0.180, $p < .001$), than a linear one (R^2=0.095, $p = .004$). A quadratic term also better fitted the relation between reported childhood abuse and impaired mentalizing (R^2=0.082, $p = 0.027$), instead of a linear one (R^2=0.056, $p = .027$). Both negative symptoms and mentalizing impairment increase exponentially as reported childhood abuse increases.

The use of a traditional mediation analysis in this case may be problematic, because it calculates the significance of one single indirect effect, assuming that the relationship between the independent variable, mediator and dependent variable is linear. However, in the current case the indirect effect is unlikely to be identical for each level of reported childhood abuse. We therefore also calculated the indirect effect using a mediation analysis that accounts for quadratic relationships, using the MEDCURVE macro (Hayes and Preacher, 2010). "Instantaneous indirect effects" were generated at different levels of reported childhood abuse (one standard deviation above and below the sample mean) as suggested by Hayes and Preacher (2010). Results showed, that only in the subgroup reporting relatively high childhood abuse (CECA ≥ 19), there was a significant indirect effect of childhood abuse ($\theta = 0.09$, 95% confidence interval [0.01, 0.22]). This model predicted about 40% (R^2=0.394, $p < .001$) of the variance in negative symptom severity.

4. Discussion

4.1 Discussion of the results

This study tested the hypothesis that mentalizing impairment constitutes a pathway through which parental abuse affects clinical and functional outcomes in non-affective psychotic

disorder. The majority of non-affective psychotic disorder patients in our sample reported experiencing parental abuse during their childhood. The severity of this abuse was associated with the levels of positive and negative symptoms and with mentalizing impairment, but not with social dysfunction. Mentalizing impairment, in turn, showed a significant relationship to the severity of negative symptoms, but no such relationship to positive symptoms or social dysfunction. Lastly, the relationship between reported childhood abuse and negative symptoms was partly mediated by mentalizing impairment, accounting for approximately 40% of the effect. A sensitivity analysis, which treated the relations between reported childhood abuse, negative symptoms and mentalizing impairment as quadratic, revealed that the mediating role of mentalizing impairment was only significant in the case of fairly severe abuse.

4.2 Comparison to previous findings

The current results replicate previous findings regarding the relationship of reported childhood abuse to clinical outcome (Schenkel et al., 2005; Spauwen et al., 2006; Longden et al., 2015; Van Dam et al., 2015) and support the theory that parental abuse is related to mentalizing impairment (Chiesa and Fonagy, 2014; Kim, 2015). While the findings do not support the idea that impaired mentalizing is related to positive symptoms, they do provide evidence of such a relationship to negative symptoms, in line with many previous studies (Garety and Freeman, 1999; Doody et al., 1998; Mitchley et al., 1998; Greig et al., 2004; Sergi et al., 2007). Positive symptoms may not reflect an overall impaired ability to represent mental states, but rather a tendency to excessively do so, or to 'hypermentalize' (Abu-Akel and Bailey, 2000; Clemmensen et al., 2016). Such a tendency has also been suggested to be state-like in nature, occurring only in specific circumstances (Walston et al., 2000; Charlton, 2003), which would explain the normal mentalizing performances of patients with

predominantly positive symptoms in most studies (Garety and Freeman, 1999). Interestingly, the current results also seem to echo recent observations that loneliness mediates the relation between social adversity and negative, but not positive symptoms (Jaya, Ascone, Lincoln, 2017). This may not come as a surprise as loneliness has been related to attachment-related stress (e.g. Wei et al., 2005), which in turn has been linked to impaired mentalizing (Nolte et al., 2013). Whatever the case may be, the current results support the notion that adversity may be related to negative and positive symptoms through different pathways, as Bentall and colleagues have recently suggested (2014). Unexpectedly, we did not replicate the previously established relationship between reported childhood abuse and social functioning (Lysaker et al., 2004; Stain et al., 2013; Alameda et al., 2015). A possible explanation for this discrepancy may be the amount of time since onset of psychosis. Previous studies observed such associations either before (Spauwen et al., 2006; Tikka et al., 2013), or shortly after (Stain et al., 2013; Alameda et al., 2015) onset of psychosis. The current sample consisted of patients who, on average, experienced their first psychotic episode more than 5 years ago. Social functioning deteriorates most in the first 5 years after onset of psychosis; the rate of this deterioration is influenced by factors such as drug abuse, lack of social support, and symptom distress (Birchwood et al., 1998). Possibly, social functioning is affected by a history of childhood abuse up to and around the onset of psychosis, but that other factors account for its decline afterwards. Alternatively, the effect of childhood abuse on social functioning may occur only in certain subgroups. For example, Boyette et al. (2014) found that the impact of reported childhood abuse on social dysfunction partly depends on the personality of the patient, whereas Lysaker et al. (2004) found that survivors of sexual abuse specifically showed poorer vocational outcome.

Furthermore, the positive relationship between mentalizing impairment and social dysfunction, although in the expected direction, was not significant. The relation between

mentalizing and functional outcome likely depends on the specific subdomains examined, as Couture, Penn and Roberts (2006) have suggested.

4.3 Clinical implications

This study provides initial support for the theory that impaired mentalizing ability is a potential pathway through which parental abuse affects the severity of negative symptoms in non-affective psychotic disorder. Although more research is needed to come to causal conclusions about the potentially pathogenic role of impaired mentalizing, it may be fruitful to examine the usefulness of targeting mentalizing ability as a treatment strategy for non-affective psychotic disorder. For example, mentalization based treatment (Brent et al., 2014; Weijers et al., 2016) and metacognitive therapy (van Donkersgoed et al., 2014) both target mentalizing by helping the patient to become aware and elaborate on their own affective states as well as those of others. Alternatively, mentalization based treatment could potentially be implemented as a preventive therapy focusing on those at risk for psychosis (Debbané et al., 2016). Furthermore, the results underscore the importance of taking into account the possibility of patients having experienced abuse in childhood and their level of mentalizing impairment, as these factors negatively contribute to outcome in different ways (Selten and Cantor-Graae, 2014).

4.4 Limitations and conclusions

Naturally, some limitations apply. First, childhood abuse scores were based on patient accounts. Some may argue this to be problematic since the validity of retrospective reports, especially by psychiatric patients has been questioned (Susser and Widom, 2013). However, reports of abuse by psychiatric patients, including those with psychosis, have generally been found to be reliable; (see Read et al., 2005 for an overview). Further, a prospective study of

young people very likely to have been exposed to sexual abuse clearly showed an increased

risk of schizophrenia (Cutajar et al., 2010).

Second, different forms of childhood abuse were pooled into a single severity score, because the relatively small sample size precluded sufficiently powered sub-group analyses. Future studies, involving larger sample sizes, should consider the effects of each subtype of abuse separately, as different types of abuse may contribute to different dimensions of symptomatology (Bentall et al., 2014).

Third, it is important to stress that evidence of mediation does not establish causality (Maxwell, Cole and Mitchell, 2011). A prospective study would therefore be preferable in order to make more robust claims concerning causality.

Fourth, only one type of mentalizing deficit was accounted for in this study. The ability to infer mental states of others, as measured by the hinting task, is a cognitive, other-oriented form of mentalizing and is only a partial indicator of the total construct of mentalizing. A number of dimensional axes have been proposed to underlie mentalizing, including cognitive–affective, implicit–explicit, and self–other oriented axes (Fonagy and Luyten, 2012). Specific mentalizing deficits may affect specific clinical symptoms differently, as has recently been argued (Debbané et al., 2016). Indeed, the severity of positive symptoms seems especially susceptible to deficits in self-oriented mentalizing (i.e. the ability to be aware of and identify self-generated mental events; e.g. Brunelin et al., 2007). Future studies should take different forms of mentalizing into account.

This study integrated two lines of research: one that highlights the role of impaired mentalizing regarding clinical and functional outcome in non-affective psychotic disorder (Frith, 2014) and another that underscores the developmental nature of mentalizing ability (Fonagy et al., 2004). Although recent research has increasingly focused on the role of mentalizing in non-affective psychotic disorder, so far it has largely ignored the

developmental origins of mentalizing ability. The current findings offer initial evidence that impaired mentalizing may constitute a pathway whereby childhood abuse affects adult negative symptoms, although such an effect is only likely to be observed when childhood abuse is fairly severe. Based on these findings, we believe that an understanding of the origins of impaired mentalizing may offer more insight into the pathogenesis of non-affective psychotic disorder.

9   **Contributors**

10 Author JW designed the study and wrote the first draft. PF edited the manuscript. All authors

11 reviewed, commented on and have approved the final manuscript.

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13 **Disclosure of interest**

14 The authors declare that they have no competing interest.

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1   APPENDIX

2

3   For potential meta-analytic purposes, the original (not the reverse coded) means, standard deviations

4   and correlations are presented in table 2.
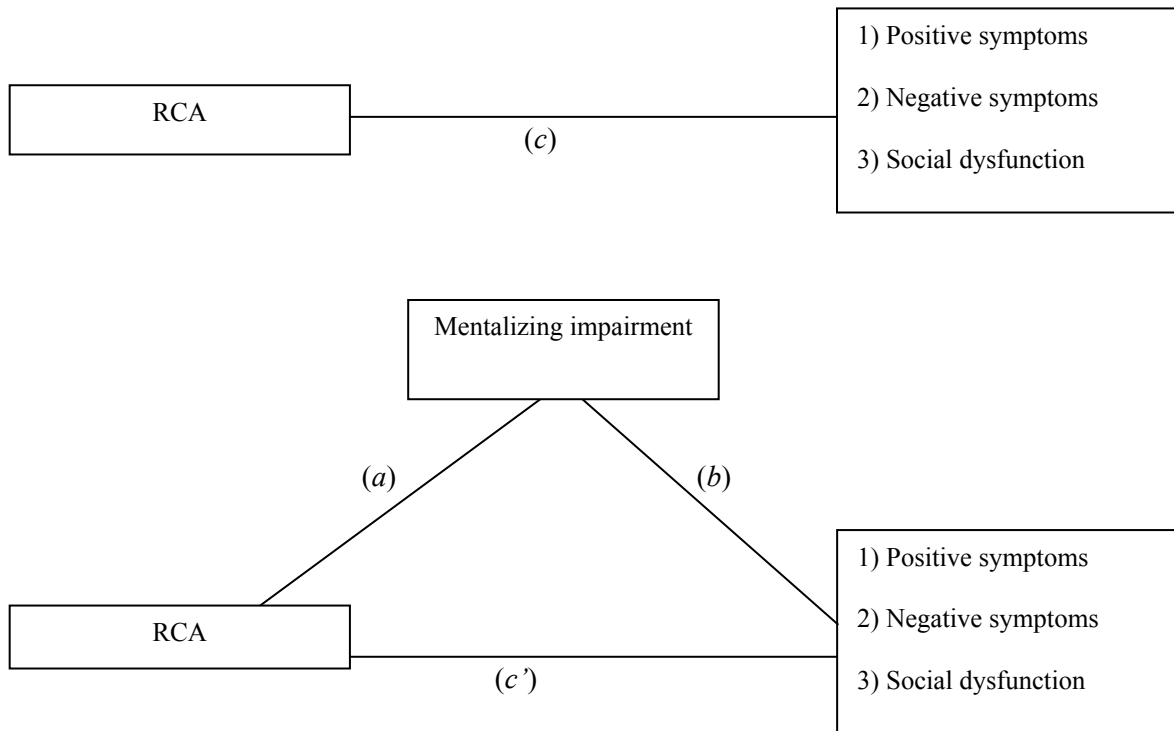
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6   [Table 2 preferably here]

7

Figure 1: Mediational model with reported childhood abuse (RCA) as independent variable, mentalizing impairment as mediator, and positive symptoms, negative symptoms, and social dysfunction as dependent variables.

Table 1. Sociodemographic characteristics of sample (N = 87).

Variable	*Mean ± SD*	Range
Age (y)	31.7 ± 8.2	19–57
Years since onset first psychosis	5.7 ± 4.0	1–22
Reported Childhood Abuse	8.7 ± 10.3	0–43
Household discord	5.5 ± 5.8	0–16
Physical abuse	1.2 ± 2.7	0–12
Emotional abuse	1.8 ± 3.9	0–12
Sexual abuse	0.1 ± 0.7	0–6

Variable	*n*	Percentage
Sex		
Male	56	64.4
DSM-IV diagnosis		
Schizophrenia	55	63.2
Psychotic disorder NOS	14	16.1
Schizoaffective disorder	12	13.8
Brief psychotic disorder	4	4.6
Delusional disorder	2	2.3

Table 2. Means, standard deviations, and correlations of the independent, dependent, and mediator variables (N=87)

		Pearson Correlation				
Variable	Mean ± SD (min–max)	CECA	PANSS (pos)	PANSS (neg)	SFS	HT
CECA	8.6 ± 10.3 (0–43)	1	.26*	.31**	-.09	-.24*
PANSS Positive	11.6 ± 4.4 (7–27)		1	.22*	-.09	-.10
PANSS Negative	12.0 ± 5.5 (7–31)			1	-.16	-.56**
SFS	109.1 ± 7.7 (87.1–129.1)				1	.20
HT	17.0 ± 2.6 (9–20)					1

*Correlation is Significant at the 0.05 level

**Correlation is significant at the 0.01 level

Note: The original means, standard deviations and correlations were included in the table, not the reverse-coded ones. CECA = Childhood Experience of Care and Abuse; PANSS = Positive and Negative Symptoms Scale; SFS = Social Functioning Scale; HT = Hinting Task.