



What if metacognition is not enough? Its association with delusion may be moderated by self-criticism

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Accepted: 28 October 2021

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Abstract

Metacognition among those reporting psychotic symptoms is associated with a distortion in the way they understand their own and others' mental states. Recent advances suggest that distortion in the form of self-criticism may activate a threat response and fuel symptom expression. At high level of self-criticism metacognition may reduce its protective role towards psychosis. Here, we explored whether the associations between impaired self-reflectivity and delusional ideation would decrease in the presence of self-criticism. A moderated regression model confirmed our hypothesis in a large sample of healthy young adults ($N = 2065$) even when controlled for sex, education, and family income. Our findings suggest how interventions aimed at reducing symptoms and promoting metacognition should always be interconnected with those targeting self-criticism.

Keywords Compassion · Delusional ideation · Metacognition · Psychosis · Self-criticism · Self-reflectivity

Introduction

Metacognition has been differently conceptualized, but often refers to the capacity to create a complex and nuanced understanding of our experience in the world in the context of severe mental health disorders (Lysaker et al., 2021). Metacognition has been suggested to involve several distinct functions: awareness of one's own (*self-reflectivity*) and other's (*awareness of others*) mental states, awareness that others may have viable alternative perspectives (*decentration*), and the use of metacognition at large to respond to psychosocial challenges (*mastery*) (Semerari et al., 2003).

Metacognition, and especially self-reflectivity, predicts the social functioning of those diagnosed with schizophrenia or other psychotic disorders (Lysaker et al., 2011). It is conceptualized as a dynamic architecture that, when impaired, may compromise how people with psychosis perceive themselves and their experience (Lysaker et al., 2021), leading to severe symptoms ranging from delusional ideation, to lack of meaning and even suicidality (Lysaker et al., 2019).

Recent studies have explored the protective role of self-compassion in persons diagnosed with schizophrenia and its association with metacognition (Bercovich et al., 2020; Hochheiser et al., 2020; MacBeth & Gumley, 2012). Psychotic symptoms are supposed to be related to both a reduced capacity to self-soothe and an increased proneness to experience threatening beliefs about self and others. This finally leads to an impairment in affect regulation and metacognitive functioning (Gumley & Liotti, 2018; Scheunemann et al., 2019).

These findings seem consistent with the hypothesis that the soothing system—a mammalian affect regulation system that is normally triggered by cues of social safety—is poorly accessible in those whose threat system is hyperactivated by self-criticism or other-criticism (Gilbert, 2020). The perception of either internal or external threat in the form of criticism may initiate a distress-response that impairs metacognition, affects regulation and sensory processing patterns, finally fueling symptom expression (Liotti

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& Gilbert, 2011; Petrocchi & Cheli, 2019; Serafini et al., 2016).

Although several studies have suggested the role of self-criticism in lessening meta-cognition and fueling psychotic-like symptoms, a more fine-grained analysis of the mechanisms involved is needed. Here, we hypothesize that self-criticism moderates the relationship between self-reflectivity and prodromal delusional symptoms.

Methods

Design and Sample

2065 young adults were recruited through online institutional platforms and social media. The study was approved by the institutional review board. All subjects were between 18 and 30 years old ($M=22.09$; $SD=3.33$) and could read and sign the informed consent form. Most of the sample was women (65.1%) and undergraduate students (72.4%) with a family income of 25,000 euros or less (63.1%).

Measures

Beck Cognitive Insight Scale (BCIS; Beck et al., 2004) self-reflectiveness scale is a 7-item measure of impaired self-reflectivity as a failure of person's capacity to monitor one's experience.

Forms of Self-criticizing/attacking and Self-reassuring Scale (FSCRS; Gilbert et al., 2004) self-hated scale is a 5-item measure of severe self-criticism reflecting hate or disgust for oneself.

Peter's Delusions Inventory (PDI; Peters et al., 2004) yes/no total score is a 21-item measure of prodromal delusional ideation in healthy samples.

Statistical Analysis

We used moderated regression to test the hypothesis that the association between impaired self-reflectivity and delusional ideation would depend on the level of self-criticism. All analyses were performed using SPSS 25 PROCESS macro (Hayes, 2018). There were no missing data. Subsidiary analyses are available in [Supplementary Materials](#).

Results

Delusional ideation correlates with impaired self-reflectivity ($r=.355$; $p<.001$) and self-criticism ($r=.367$; $p<.001$). As hypothesized, we observed a significant moderation effect (Table 1 and Fig. 1). The results indicated a weaker relationship between impaired self-reflectivity and delusional ideation for individuals with higher levels of self-criticism. Results persisted with sex, education, and family income controlled.

Discussion

Our main conclusion is that as self-criticism increases, impaired self-reflectivity become less strongly linked with delusional ideation. Although we used a non-clinical sample, these findings have several possible implications for understanding the experience of those reporting delusional ideation.

We hypothesize that higher levels of self-criticism either affect metacognitive functioning reducing its protective role against delusion (turn-off effect) or broadly initiate a threat response that is not specific for self-reflectivity and delusional ideation (potentiator effect). Both hypotheses are consistent with the existing literature about the role of self-criticism in reducing self-soothing and inhibiting metacognition

Table 1 Moderated Regression Model

Model Coefficients Summary	Beta	b	Standard Error	t	p
(Intercept)		2.195	0.388	5.655	.0000
Self-reflectivity	0.299	0.271	0.027	10.142	.0000
Self-criticism	0.44	0.309	0.06	5.155	.0000
Self-reflectivity x Self-criticism	-0.186	-0.007	0.004	-1.979	.0480
Conditional Effects	Self-criticism	Effect	Standard Error	t	p
	.1371	.2702	.0267	10.2373	.0000
	5.1191	.2342	.0192	12.2169	.0000
	10.1012	.1983	.0264	7.4996	.0000

Note: The moderated regression model was found significant ($R^2=.1946$; $F=9.8605$; $p=.0000$) as well as the test of interaction (R^2 change = .0015; $F=3.9153$; $p=.0480$). We report in Table 1 the Model Coefficients Summary and the Conditional Effects at levels of moderator: As self-criticism increases, the effect of the regression model decreases



Fig. 1 Association of Impaired Self-reflectivity and Delusional Ideation across Levels of Self-criticism. *Note.* Simple slopes are provided for levels of the moderator (self-criticism) 1 SD below the mean, at the mean, and 1 SD and 2 SD above the mean. We did not report values below 1 SD since the moderator values below 2 SD were not scored ($M = 5.11$; $SD = 4.98$; range between 0 to 20). At low levels of

self-criticism traits, there is a strong correlation between risk perception and vaccine hesitancy (left panel). At high levels of self-criticism traits, the association between risk perception and vaccine hesitancy is weaker (right panel). CI=confidence interval; PTCL=percentile. The figure was generated through interActive application (McCabe et al., 2018)

in those diagnosed with psychosis and not (Gilbert, 2020; Gilbert et al., 2004; Heriot-Maitland et al., 2019; Petrocchi & Cheli, 2019). Clinically speaking, we suggest that interventions aimed at reducing psychotic symptoms and promoting metacognition should always be interconnected with those aimed at reducing self-criticism and promoting self-soothing.

There were four main limitations in the study. First, our model shows a significant albeit small effect ($R^2 = .1946$). Although this value may reduce the power of our results (and their generalizability), we note that the conditional effects of our model were significant even when controlled for demographic variables. Moreover, a linear regression model of self-reflectivity as predicting delusional ideation showed a very small and much lower effect than the previous model ($R^2 = .126$).

Second, the cross-sectional nature of the design does not allow for tests of within-person hypotheses about how self-reflectivity, self-criticism, and delusional ideation interact over time. Third, this non-clinical sample does not allow us to generalize the results to those diagnosed with psychosis, but rather provides suggestions in this regard. Fourth, self-reported measures of metacognition may be affected by measurement bias: people with low metacognition may not be able to assess their self-reflectivity.

Conclusion

We found that self-criticism reduces the connection between impaired self-reflectivity and prodromal delusional ideation. Although the general effect was small, our results were significant and controlled for sex, education, and family income. The more self-critical people are, the less metacognition protects them from severe symptoms due to a broad threat response. Effective interventions should focus on the interaction between self-reflectivity and self-criticism rather than targeting just one (Bercovich et al., 2020; National Library of Medicine, NCT04764708).

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12144-021-02451-7>.

Data Availability The data that support the findings of this study are available from the corresponding author.

Declaration

Conflict of Interest Authors declare no conflict of interest.

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