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Letter to the Editor

Self-stigma related feelings of shame and facial fear recognition in individuals at clinical high risk for psychosis: A brief report

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Dear Editor,

1. Introduction

We examined the relationship between face emotion recognition (FER) and self-stigma related feelings of shame in respect to symptoms ("stigma shame") in young adults at clinical high risk (CHR) for psychosis. FER deficits and stigma are both characteristic of schizophrenia and exist prior to onset of index psychosis (Corcoran et al., 2015; Yang et al., 2015). Further, transition to psychosis in CHR individuals has been predicted by both FER deficits, particularly for "threat" emotions like fear (Corcoran et al., 2015), and by stigma stress, which occurs when appraisal of stigma as harmful exceeds appraisal of one's perceived resources to cope with this threat. (Rusch et al., 2015). Misperception of fear may be related to the experience of stigma, which relies on the perception of affective appraisal by others. To our knowledge, this is the first study of FER and stigma in a CHR cohort, albeit in a small sample. We study stigma shame related to symptoms, which can be considered a component of the "primary appraisal of stigma as harmful", which is the first component of the stress-coping model of stigma.

2. Experimental

The cohort was comprised of 28 CHR participants (18 males/10 females), ages 18–27 (mean(SD) = 22.2(3.0) years), ascertained using the Structured Interview for Psychosis-Risk Syndromes/Scale of Psychosis-Risk Symptoms (SIPS/SOPS) (Miller et al., 1999). FER was assessed using the Penn Emotion Recognition Task (ER-40) (Gur et al., 2002). Self-stigma related feelings of shame (herein referred to as "stigma shame") were assessed using the index of 'negative emotions related to symptoms' scale from Yang's CHR stigma measure, which includes shame, embarrassment, and/or feeling different from others on the basis of symptoms and experiences that led them to come to a CHR clinic (Yang et al., 2015).

Spearman correlations were done to investigate the relationship between stigma shame and fear emotion processing, with regression analyses done to determine any confounding by clinical or demographic features.

3. Results

We found that fear accuracy was negatively correlated with stigma shame ($r = -0.41$; $p = .029$). Further, stratifying the cohort using a median split, the "low shame" subgroup showed better fear accuracy than the "high shame" group (mean (SD): 7.5 (0.7) vs. 6.7 (0.9); $t_{1,26} = -2.6$, $p = .01$) (Fig. 1a). The association of fear accuracy and stigma shame survived adjustment for prodromal symptom severity and could not be accounted for by age or sex. Of note, the association of FER accuracy and stigma shame was specific to fear, as no significant associations were found with stigma shame for happy, angry, sad, or neutral faces (all p's > 0.05). Associations of fear processing deficits with stigma shame extended beyond accurate identification of fear, as there was also a significant association between misattribution of fear to non-fearful faces and stigma shame ($r = 0.37$, $p = .05$) (Fig. 1b), which also was unrelated to symptoms, age or sex.

4. Discussion

Overall, we showed that among CHR individuals, greater stigma shame was associated with worse accuracy in identification of fear in faces, and greater misattribution of fear to non-fearful face emotion stimuli. Of course, in this cross-sectional study, causal direction can only be inferred. It may be that FER deficits lead to stigma, as psychosis spectrum youth show a lag in development of face emotion recognition as early as eight years old, using neurocognitive growth charting (Gur et al., 2014). It is plausible that such early FER deficits, especially in respect to threat and fear, could lead to misattribution of others' emotions and intentions, and subsequent suspiciousness, stigma stress and stigma shame.

However, there is also a body of literature that shows that anxiety (trait and induced state) can modify FER, including both impairment in FER accuracy and increase in misattribution, specifically of fear (Attwood et al., 2017). We have previously shown that shame related to symptoms, using this same scale, is associated with depression in CHR patients, assessed using the Beck Inventory (Yang et al., 2015). Therefore, it is plausible that the depression common to the psychosis risk syndrome, and the related shame associated with symptoms, can also lead to impairment in FER.

It may also be that the association of fear processing deficits and stigma in CHR individuals is iterative and bidirectional in causation, which can be tested in longitudinal studies. The neural mechanisms underlying their association likely entail changes in amygdala function and activation. CHR youth show increased amygdala activity in response to

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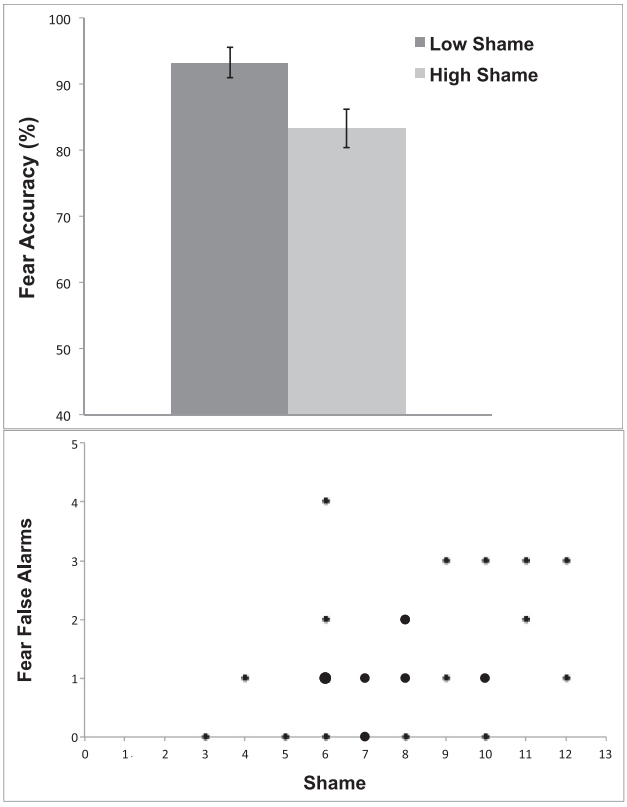

Fig. 1. a. Fear accuracy and stigma shame in CHR individuals. b. Fear misperception and stigma shame in CHR individuals. Note: Larger dots represent more than one participant.

threatening facial expressions (Wolf et al., 2015), and amygdala functioning has been associated in schizophrenia with both FER deficits, especially fear (Taylor et al., 2012), and stigma (Raij et al., 2014). Longitudinal studies therefore might include both resting and task-related neuroimaging paradigms for FER and stigma in CHR.

As FER deficits and stigma are interrelated, and both are associated with psychosis risk and functional impairment, trials of interventions are warranted. In schizophrenia, FER deficits have been variably improved in schizophrenia with oxytocin administration (Averbeck et al., 2012), and interventions targeting social cognition (Grant et al., 2017), while anti-stigma interventions related to psychosis have proved promising (Yang et al., 2015). It would be useful to implement these trials in CHR cohorts, and to determine if treatments targeting FER deficits also reduce stigma shame, and if efforts to reduce stigma might also improve FER, especially fear processing; these interventions hold promise for preventive intervention and improvement of concurrent functional impairments.

Conflict of interest

No authors have any conflict of interest.

Contributors

Cheryl Corcoran and Lawrence Yang designed the study and wrote the protocol. Francesca Crump and Jenny Shencollected the data and ensured its integrity. Emmett Larsen, Shaynna Herrera, and Cheryl Corcoran managed the literature search, and were assisted in statistical analyses and preparations of figures by Zarina Bilgrami, Cansu Sarac and Riaz Shaik. Emmett Larsen and Shaynna Herrera wrote the initial iterations of the manuscript, with editing and input by Cheryl Corcoran. All authors have contributed to and have approved the final manuscript.

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