



## Original article

# Negative social comparisons and psychosis proneness in a healthy adolescent population

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## ABSTRACT

There is growing evidence of an association between negative social comparisons (NSC) and both psychosis, and psychosis proneness. The majority of the work thus far, however, has focused largely on one type of NSC, namely, social rank. Whilst social rank is clearly an important factor, an individual's perception of belonging is likely also of importance; particularly, when considering individuals from collectivistic cultures such as China, where greater emphasis is placed on fitting into the group. There is also limited research investigating what factors may contribute towards the relationship between NSC and psychosis proneness, and to what extent this relationship may be due to common familial factors. To address these issues, we examined whether (1) Social rank and perceived belonging predict negative, positive and depressive psychotic experiences in a Chinese, adolescent, twin and sibling population, (2) coping styles moderate the impact of these relationships and (3), there is a familial association between NSC and psychosis proneness. Both social rank and perceived belonging were found to predict the negative and depressive dimensions of psychosis. These relationships were moderated by problem-focused coping styles. Interestingly, the association between perception of belonging, and negative psychotic experiences was familial—and stronger in Monozygotic twins—indicating perhaps shared aetiology due to common genes. Our findings highlight NSC as potential vulnerability markers for negative and depressive psychotic experiences, and suggest potentially different aetiological pathways amongst different NSC and different psychotic experiences. On a clinical level, our findings emphasize the need to consider coping styles when treating at-risk individuals.

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## 1. Introduction

Several influential theories of mental disorder, and in particular psychosis, have highlighted the potentially important role of negative social comparisons (NSC). Gilbert and Allan [1], for example, suggested that individuals who perceive themselves as more subordinate or lower ranking compared to others are at greater risk of developing mental disorder. Similarly, in their introduction to the *Social Defeat Hypothesis*, Selten et al. propose perceptions of holding “a subordinate position” or “outsider status” to be significant risk factors for the development of psychosis [2]. More recently, in relation to psychosis, researchers

have proposed a paranoia hierarchy in which social evaluative concerns, or feelings of inadequacy compared to others, form the basis of the paranoia experience [3,4].

There is now growing evidence to support these proposals implicating NSC in the development of psychosis. Negative social comparative beliefs, for example, have been found to be associated with hallucinations, such as patients' perceptions of the power of their voices [5–7]. Social rank (one form of NSC) has also been reported to predict paranoia in the general population [8] and play a key role in the transition from subclinical to clinical levels of paranoia [3,4]. Most recently, NSC have been shown to predict positive and negative psychotic experiences, and play a mediatory role between social adversity and negative psychotic experiences [9]. Using advanced modelling techniques and longitudinal approaches, several studies have also examined the directionality of these effects, and found NSC to exist before the emergence of these subclinical psychotic

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experiences [e.g. 10]. This suggests that NSC may represent a potential vulnerability marker for the development of psychosis.

Although these studies provide important preliminary evidence into the association between NSC and psychosis, the majority have tended to either use only the social “rank” scale (e.g. 4) or a total score comprised of the two subscales (social rank and belonging). Whilst social rank, or an individual’s beliefs regarding their social standing or position in comparison to others [11], is clearly an important factor, an individual’s perceptions of belonging or fitting into “the group” – another form of NSC – seems equally important to consider. This may be particularly significant when considering individuals from collectivistic cultures, such as China, who are thought to have more interdependent self-construals and thus place greater emphasis on the group and interpersonal relations [12], and consequently may be more impacted by lower perceptions of belonging. Based on these predictions, we sought to investigate how different types of NSC beliefs (rank and belonging) relate to the different dimensions of psychosis proneness (positive, negative, depressive) within a Chinese population.

In addition to further clarifying the link between NSC and psychosis proneness, it is important to determine what factors may act as moderators of this relationship, as these may represent important targets for intervention. This is particularly important given the findings of a recent study, which suggested that NSC beliefs alone may not be sufficient to induce paranoia. In an interesting study, Ascone et al. [13] induced feelings of lower rank in participants through the use of an experimental task, which mimicked social network interactions, and found social rank to affect sadness, but not paranoia. Furthermore, a significant moderation effect of fear of rejection between the experimental conditions (i.e. pre- and post-experimental manipulation of social rank) was found. These findings highlight the importance of considering which factors may exacerbate or buffer the impact of NSC on the development of psychosis.

One factor that may play a moderating role is the way in which an individual copes, or deals, with their NSC beliefs. Coping style seems to play a crucial role in the development and maintenance of psychotic symptoms in psychosis prone and at-risk individuals [14–18], and hence it is important to identify their precise role in the relationship between NSC and psychotic experiences. However, to our knowledge, no study to date has specifically examined the role of coping strategies in this relationship.

Coping styles are commonly classified into emotion-focused and problem-focused strategies [19]. Emotion-focused strategies aim at soothing the negative associated emotions and moving away from the problem (e.g. thinking reassuring thoughts). Problem-focused strategies aim instead at actively trying to solve the problem at hand and focus on the source of the problem (e.g. engaging in social activities to cope with feelings of isolation or seeking social support to feel included) [20,21]. Problem-focused strategies have been found to be associated with better mental health outcomes for adolescents [20] and more effective dealing with daily stressors [22]. Yet, individuals with early psychosis generally report more emotion-focused coping strategies [22]. We therefore sought to examine the role of coping styles in the relationship between NSC and psychosis proneness. Understanding whether different coping styles may exacerbate or buffer the harmful effects of NSC on psychosis proneness, will allow for more effective and targeted interventions.

Finally, when examining vulnerability markers for psychosis it is also important to consider possible familial influences. Specifically, whether familial (genetic and shared environmental) or non-shared environmental factors may explain this relationship, thereby opening up new avenues for translational research. Whilst little is known about the extent to which genetic and shared

environmental influences (i.e. factors shared within families) may contribute to negative social comparisons, research suggests a high percentage of variance in self-esteem—a closely related concept—to be explained by such factors [23]. Furthermore, there is some evidence that other factors, which may be linked with negative social comparisons, such as stress reactivity, may congregate with psychosis proneness [24]. That is, stress reactivity and psychosis proneness seem to be explainable by common genetic influences. It therefore seems possible that negative social comparisons and psychosis proneness may also share common etiological influences including shared environmental (and potentially genetic) factors. We therefore also examined the extent to which the relationship between social comparisons and psychosis proneness is influenced by familial and non-familial factors. If familial, this could indicate that the two share, to some extent, their genetic or shared environmental aetiological factors.

Aims of the study:

- to determine how different types of social comparative beliefs (i.e. rank and belonging) are associated with the three dimensions of psychosis proneness (i.e. positive, negative and depressive) in a Chinese population;
- to examine whether coping styles moderate the impact of NSC on psychosis proneness;
- to explore whether there is a familial association between NSC and psychosis proneness.

We hypothesized that NSC will predict all three forms of psychotic experiences (negative, positive and affective). We further hypothesized that problem-focused coping styles (e.g. seeking social support) will buffer the harmful effect of NSC on psychosis proneness, and that emotion-focused strategies (e.g. thinking reassuring thoughts) will exacerbate this relationship. Finally, we hypothesized that NSC (both belonging and rank) will share familial aetiology with all three forms of psychotic experiences.

## 2. Material and methods

### 2.1. Procedure

Ethical approval was obtained from the Human Research Ethics Committee of the University of Hong Kong. Participants signed written consent before beginning the protocol, and in the case of minors, a legal guardian also provided written consent.

### 2.2. Participants

The sample included healthy, Chinese adolescents from the general population. Participants were recruited from Hong Kong, Beijing, Guangzhou, Nanjing and Qingdao. Participants from Beijing were recruited through the Chinese National twin register. Participants from Hong Kong, and all other locations in Mainland China were recruited through secondary schools and universities. Schools and universities from many regions of Hong Kong and Mainland China were included to ensure a sample truly representative of Chinese adolescents. Only non-clinical (i.e. those with no history of mental disorder or current mental disorder) participants were included. Only individuals of Chinese ethnicity who were native Chinese speakers were included.

The initial sample consisted of 201 individuals including 76 twin pairs and 49 siblings. Thirteen individuals were removed from the sample due to missing data, thus resulting in a final sample of 188 participants including 44 siblings, 70 twin pairs (MZ = 37, DZ = 25, Unknown = 8), 3 twins without their co-twins

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