



Brief report

Anticipatory and consummatory components of the experience of pleasure in schizophrenia: Cross-cultural validation and extension

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ARTICLE INFO

Article history:

Received 9 November 2008

Received in revised form 16 January 2009

Accepted 22 January 2009

Keywords:

Anhedonia

Schizophrenia

Chinese

ABSTRACT

This study examined anticipatory and consummatory pleasure in schizophrenia patients with and without negative symptoms. Negative symptom patients experienced less anticipatory pleasure than non-negative symptom patients; only one facet of consummatory pleasure was unaffected in negative schizophrenia. Greater pleasure deficits were correlated with more severe positive and negative symptoms.

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1. Introduction

Anhedonia, or diminished experience of pleasure, is one of the prominent negative symptoms of schizophrenia (Bleuler, 1950; Kraepelin, 1971). However, the nature of this emotional disturbance is not well understood. Findings from self-report scales and interview-based ratings suggest that patients with schizophrenia experience low levels of positive emotion and high levels of negative emotion (Berenbaum and Fjuita, 1994), and high levels of anhedonia and negative emotion (Earnest and Kring, 1997) compared with people without schizophrenia. Findings from emotion-induction procedures suggest that patients with schizophrenia do not demonstrate impairments in their reported experience to emotional stimuli as compared with healthy controls (Kring et al., 1993; Kring and Neale, 1996; Kring and Moran, 2008). A meta-analysis found that people with schizophrenia did not report hedonic impairments in response to laboratory stimuli, but they did report higher levels of negative emotion in response to positive and neutral stimuli compared with people without schizophrenia (Cohen and Minor, *in press*). Taken together,

these findings suggest that patients with schizophrenia are not anhedonic in their “in the moment” experience of pleasure.

The discrepant findings may be due to the different assessment approaches (Horan et al., 2006) and the definition of anhedonia (Loas et al., 1999). Findings from both animal studies and affective neuroscience suggest that hedonic capacity is not a monolithic phenomenon but can be parsed into distinct subcomponents including consummatory (or liking) and anticipatory pleasure (or wanting) (Berridge and Robinson, 1998, 2003; Berridge and Kringelbach, 2008; Klein, 1987). Consummatory pleasure is more closely linked to satiation, or a resolution of desire, an “in the moment” experience of pleasure, whereas anticipatory or appetitive pleasure is more closely linked to motivation, goal-directed behavior and the experience of “wanting” (Klein, 1987).

Gard et al. (2006) developed a self-report measure, the Temporal Experience of Pleasure Scale (TEPS), to measure these two components of hedonic capacity in people with and without schizophrenia. This scale successfully discriminates patients with schizophrenia from healthy controls in terms of anticipatory pleasure deficits but not consummatory pleasure (Gard et al., 2007; Loas et al., *in press*). Chan et al. (*submitted for publication*) demonstrated that a Chinese version of the TEPS captures four factors in addition to the two factors suggested by Gard et al. (2006), namely a consummatory contextual factor, a consummatory abstract factor, an anticipatory contextual

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factor, and an anticipatory abstract factor, among 2275 healthy students. The contextual factors tap into touchable and concrete scenarios, such as, “I enjoy taking a deep breath of fresh air when I walk outside”, whereas the abstract factors tap into aesthetic and less concrete scenarios, such as, “Looking forward to a pleasurable experience is in itself pleasurable”.

These findings suggest that there may be cross-cultural variations in consummatory and anticipatory pleasure. Tsai (2007) found that Westerners value high arousal positive states, such as “enthusiastic” and “excited,” whereas East Asians value low arousal positive states, such as “calm” and “peaceful”; moreover, Chinese people reported lower frequency and intensity of both positive and negative emotions than other people (Eid and Diener, 2001). The current study was designed to further examine the clinical utility of the TEPS in a group of schizophrenia patients in China.

2. Methods

2.1. Participants

Fifty-five patients with schizophrenia who fulfilled DSM-IV (American Psychiatric Association, 1994) criteria were recruited from Beijing Anding Hospital and Shantou Mental Health Center. The severity of clinical symptoms was measured with the Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987) administered by a well-trained psychiatrist. All patients were being treated with antipsychotic medications (see Table 1). The present study was approved by the collaborating institutions; written informed consent was obtained before the study began.

2.2. Measure

The Temporal Experience of Pleasure Scale (TEPS) (Gard et al., 2006, Chinese version, Chan et al., submitted for publication) was used to measure experiences of pleasure. The Chinese version has four factors: abstract anticipatory, contextual anticipatory, abstract consummatory and contextual consummatory. We also combined abstract anticipatory and contextual factors for the anticipatory and consummatory subscales of Gard et al. (2006).

2.3. Data analysis

In order to compare the experience of pleasure between patients with and without negative symptoms, we divided the patients into two groups: the negative symptom group had a score of 4 (medium severity) or more on any of the three symptoms in the PANSS relating to emotion (blunted affect, emotional withdrawal, passive/apathetic social withdrawal); the non-negative symptom group had a score of less than 4 on these three items. TEPS scores between the two groups were compared using one-way analysis of variance (ANOVA). Correlational analyses between TEPS scores and clinical symptoms (i.e., PANSS scores) were conducted.

3. Results

3.1. Demographic and clinical variables of participants

Both age and education were non-significantly different between groups. Negative and non-negative symptom patients did not differ

Table 1
Summary of the demographic and clinical information for the patients with and without negative symptoms.

	Non-negative (N=34)		Negative (N=21)		F	P
	Mean	S.D.	Mean	S.D.		
Gender	21:13		18:3		3.61	0.057
Age (years)	31.59	10.41	31.24	11.62	0.01	0.908
Education (years)	11.62	3.54	11.48	2.84	0.02	0.878
Duration of illness (years)	7.27	7.11	7.25	7.67	0.00	0.994
Medication (chlorpromazine equivalence, mg/day)	312.68	168.37	369.10	257.91	0.97	0.330
Medication type						
Typical:Atypical:Mixed	10:23:1		2:16:3		4.78	0.091
PANSS						
Positive symptoms	14.18	5.47	13.48	6.15	0.19	0.662
Negative symptoms	11.79	3.70	21.10	3.91	78.59	0.000
General psychopathology	26.47	4.47	29.43	6.38	4.08	0.048
Total score	53.59	10.87	64.76	14.24	10.79	0.002

For gender proportion and medication type, chi-squared test was used. In medication type, mixed indicates that both atypical and typical medications were used.

Table 2
Comparison of TEPS factor score and total score.

	Non-negative (N=34)		Negative (N=21)		F	P
	Mean	S.D.	Mean	S.D.		
Contextual anticipatory	16.44	4.70	13.86	3.98	4.39	0.041*
Abstract anticipatory	17.82	4.00	15.52	4.70	3.75	0.058**
Contextual consummatory	15.35	3.89	12.90	4.33	4.71	0.034*
Abstract consummatory	25.18	6.24	23.86	5.51	0.63	0.430
Anticipatory	34.26	7.67	29.38	6.88	5.68	0.021*
Consummatory	40.53	9.31	36.76	9.06	2.17	0.147
TEPS total score	74.79	15.94	66.14	13.55	4.27	0.044**

* Indicates $p < 0.05$.

** Indicates $p < 0.01$.

significantly in positive symptoms. Table 1 presents the demographic information for the patients with and without negative symptoms.

3.2. Comparison of TEPS

On the basis of the original TEPS subscales (Gard et al., 2006), the negative symptom patients reported less anticipatory pleasure than non-negative symptom patients [$F(1,53) = 5.68, P = 0.021$], but did not differ in reported consummatory pleasure.

However, non-negative symptom patients reported experiencing significantly more pleasure than negative symptom patients in the following domains: contextual anticipatory [$F(1,53) = 4.39, P = 0.04$]; contextual consummatory [$F(1,53) = 4.71, P = 0.034$]. Non-negative symptom patients tended to report experiencing more abstract anticipatory pleasure than negative symptom patients [$F(1,53) = 3.75, P = 0.058$]. No significant differences were found in abstract consummatory pleasure (see Table 2). There were no gender differences in scores on the TEPS sub-scales (F ranged from 0.118 to 2.097, P ranged from 0.153 to 0.732).

3.3. Correlation between TEPS and clinical symptoms

We performed correlational analyses between PANSS scores and TEPS scores in all patients (the general pattern of correlations was similar for patients with and without negative symptoms). PANSS positive and negative symptoms were negatively correlated with TEPS scores (see Table 3). Thus, diminished consummatory and anticipatory pleasure among schizophrenia patients was associated with higher symptom levels.

With respect to specific emotion symptoms, anticipatory pleasure was negatively correlated with social withdrawal ($r = -0.46, P < 0.001$); tended to be negatively correlated with experience and emotional withdrawal ($r = -0.24, P = 0.078$), but was not related to blunted affect ($r = -0.15, P = 0.268$). Similarly, consummatory pleasure was negatively related to social withdrawal and emotional withdrawal, but not blunted affect.

Table 3
Correlation between TEPS and clinical symptoms (N=55).

	PANSS_P	PANSS_N	PANSS_T
Contextual anticipatory	-0.27*	-0.34*	-0.39**
Abstract anticipatory	-0.34*	-0.25	-0.34*
Contextual consummatory	-0.19	-0.32*	-0.33*
Abstract consummatory	-0.41**	-0.29*	-0.46**
Anticipatory	-0.35**	-0.34*	-0.43**
Consummatory	-0.35**	-0.33*	-0.44**

* Indicates $p < 0.05$.

** Indicates $p < 0.01$.

4. Discussion

The current study showed that schizophrenia patients without negative symptoms report experiencing more anticipatory pleasure than those with negative symptoms. Moreover, the reported experience of pleasure was inversely correlated with clinical symptoms, indicating that greater pleasure deficits were linked with more severe symptoms.

These findings are broadly consistent with the findings of Gard et al. (2007), who found that clinician-rated anhedonia was correlated with anticipatory but not consummatory pleasure. In the present study, the negative symptom patients and non-negative symptom patients differed in anticipatory pleasure but not in consummatory pleasure. Juckel et al. (2006a,b) found that unmedicated schizophrenia patients and patients treated with typical neuroleptics showed reduced ventral striatal activation during the presentation of reward-indicating cues, compared with controls, and reduced activation in the ventral striatum during exposure to reward-indicating versus neutral visual cues was inversely correlated with severity of negative symptoms. Our findings also support the view that the TEPS captures the experience of emotion as revealed by the results that “experiential” negative symptoms were more highly related to anticipatory anhedonia than the “expressive” negative symptoms.

It is noteworthy that the Chinese patients with negative symptoms reported experiencing less contextual pleasure, in both anticipatory and consummatory domains, than those without negative symptoms. Indeed, only one facet of consummatory pleasure is unaffected in these negative schizophrenia patients in China. The contextual factor comprises items capturing specific and concrete items such as food. These items are much valued and emphasized by the Chinese people. The deficits observed in the anticipatory and consummatory pleasure contextual experiences among the current Chinese patients with negative symptoms suggest that the contextual factor is sensitive in discriminating patients with versus without negative symptoms. Given the fairly small sample size, it will be important to replicate these findings in a larger sample using a more specific rating scale to assess negative symptoms, such as the Scale for the Assessment of Negative Symptoms (Andreasen, 1983).

Contributors

Raymond Chan designed the study, analyzed the data, and wrote up the first draft of the paper; Ya Wang, Jia Huang, Yanfang Shi, and Yuna Wang administered the tests and questionnaires to the participants; Zheng Ma performed clinical interviews and ratings; Ya Wang and Simon Lai analyzed the data; Ann Kring contributed to the design of the research and was involved in improving the draft of the paper; Xiao-hong Hong, and Zhanjiang Li were the last two authors to read through the paper. All authors contributed to and approved the final text.

Role of funding source

This study was supported partially by the Research Initiation Fund (07CX031003) and the Research Fund (KSCX2-YW-R-131) from the Institute of Psychology, Chinese Academy of Sciences, and the National Basic Research Programme (973 Programme No. 2007CB512302) to Raymond Chan. These funding agents had no further role in the study design; in the collection, analysis and interpretation of the data; in the writing of the manuscript; and in the decision to submit the paper for publication.

Conflicts of interest

The authors have no conflicts of interest for this study.

Acknowledgements

The authors would like to acknowledge the funding sources of the Institute of Psychology, Chinese Academy of Sciences and the National Basic Research Programme of People of Republic of China.

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