LETTER TO THE EDITOR

Anticipatory anhedonia in schizophrenia subjects

L’anhédonie anticipatoire dans les schizophrénies

Dear Editors,

The distinction between the experience of pleasure related either to online experience in response to a specific stimulus (consummatory pleasure) or to future pleasurable activities (anticipatory pleasure) has been proposed by Klein [7] in a theoretical paper. Recently, accumulated evidence across disciplines has suggested that anticipatory can be differentiated from consummatory pleasure (see review in [4]).

Anhedonia, the lowered ability to experience pleasure, is one of the main symptoms of schizophrenia and patients report experiencing lower levels of pleasure than controls on self-report trait measures and in semi-structured interviews [6]. Moreover, patients report experiencing as much pleasant emotion as controls in response to emotionally evocative stimuli [8]. Based on neurobehavioral distinctions between liking and wanting [2], Gard et al. [4] have proposed that schizophrenia patients experience normal levels of pleasure when directly engaged in an enjoyable activity, or consummatory pleasure (i.e., liking), but experience disturbances in the experience of pleasure related to future activities, or anticipatory pleasure (i.e., wanting).

Using complementary methods, Gard et al. [5] reported that schizophrenia patients reported as much pleasure in the moment as controls in their daily lives and on a measure of trait consummatory pleasure (consummatory subscale of the Temporal Experience of Pleasure Scale, TEPS-CONS) but the schizophrenia patients reported experiencing less trait pleasure in anticipation of future events (anticipatory subscale of the TEPS, TEPS-ANT) compared to healthy controls.

The aim of the present study was firstly to replicate the Gard et al. study [5] using the French version of the TEPS and secondly to test the specificity of this deficit in schizophrenia as well as the potential influence of depression on the consummatory and anticipatory trait pleasure reported in schizophrenia.

One hundred and twenty-five university students (15 males, 110 females, mean age = 21.31 years, S.D. = 4.67) of the University of Picardie were recruited. One hundred and sixty-two inpatients with either schizophrenia (n = 43, 30 males, 13 females, mean age = 42 years, S.D. = 12.57) or mood, neurotic or personality disorders (n = 119, 31 males, 88 females, mean age = 40.78, S.D. = 12.82) were included from the department of psychiatry of the University Hospital of Amiens or Lille. Diagnoses were confirmed using the structured clinical interview for ICD-10 [10]. Exclusion criteria were: current alcohol or substance abuse, severe organic disease or poor fluency in French. All patients were taking medication, atypical or typical antipsychotics for schizophrenic patients and antidepressants or anxiolytics for the other patients. The study was approved by our local ethics committee and participants gave written informed consent to participate.

All participants completed the French versions of the following rating scales:

- the 18-item Temporal Experience of Pleasure Scale (TEPS, [4]);
- the 61-item revised Physical (PAS);
- the 40-item Social Anhedonia (SAS) scales [3];
- the 14-item Snaith Hamilton Pleasure Scale (SHAPS, [9]);
- the 21-item Beck Depression Inventory-II (BDI-II, [1]);
- we also created PAS anticipatory (PAS-ANT) and PAS consummatory (PAS-CONS) scales from the university student sample using the correlations between the items of the PAS and the TEPS-CONS or TEPS-ANT scales.

To create a PAS-CONS item, two conditions were necessary: a correlation of at least 0.15 with the TEPS-CONS and a difference of at least 0.10 and not of at least 10 between the correlation of the item with the TEPS-CONS and the correlation of the item with the TEPS-ANT. The same method was applied for the PAS-ANT. Respectively 10 and 16 items were retained for the PAS-ANT and PAS-CONS.
Firstly, we examined the construct, concurrent validities and reliability of the TEPS using respectively confirmatory factorial analyses (CFA) to test the two-factor structure of the TEPS, Pearson’s correlations between the 10-item TEPS-ANT or 8-item TEPS-CONS and the other anhedonia scales and Cronbach’s alpha coefficients.

Secondly, we compared the three groups (university students, schizophrenia subjects, other psychiatric subjects) using analyses of variance (ANOVA) on the measures of anticipatory and consummatory anhedonias. However, multivariate analyses of variance (MANOVA) or covariance (ANCOVA) were completed as the three groups were significantly different on age and sex-ratio.

For the results of the CFA, we used three parameters to test the adequacy of the data to the model: the normed Chi² (the ratio of Chi² to its degree of freedom, \( \chi^2/df \) ratio < 5 and preferably < 2), the root mean square residual (RMSR < 0.10) and the root mean square error of approximation (RMSEA < 0.08). The three parameters were respectively for the university and psychiatric samples: 1.66, 0.09, 0.074 and 2.19, 0.09, 0.087.

Cronbach’s alpha, mean inter-item correlation, and correlations between the scales for the university students and psychiatric sample is reported in Table 1.

Cronbach’s alpha coefficients were satisfactory (> 0.7) for the TEPS-ANT but the mean inter-item correlations, that are independent of the length of the scales and allowing the comparison of the reliabilities, were satisfactory (> 0.15) for the TEPS-CONS.

Significant correlations were observed between either the TEPS-CONS or the TEPS-ANT and the anhedonia scales suggesting satisfactory concurrent validities.

Kruskal-Wallis ANOVA reported significant difference between groups for the TEPS-ANT (\( \chi^2 = 13.09, df = 2, p = 0.0014 \)) but not for the TEPS-CONS (\( \chi^2 = 1.87, df = 2, p = 0.39 \)). Similar results were observed using the PAS-ANT and PAS-CONS. Controlling for sex-ratio, age and score of the BDI-II using MANOVA and ANCOVA did not modify the results.

The French version of the TEPS had satisfactory psychometric properties and replicated the Gard et al. study reporting that schizophrenic subjects had lower anticipatory pleasure than healthy controls but did not differ on consummatory pleasure. Our replication used not only TEPS subscales but also anticipatory and consummatory subscales extracted from the PAS.

Moreover, the difference on anticipatory pleasure between healthy and schizophrenic subjects was independent of depression, and there was no difference between schizophrenic subjects and non-schizophrenic psychiatric controls concerning anticipatory pleasure.

Further studies are needed to explore the hypothesis that specific subgroups of schizophrenic subjects (e.g., deficit schizophrenic subjects) could be more anhedonic in either form of anhedonia (anticipatory and/or consummatory anhedonia); additionally further comparisons should be made with psychiatric controls without a schizophrenia diagnosis.

### Table 1

<table>
<thead>
<tr>
<th>University students (n = 125)</th>
<th>Psychiatric sample (n = 162)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEPS-ANT</td>
<td>TEPS-CONS</td>
</tr>
<tr>
<td>0.85</td>
<td>0.83</td>
</tr>
<tr>
<td>1</td>
<td>0.42</td>
</tr>
<tr>
<td>0.42</td>
<td>1</td>
</tr>
<tr>
<td>PAS</td>
<td>-0.34</td>
</tr>
<tr>
<td>SAS</td>
<td>-0.25</td>
</tr>
<tr>
<td>SHAPS</td>
<td>-0.14</td>
</tr>
<tr>
<td>BDI-II</td>
<td>0.06</td>
</tr>
<tr>
<td>PAS-ANT</td>
<td>-0.52</td>
</tr>
<tr>
<td>PAS-CONS</td>
<td>-0.19</td>
</tr>
</tbody>
</table>

TEPS: the 18-item Temporal Experience of Pleasure Scale; TEPS-ANT: the 10-item anticipatory subscale of the TEPS; TEPS-CONS: the 8-item consummatory subscale of the TEPS; PAS: the 61-item revised physical anhedonia scale; SAS: the 41-item social anhedonia scale; SHAPS: the 14-item Snaith Hamilton Pleasure Scale; BDI-II: the 21-item Beck Depression Inventory; PAS-ANT: the 10-item anticipatory subscale of the PAS; PAS-CONS: the 16-item consummatory subscale of the PAS; Alpha: Cronbach’s alpha coefficient; Mic: Mean inter-item correlation; in boldface \( p < 0.05 \).

### References


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