Author's response to reviews

Title: Personality dimensions of schizophrenia patients compared to control subjects by gender and the relationship with illness severity

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Version: 3
Date: 14 May 2014

Author's response to reviews: see over
Dear editor,

Please find, attached, the revised manuscript Ref. MS: 1246219175110940, “Personality dimensions of schizophrenia patients compared to control subjects by gender and the relationship with illness severity,” by Carmen Miralles et al.

In this revised version, we have taken into account all of the comments suggested by the reviewer 3. Our responses are itemized on the accompanying sheets, and where necessary, we have made the appropriate changes in the text.

We hope that the revised version of the manuscript meets the requirements for inclusion in BMC Psychiatry.

Sincerely yours,

Lourdes Martorell, PhD
Reviewer #3 (Lindy-Lou N Boyette) Comments to Author

Title: Personality dimensions of schizophrenia patients compared to control subjects by gender and the relationship with illness severity.

Version: 2 Date: 14 April 2014

Reviewer's report:
In my opinion, the revised manuscript is an improvement from the original draft. In particular, it has improved in readability, specifically, but not limited to, the methods and results sections. However, I still have major concerns, mainly whether the chosen methods fit the authors’ conclusions. At the current stage, I do not feel that my original concerns regarding this matter have been sufficiently addressed.

Major compulsory revisions:
- Patients differ from controls in HA and RD, also when females and males were examined separately. The authors state that ‘the differences (LLB: between patients and controls) were higher and more significant for HA among males and for RD among females’ (Abstract, Results), which seems to be based on an at face-value comparison of the magnitudes of patients-control mean differences, and their subsequent p-values.

Within the control group, males and females differ in HA, RD and C.
Within the patient group, males and females do not differ in any TCI scale.

The authors reported no test whether patients and controls have different TCI scale means depending on gender (= interaction).

Taken together, I do not feel that the current analyses and results justify the authors’ conclusion that ‘schizophrenia patients may have a specific personality profile based on gender’ (Abstract, Result – also main text Conclusions). This has not been demonstrated.

Response to the reviewer: We agree with the reviewer’s comment according the results of the study. Also, it is true that we do not report any statistical test analyzing whether patients and controls have different TCI scale means depending on gender. However, the aim of the study was not to identify whether patients and controls differ in the TCI scale means depending on gender. The aim of the study was to identify
differences in personality dimensions between schizophrenia patients and controls subjects and the analyses were stratified by gender because in the preliminary analyses of the data, three out of the seven TCI-R scales (HA, RD, and C) differed between male and female control subjects, as we report in the manuscript.

We agree with the reviewer that in the Conclusion section of the manuscript it may be daring to indicate that “schizophrenia patients may have a specific personality profile based on gender” and we have removed this sentence from the main text Conclusions section and also from the Results section in the Abstract.

However, we believe that it is important to notice that the differences are greater for HA in the male group rather than in the female group whereas the differences regarding RD are greater in the female group rather than in the male group. This information is maintained in the new version of the manuscript.

And I do not see adequate support for specific personality profiles for schizophrenia patients in which RD is not mentioned for males and HA is not mentioned for females (Abstract, Results & Abstract, Conclusions, as well as Text, Conclusions). To a reader, this implies that male patients do not differ in RD from male controls, and female patients do not differ in HA from female controls- which they in fact do. There may be smaller or larger differences in HA and RD between patients and controls for males or females, but to come to this conclusion, this should be the results of statistical analyses (I would say: demonstrated interaction between gender and group status in a two-way MANOVA for HA and RD). To meet publication standards, the authors should provide more substantial evidence for their claim that schizophrenia patients may have specific personality profiles based on gender. I’m afraid this cannot be avoided, since this constitutes one of their main conclusions.

Response to the reviewer: We agree with the reviewer and we do not mention in the new version that there is a specific personality profile for schizophrenia patients based on gender. In the new version of the manuscript, it is clearly indicated that male and female schizophrenia patients differed from their respective controls in HA, RD, SD, C, and ST.

We also did the two-way MANOVA analyses for HA and RD as suggested by the reviewer.

The results retrieved from the SPSS are the following:
GLM HA RD BY gender case_control

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/CONTRAST(case_control)=Helmert
/METHOD=SSTYPE(1)
/INTERCEPT=INCLUDE
/PLOT=PROFILE(case_control*gender)
/EMMEANS=TABLES(gender)
/EMMEANS=TABLES(gender)
/EMMEANS=TABLES(gender*case_control)
/PRINT=DESCRIPTIVE RSSCP HOMOGENEITY
/CRITERIA=ALPHA(.05)
/DESIGN= gender case_control gender*case_control.

Descriptive statistics

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<thead>
<tr>
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<th>case or control</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA</td>
<td>Female</td>
<td>control</td>
<td>98.07</td>
<td>17.205</td>
</tr>
<tr>
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<td>patient</td>
<td>105.95</td>
<td>19.097</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>101.11</td>
<td>18.297</td>
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<td></td>
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<td>control</td>
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<tr>
<td></td>
<td></td>
<td>patient</td>
<td>106.96</td>
<td>20.158</td>
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<tr>
<td></td>
<td></td>
<td>Total</td>
<td>98.64</td>
<td>19.164</td>
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<td></td>
<td>Total</td>
<td>control</td>
<td>94.14</td>
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<td></td>
<td>patient</td>
<td>106.64</td>
<td>19.774</td>
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<td></td>
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<td>18.876</td>
</tr>
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<td>16.012</td>
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</table>

Box test on the equality of covariance matrices

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>M of Box</td>
<td>23,365</td>
</tr>
<tr>
<td>F</td>
<td>2,567</td>
</tr>
<tr>
<td>gl1</td>
<td>9</td>
</tr>
<tr>
<td>gl2</td>
<td>395057,077</td>
</tr>
<tr>
<td>Sig.</td>
<td>.006</td>
</tr>
</tbody>
</table>

The null hypothesis that the observed covariance matrices of the dependent variables are equal across groups is tested.

* Design: Intercept + gender + case_control + gender * case_control
Bartlett’s test of sphericity

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Df.</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood ratio</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi-square approx.</td>
<td>24,883</td>
<td>2</td>
<td>.000</td>
</tr>
</tbody>
</table>

The null hypothesis that the residual covariance matrix proportional to an identity matrix is tested.

a. Design: Intercept + gender + case_control + gender * case_control

Multivariate contrasts

<table>
<thead>
<tr>
<th>Effect</th>
<th>Pillai’s trace</th>
<th>Lambda of Wilks</th>
<th>Hotelling’s trace</th>
<th>Roy’s greatest root</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.990</td>
<td>18457,119^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Lambda of Wilks</td>
<td>.010</td>
<td>18457,119^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Hotelling’s trace</td>
<td>99,768</td>
<td>18457,119^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Roy’s greatest root</td>
<td>99,768</td>
<td>18457,119^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>gender</td>
<td>.069</td>
<td>13,732^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Lambda of Wilks</td>
<td>.931</td>
<td>13,732^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Hotelling’s trace</td>
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<td>13,732^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Roy’s greatest root</td>
<td>.074</td>
<td>13,732^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>case_control</td>
<td>.135</td>
<td>28,920^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Lambda of Wilks</td>
<td>.865</td>
<td>28,920^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Hotelling’s trace</td>
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<td>28,920^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Roy’s greatest root</td>
<td>.156</td>
<td>28,920^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>gender * case_control</td>
<td>.023</td>
<td>4,366^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
<tr>
<td>Lambda of Wilks</td>
<td>.977</td>
<td>4,366^a</td>
<td>2,000</td>
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<tr>
<td>Hotelling’s trace</td>
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<td>4,366^a</td>
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<tr>
<td>Roy’s greatest root</td>
<td>.024</td>
<td>4,366^a</td>
<td>2,000</td>
<td>370,000</td>
</tr>
</tbody>
</table>

a. Statistical exact
b. Design: Intercept + gender + case_control + gender * case_control

Levene’s test for homogeneity of variance

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>gl1</th>
<th>gl2</th>
<th>Sig.</th>
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</thead>
<tbody>
<tr>
<td>HA</td>
<td>2,199</td>
<td>3</td>
<td>371</td>
<td>.088</td>
</tr>
<tr>
<td>RD</td>
<td>1,791</td>
<td>3</td>
<td>371</td>
<td>.148</td>
</tr>
</tbody>
</table>

The null hypothesis that the error variance of the dependent variable is equal across all groups is tested.

a. Design: Intercept + gender + case_control + gender * case_control
### Tests of between-subjects effects

<table>
<thead>
<tr>
<th>Origen</th>
<th>Dependent variable</th>
<th>Type I sum of squares</th>
<th>Df.</th>
<th>Mean squared</th>
<th>F</th>
<th>Sig.</th>
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<tbody>
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<td>3622.806</td>
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<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>HA</td>
<td>3713213.526</td>
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<td>3713213.526</td>
<td>11787.836</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>RD</td>
<td>4083640.662</td>
<td>1</td>
<td>4083640.662</td>
<td>17819.130</td>
<td>.000</td>
</tr>
<tr>
<td>gender</td>
<td>HA</td>
<td>525.009</td>
<td>1</td>
<td>525.009</td>
<td>1.667</td>
<td>.198</td>
</tr>
<tr>
<td></td>
<td>RD</td>
<td>5102.555</td>
<td>1</td>
<td>5102.555</td>
<td>22.265</td>
<td>.000</td>
</tr>
<tr>
<td>case_control</td>
<td>HA</td>
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<tr>
<td></td>
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<td>4971.221</td>
<td>21.692</td>
<td>.000</td>
</tr>
<tr>
<td>gender * case_control</td>
<td>HA</td>
<td>1106.022</td>
<td>1</td>
<td>1106.022</td>
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<td>.062</td>
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<tr>
<td></td>
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<td>3.467</td>
<td>.063</td>
</tr>
<tr>
<td>Error</td>
<td>HA</td>
<td>116866.424</td>
<td>371</td>
<td>315.004</td>
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<tr>
<td></td>
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<td>85022.707</td>
<td>371</td>
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<tr>
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<td>HA</td>
<td>3846470.704</td>
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<tr>
<td></td>
<td>RD</td>
<td>4179531.787</td>
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<tr>
<td>Total corrected</td>
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<td>133257.179</td>
<td>374</td>
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<td></td>
<td>RD</td>
<td>95891.126</td>
<td>374</td>
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</tbody>
</table>

- a. $R^2 = .123$ (R squared corrected = .116)
- b. $R^2 = .113$ (R squared corrected = .106)

### Estimated marginal means

1. gender

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>gender</th>
<th>Mean</th>
<th>SR.</th>
<th>Confidence interval 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower limit</td>
</tr>
<tr>
<td>HA</td>
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<td>102.009</td>
<td>1.586</td>
<td>98.890</td>
</tr>
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<td></td>
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<td>.976</td>
<td>99.469</td>
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</table>

2. case_control

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>case_control</th>
<th>Mean</th>
<th>SR.</th>
<th>Confidence interval 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower limit</td>
</tr>
<tr>
<td>HA</td>
<td>control</td>
<td>94.911</td>
<td>1.251</td>
<td>92.452</td>
</tr>
<tr>
<td></td>
<td>patient</td>
<td>106.454</td>
<td>1.503</td>
<td>103.498</td>
</tr>
<tr>
<td>RD</td>
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<td>106.800</td>
</tr>
<tr>
<td></td>
<td>patient</td>
<td>100.546</td>
<td>1.282</td>
<td>98.024</td>
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</table>
### 3. Gender * cas o control

<table>
<thead>
<tr>
<th>Dependent variable</th>
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<th>case_control</th>
<th>Mean</th>
<th>SR.</th>
<th>Lower limit</th>
<th>Lower limit</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1,972</td>
<td>94,192</td>
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<td></td>
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<td>2,485</td>
<td>101,061</td>
<td>110,835</td>
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<tr>
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<td>94,778</td>
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<td></td>
<td></td>
<td>patient</td>
<td>106,960</td>
<td>1,692</td>
<td>103,632</td>
<td>110,287</td>
</tr>
<tr>
<td>RD</td>
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<td>control</td>
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</tr>
<tr>
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<td>1,313</td>
<td>101,429</td>
<td>106,591</td>
</tr>
<tr>
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<td></td>
<td>patient</td>
<td>98,764</td>
<td>1,443</td>
<td>95,925</td>
<td>101,602</td>
</tr>
</tbody>
</table>

As it can be observed, the contrast of the overall multivariate hypothesis shows significant differences in the covariance matrix in each of the factors (gender and case / control) and their interaction (F = 4.366; Po 0.013, Pillai's Trace = 0.023) (Multivariate contrasts). Next, the Levene’s test shows the homogeneity of variance. Therefore, we proceed with the distinct ANOVA analyses (tests of between-subjects effects). As it can be observed, gender independently affects RD scores, case-control variable independently affects HA and RD, however the interaction did not reach statistical significance. This confirms our initial hypothesis and justifies the original procedure for stratifying the sample by gender. In our opinion, the results that are of interest for the readers are given in the last table retrieved by the General Lineal Model and these results are the same that are included in the Table 2 of the manuscript. In our opinion, the t-test is the appropriate statistical test for comparing male controls versus male patients and female controls versus female patients. Therefore, to stratify the sample by gender at the beginning of the analyses, because of the different TCI-R scores between male and female controls according to HA, RD, and C, led us to the same results.

- Some important psychometric characteristics, namely reliability, factor structure and – above all- temporal stability, of the TCI have not yet been examined in schizophrenia patients, which at the least should be noted as a limitation. This limitation is especially important because the authors report correlations with clinical features that have occurred before TCI assessment. In the current form, the authors cannot rule out that the current TCI scores of patients have been affected by course of illness. The authors
cannot even rule out that the present clinical state may affect TCI scores in patients. The authors' counterargument that 'no prominent symptoms were present' (Limitations of the study) would be more convincing if psychotic symptom levels had actually been assessed. Perhaps there were no severe positive symptoms apparent, but positive symptoms may still have been present to some extent, as well as negative symptoms, or common comorbidities such as depression. In other words, they may in fact be finding that, not personality, but severity of illness is correlated to severity of illness. This possibility should also be noted as a limitation.

**Response to the reviewer:** We agree with the reviewer that important psychometric characteristics of the TCI-R used in the present study have not been examined in schizophrenia patients. However, it is worth mentioning that the TCI-140 (the short version of the TCI-R which presents correlations ranging from 0.91 (Self-Directedness) to 0.97 (Self-Transcendence) with the TCI-R) has been examined in a psychiatric in-patients with differential Axis I and II diagnoses. Reliability for the TCI-R in these patients was established between 0.76 and 0.87 (Gutiérrez-Zotes et al. *Actas Esp Psiquiat.* 2005, 33(4):231-7). However, in the new version of the manuscript we mention in the *Limitations of the study* section that “a third limitation is that psychometric TCI properties such as reliability, factor structure and temporal stability could not be taken into account because they have not been extensively evaluated in psychotic patients.”.

According to the putative effect of the present clinical state on the TCI scores, we agree with the reviewer’s comment and we have added a limitation in this sense. Therefore, we have modified the paragraph regarding this aspect in the *Limitations* section. We now indicate “The second limitation of the study is that the symptomatology of patients was not assessed. Although patients were only evaluated when they were clinically stable and no prominent symptoms were present, we cannot rule out that psychotic symptoms were likely present and may have influenced the scores of personality dimensions as previously reported (11-12, 18, 24, 50-51).”

**Minor essential revisions:**

- It may be due to a technical problem (I’m using Word 10), but Figure 1 was not visible to me. Also, Table 3 did not show a line explaining which columns are male subjects and which columns are female subjects.
Response to the reviewer: Text of figure 1 is Arial 13 and Title is Arial 15. We think that the journal will ask us whether it is necessary to make any modification.

We agree that Table 3 did not show the gender in the corresponding columns and this have been added in the new version of the manuscript.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests: I declare that I have no competing interests