# University students' psychopathology: correlates and the examiner's potential bias effect

## Psicopatologia em estudantes universitários: correlatos e o efeito de enviesamento potencial do examinador

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Palavras-Chave
Dissociação
Avaliador
Sintomas psicopatológicos
Estudantes
Factores sociodemográficos

## RESUMO

**Contexto:** Os sintomas psicopatológicos são muito comuns em estudantes universitários de diferentes culturas, mas os correlatos sociodemográficos são diferentes consoante os estudos. Adicionalmente, os correlatos em estudantes portugueses não foram ainda estudados de forma aprofundada, para além de que se levantam questões metodológicas neste tipo de estudos, no sentido de que não tem sido descrito quem faz as avaliações psicológicas.
**Objetivos:** O principal objetivo desta pesquisa foi verificar se existe diferença nos sintomas psicopatológicos entre dois grupos avaliados por dois examinadores diferentes, controlando o papel potencial da desejabilidade social, e de outras covariáveis eventuais. Além disso, queremos determinar o nível de psicopatologia e os seus correlatos sociodemográficos.
**Métodos:** Cento e oitenta e cinco estudantes universitários de Coimbra completaram o Inventário Breve de Sintomas/IBS e a Escala de Desejabilidade Social de Marlowe-Crowne. Num grupo, o examinador era da mesma idade e do mesmo estatuto académico que os alunos, enquanto no outro grupo o examinador era mais velho e professor. Estudámos as associações psicopatológicas através de correlações de Pearson e ponto bisserial e análises qui-quadrado, e controlámos o papel potencial das covariáveis através de ANCOVAs não-paramétricas de Quade.
**Resultados:** O nível de sofrimento foi menor em comparação com outras investigações. As mulheres apresentaram maior nível de sofrimento e mais sintomas de somatização, ansiedade, ansiedade fóbica, obsessivo-compulsivos e de depressão. Os alunos que moram mais longe tiveram mais ansiedade e sintomas obsessivo-compulsivos. O grupo avaliado pelo examinador mais jovem pontuou mais no índice de sofrimento e em alguns fatores do IBS, e tiveram níveis inferiores na desejabilidade social.
**Conclusões:** O sexo e distância de casa parecem fatores importantes para a saúde mental de estudantes universitários. No entanto, o examinador influencia a avaliação, provavelmente por causa da desejabilidade social, sugerindo que as características do examinador devem ser fornecidas em investigações envolvendo estudantes universitários.

Keywords
Dissociation
Examiner
Psychopathological symptoms
Students
Socio-demographic factors

## ABSTRACT

**Background:** Psychopathological symptoms are very common among university students from different cultures, but the socio-demographic correlates that have been found are different depending on the studies. The correlates of such symptoms among Portuguese students have not been studied thoroughly, besides the methodological issues that arise in this type of studies, in the sense that has not been described who does the psychological evaluations.
**Aims:** the main objective was to verify if there is a difference on psychopathological symptoms between two groups questioned by two different examiners, controlling for the potential role of social desirability, and other potential covariates. Additionally, we want to assess the level of psychopathology and its socio-demographic correlates.
**Methods:** 185 Coimbra's university students completed the Brief Symptom Inventory/BSI and the Marlowe-Crowne Social Desirability Scale. In one group the examiner was of the same age and academic status as the students, while in the other group the examiner was older and a teacher. We studied the psychopathological correlates with Pearson, point-biserial correlations, and qui-square analyses, and we controlled the potential role of covariates through Quade non-parametric ANCOVAs.
**Results:** The level of distress was lower in comparison with other investigations. Women had higher level of distress and more symptoms of somatization, anxiety, phobic anxiety, obsessive-compulsion, and depression. The students that live a higher distance from home had more anxiety and obsessive-compulsive symptoms. The group assessed by the younger examiner scored higher in distress and in some BSI factors, and had lower levels on social desirability.
**Conclusions:** Sex and distance from home seem important factors for university students' mental health. However, the examiner does have an influence in the evaluation, probably because of social desirability, suggesting that the examiner's characteristics should be given in investigations involving university students.
neuropsychological tests for dementia diagnosis.

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## INTRODUCTION

It is among young adults, particularly university students, that most psychopathological symptoms are found (Mackenzie et al., 2011; Mowbray et al., 2006), probably resulting from the transition from one social role to another major social role (Parker, Summerfeldt, Hogan, & Majeski, 2004; Taylor, Doane, & Eisenberg, 2013); to the potential changes in lifestyle, friends, responsibilities, and geographical residence involved in this transition (Taylor et al., 2013); to the greater number of university students of diverse origins, some with economic disadvantages (Almeida, Soares, & Ferreira, 2001; Kitzrow, 2003); and to the vulgarization of alcohol use behaviors among this population (Corbin, Iwamoto, & Fromme, 2011; Greenbaum, Del Boca, Darkes, Wang, & Goldman, 2005).

Many students starting university appear to have personal and academic problems, which through the years has led to a significant body of research documenting psychopathological symptoms in this population (Allgöwer, Wardle, & Steptoe, 2001; Almeida et al., 2001; Gonçalves, 2010; Greenbaum et al., 2005; Hoyt & Yeater, 2010; Jensen, 2003; Kitzrow, 2003; J. D. Parker et al., 2004; Santos, Pereira, & Veiga, 2009; Schwartz, 2006; Vannucci & Mazzoni, 2006; Zawadzki, Graham, & Gerin, 2013; Zoroglu et al., 2003). These problems seem to be particularly critical in the first year of university (Cooke, Bewick, Barkham, Bradley, & Audin, 2006; Guo, Huang, Liu, & Wang, 2013; Read et al., 2012; Silveira, 2012), and amongst medical students (e.g., Roberto & Almeida, 2011; Silveira, 2012).

Albeit some present a trend of decreasing rates of students' illness (review of Kraft, 2006), the high incidence of mental health problems among university students is consistent across different cultures (e.g., Guo et al., 2013; Hozoori & Barahmand, 2013; Mackenzie et al., 2011; Nur, Cetinkaya, Sabanciogullari, Ozsahin, & Kavakci, 2008; Roberto & Almeida, 2011; Steptoe, Tsuda, Tanaka, & Wardle, 2007; Verger, Guagliardo, Gilbert, Rouillon, & Kovess-Masfety, 2009), pointing to developmental and analogous social aspects of psychopathology.

Most of the studies reviewed above, when assessing mental health, usually disregard the dis/similarity between researcher/examiner and examinees. This is a question often present and took in consideration in other contexts, such as the forensic (e.g., Melton, Petrila, Poythress, & Slobogin, 2007), the counseling (Herring, 2002), or the testing context (Urbina, 2004). In fact, age, gender, socioeconomic status, race or ethnicity, temperament, expectations, proximity to the examinee and behavior during the evaluation, are characteristics of the examiners that seem to affect the results of testing (Ardila, 2005; Schafer, Papapolydorou, Rahman, & Parker, 2005). Additionally, self-report measures are commonly used in mental health research, but they present a potential downside, such as the personal defense acquiescence and the social desirability (deVries, 1992) making the type of the examiner more relevant.

In fact, most of the research studies investigating psychopathology with university students, out of university counseling centers, did not indicate who the examiner was (or his personal characteristics) (e.g., Allgöwer et al., 2001; Greenbaum et al., 2005; Hoyt & Yeater, 2010; Hozoori & Barahmand, 2013; Nur et al., 2008; J. D. Parker et al., 2004; Santos et al., 2009; Schwartz, 2006; Taylor et al., 2013; Vannucci & Mazzoni, 2006; DC WatsonBiren, 1999; Zawadzki et al., 2013), including when validating psychopathological measures (L. S. Almeida et al., 2001; Cochran & Hale, 1985; Frazier & Kaler, 2006; Gutiérrez Wang, Cosden, & Bernal, 2011; Koffel & Watson, 2010; David Watson & Wu, 2005), with rare exceptions (Guo et al., 2013; Vickers et al., 2003).

This research derives from the research of a senior investigator (Espirito-Santo, 2009), followed by the study of a master student (Matreno, 2010). Therefore, we aimed to verify if there was a difference in psychopathological symptoms in the two samples collected by the two different researchers, one older and with a higher academic status, and the other of the same age and academic status as the students. In addition, our secondary goals were to assess the level of psychopathology and its socio-demographic correlates among university students.

## MATERIAL AND METHODS

### Participants

Our target population was the university students from two higher education institutions at Coimbra. The total sample had 185 students, of which 66 (35.7%) were male and 119 (64.3%) female. The average age of the students was 22.29 years (SD = 3.27; range: 18-40) and the average study years was 13.65 (SD = 2.02). These students were attending from 1$^{st}$ to the 5$^{th}$ year of university in Law or Humanities (20.4%), Health and Psychology (54.5%), Social sciences (13.2%), and Engineering areas (12.0%).

The total sample was divided into two groups: one group was evaluated by a professor (Group A), and the other group was evaluated by a researcher of the same age of the examinees (Group B).

The group A was one year older in average (Cohen's d = 0.53), ranging between 18-28 years (Median = 23;

Group B: 10-40, Median = 21). There was also an association between the type of examiner and the civil status, with group A having had significantly fewer participants with a partner (boy/girlfriend or married). Finally, there was an association between the education area and the type of examiner ($X^2 = 33.70$; $p < 0.001$), with Group A having had fewer Law, Humanities and Technology students, and Group B fewer students from Social sciences. The groups had similar numbers of medical students. There were no differences in the year of study between the two groups. Students' demographic characteristics are displayed in Table 1.

**Table 1**

*Socio-demographics of University Students Examined by a Professor (Group A) Versus Examined by a Researcher of the Same Age (Group B)*

| | Group A n = 87 | | Group B n = 98 | | **t,** $X^2$ |
|---|---|---|---|---|---|
| **Variable** | **Mean** (SD) | % (n) | **Mean** (SD) | % (n) | |
| Age (years) | 22.80 (2.62) | | 21.89 (3.71) | | 2.03* |
| Sex | | | | | |
| Female | | 62.1 (54) | | 66.3 (65) | 0.36 |
| Male | | 37.9 (33) | | 33.7 (33) | |
| Civil status | | | | | |
| Without partner | | 92.0 (80) | | 60.2 (59) | 24.87*** |
| With partner | | 8.0 (7) | | 39.8 (39) | |
| Education (years) | 13.84 (2.43) | | 13.35 (1.49) | | 1.62 |
| 1st year | | 42.5 (34) | | 42.6 (40) | 0 |
| ≥ 2nd year | | 57.5 (46) | | 57.4 (54) | |
| Residence distance | | | | | |
| ≤ 1,5 hour | | 74.7 (65) | | 73.5 (72) | |
| ]1.5 - 3] hours | | 9.2 (8) | | 14.3 (14) | 1.50 |
| > 3 hours | | 16.1 (14) | | 12.2 (12) | |

Note: t = Student's t test. $X^2$ = Chi-square test.
* $p < 0.05$; *** $p < 0.001$

## Procedures

Students were recruited from psychology classes, social work classes, and from campus at Miguel Torga University College. We told participants that the primary purpose of the study was to analyze psychopathological symptoms, ensuring the confidentiality and the anonymity of the data collected. Eligible students interested in participating in the study, signed consent forms before completing the questionnaires (they did not received any course extra credit for participating). We collected the data between 2008 and 2010, using a battery of three measures. For this study, we used only two instruments. The respondents were assessed in small group sessions, involving 5 to 15 students in small class/student rooms. We conducted the study in compliance with appropriate internal review board.

## Measures

**A) Demographics.** Participants filled a standard demographic questionnaire asking respondents' age, sex, and year in school.

**B) Brief Symptom Inventory (BSI).** The BSI (Derogatis & Melisaratos, 1983) is a self-reporting inventory used to measure current psychological symptoms and distress during the previous week. It is a Symptom Checklist of 90 items (SCL-90) short version and has been validated for the Portuguese population (Canavarro, 1999). It consists of 53 items on a 5-point Likert response scale, ranging from not at all (0) to extremely (4). When answering, subjects are asked to appraise "the past 7 days including today". It evaluates nine dimensions of symptoms (somatization, interpersonal sensitivity, anxiety, phobic anxiety, psychoticism, obsessive-compulsive, depression, hostility, and paranoid ideation) and three global indices (Global Severity Index, Positive Symptom Total, and the Positive Symptom Distress Index). In the Portuguese version, the author obtained a general population's mean score of 0.84 (SD = 0.48), with the Cronbach's alpha range in the sub-scales from 0.62 to 0.80 (Canavarro, 1999). Our study had a Cronbach's alpha of 0.96 in the total scale.

**C) Marlowe-Crowne-2(10) Social Desirability Scale (MC-2(10)/SDS).** The MC-2(10)/SDS (Strahan & Gerbasi, 1972) is a short form of Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) with 10 items.

The MC-2(10)/SDS gives an estimate of socially desirable responses as a potential source of evaluation errors. The total scores range from 0 to 10, with higher scores related to more socially desirable responses (Strahan & Gerbasi, 1972). In our study, we obtained a Cronbach's alpha of 0.53 (acceptable in short forms (Barger, 2002).

### Statistical analysis

We used the Statistical Package for Social Sciences (SPSS® 21.0 for Mac; SPSS Inc. 2012) to perform data analysis. We used the Kolmogorov-Smirnov test to check the normality of distribution and thus make suitable statistical decisions.

We converted raw BSI sub-scale scores to T-scores to understand if the levels of distress were clinically relevant. We compared the two groups of students using the average scores of psychopathological symptoms, and to do so we employed the Mann-Whitney U test. For comparisons between the two groups using percentage results, we used as appropriate with either the Pearson chi-square test or the Fisher's exact test.

We used Pearson, point-biserial correlations, and qui-square analysis to explore the presence of associations between the BSI sub-scales and the continuous (age and education years) and dichotomized socio-demographic variables (gender, civil status, and education year: 1$^{st}$ year/≥2$^{nd}$ year).

The effect of examiner on psychopathological symptoms was controlled for covariates age, sex, civil status, education years, education area, and residence distance through the Quade non-parametric ANCOVA (Marôco, 2014). This methodology was used because there were differences in these covariates between the two groups, and because they have a potential role on psychopathology (e.g., Shapiro & Keyes, 2008; Springer, Pudrovska, & Hauser, 2011).

A probability value of $p < 0.05$ was considered to be statistically significant.

As currently recommended (e.g., Wilkinson & The Task Force on Statistical Inference, 1999), we focused on effect sizes versus statistical significance and reported both the amount of variance accounted for by group ($\eta^2$) for the five domains, and standardized mean differences (Cohen's d) for the separate variables. Partial eta-squared for the ANOVA was calculated accordingly to the following formula: $\eta^2 = [F (k - 1)] / [F (k - 1) + (N - k)]$, where F is the ANOVA values, and k the number of groups (Richardson, 2011, p. 138). For interpreting partial eta-squared, 0.01 is a small effect, 0.06 is a medium effect, and 0.14 is a large effect (Ellis, 2010; Richardson, 2011). For Cohen d, 0.2 is small, 0.5 is medium, and 0.8 is large (Cohen, 1988; Ellis, 2010).

## RESULTS

### Descriptive

The subjects' BSI sub-scales scores and MC-2(10)/SDS score, and, respectively, the percentages showing clinically significant levels of distress and high levels of desire of social acceptance (T-scores > 60) are summarized in Table 2.

**Table 2**

*Brief Symptom Inventory (BSI) Sub-scales and Marlowe-Crowne Social Desirability Scale MC-2(10)/SDS: Mean Raw Scores and Percentages of T-scores > 60*

| | Mean Raw Scores | | T-scores > 60 |
|---|---|---|---|
| | M | SD | % |
| BSI | | | |
| Somatization | 0.39 | 0.48 | 10.4 |
| Interpersonal sensitivity | 0.72 | 0.60 | 13.0 |
| Anxiety | 0.66 | 0.54 | 12.8 |
| Phobic anxiety | 0.33 | 0.44 | 14.1 |
| Psychoticism | 0.51 | 0.50 | 13.5 |
| Obsessive-compulsive | 0.97 | 0.61 | 15.7 |
| Depression | 0.66 | 0.55 | 15.6 |
| Hostility | 0.76 | 0.61 | 16.8 |
| Paranoia | 0.80 | 0.61 | 14.4 |
| Global Severity Index | 0.64 | 0.43 | 14.1 |
| Positive Symptom Total | 23.69 | 12.18 | 17.6 |
| Positive Symptom Distress Index | 1.35 | 0.32 | 15.3 |
| MC-2(10)/SDS | 5.35 | 1.96 | 14.4 |

Note: M = mean; SD = Standard Deviation.

After removing the subjects that had T-scores above 60 on MC-2(10)/SDS, the BSI sub-scales scores became slightly lower (the difference range from 0.06 to 0.2 for all sub-scales, and 1.58 for Positive Symptom Total, with $t_{paired} = 1.77$, $p = 0.104$).

## Correlates

Sex correlated with Global Severity Index ($r = 0.16$, $p < 0.05$), and symptoms of somatization ($r = 0.15$, $p < 0.05$), anxiety ($r = 0.20$, $p < 0.01$), phobic anxiety ($r = 0.20$, $p < 0.01$), obsessive-compulsion ($r = 0.21$, $p < 0.01$), and depression ($r = 0.24$, $p < 0.01$), with women having more symptoms (Global Severity Index women: M ± DP = 0.70 ± 0.47; Global Severity Index men: M ± DP = 0.53 ± 0.32; $t = 2.63$; $p = 0.009$; $d = 0.42$).

Civil status, and education years correlated only with phobic anxiety (respectively, $r = 0.20$, $p < 0.01$; $\varrho = -0.16$, $p < 0.01$), with those that had no partners (no partner: M ± DP = 0.28 ± 0.39; with partner: M ± DP = 0.45 ± 0.55; $t = 2.24$; $p = 0.026$; $d = 0.64$) and those with less education having more phobic symptoms.

Residence distance correlated with anxiety and obsessive-compulsive symptoms (respectively, $r = 0.16$, $p < 0.05$; $r = 0.15$, $p < 0.05$): the longer the distance, more the symptoms.

Course year (1st year/≥2nd year), and years of age did not correlated with any BSI subscales.

There was an association between education area and some symptoms: interpersonal sensitivity ($X^2 = 15.59$; $p < 0.01$; social sciences: 54.5% above cut-off value), obsessive-compulsive ($X^2 = 13.12$; $p < 0.01$; Law and humanities: 35.3% above cutoff value), hostility ($X^2 = 10.31$; $p < 0.05$; Law and humanities: 38.2% above cutoff value).

## Comparisons

In Table 3, we can see the average scores and the standard deviations of the two instruments in the two groups defined by the examiner. We can also verify that there were significant differences between both groups in five sub-scales (Global Severity Index, phobic anxiety, psychoticism, obsessive-compulsive, and Positive Symptom Distress Index).

Inspection of Table 3 shows that Group B got an average score of 0.74 (SD = 0.50) in the Global Severity Index accessed by the BSI, which was significantly higher than that of Group A (M ± SD = 0.53 ± 0.28). However, regarding the BSI factors, there were only significant differences in phobic anxiety ($p = 0.001$), psychoticism ($p = 0.03$) and obsessions ($p = 0.01$). However, we found significant differences in Positive Symptom Distress Index. We did not find significant differences between groups ($t = -1.46$; $p = 0.148$) on the MC-2(10)/SDS.

After controlling the effects of covariate age, statistical differences were maintained in Global Severity Index scores [$F_{Non\text{-}parametric\ ANCOVA}(1,183) = 4.50$; $p < 0.05$; $\eta^2 = 0.02$], in phobic symptoms [$F_{Non\text{-}parametric\ ANCOVA}(1,183) = 10.35$; $p < 0.01$; $\eta^2 = 0.05$], in psychotic symptoms [$F_{Non\text{-}parametric\ ANCOVA}(1,183) = 9.17$; $p < 0.01$; $\eta^2 = 0.05$], in obsessive-compulsive symptoms [$F_{Non\text{-}parametric\ ANCOVA}(1,183) = 12.04$; $p < 0.01$; $\eta^2 = 0.06$], and in Positive Symptom Distress Index [$F_{Non\text{-}parametric\ ANCOVA}(1,183) = 11.54$; $p < 0.01$; $\eta^2 = 0.06$].

**Table 3**

*BSI Subscales and MC-2(10)/SDS: Differences of the Average Scores Between the Group examined by a Teacher (Group A) and the Group Examined by a Researcher of the Same Age of Examinees (Group B)*

| | Group A (n = 98) | | Group B (n = 87) | | *U* | *d* |
|---|---|---|---|---|---|---|
| **Variable** | **M** | **SD** | **M** | **SD** | | |
| BSI | | | | | | |
| Somatization | 0.29 | 0.29 | 0.49 | 0.58 | 3657.0 | 0.44 |
| Interpersonal sensitivity | 0.64 | 0.45 | 0.79 | 0.71 | 4010.0 | 0.25 |
| Anxiety | 0.54 | 0.34 | 0.77 | 0.65 | 3618.0 | 0.44 |
| Phobic anxiety | 0.20 | 0.27 | 0.44 | 0.53 | 3072.0** | 0.57 |
| Psychoticism | 0.36 | 0.31 | 0.65 | 0.59 | 3198.5** | 0.62 |
| Obsessive-compulsive | 0.78 | 0.43 | 1.14 | 0.69 | 3004.5** | 0.63 |
| Depression | 0.56 | 0.40 | 0.74 | 0.65 | 3839.5 | 0.33 |
| Hostility | 0.66 | 0.45 | 0.85 | 0.71 | 3809.5 | 0.32 |
| Paranoia | 0.72 | 0.50 | 0.88 | 0.69 | 3834.0 | 0.27 |
| Global Severity Index | 0.53 | 0.28 | 0.74 | 0.50 | 3405.0*** | 0.64 |
| Positive Symptom Total | 21.98 | 10.92 | 25.21 | 13.06 | 3703.0 | 0.27 |
| Positive Symptom Distress Index | 1.24 | 0.18 | 1.45 | 0.39 | 2929.5*** | 0.69 |
| MC-2(10)/SDS | 5.49 | 1.95 | 4.83 | 1.95 | 901.0 | 0.34 |

Note: SD = Standard Deviation; U = Mann-Whitney's U test; d = Cohen's d. BSI = Brief Symptom Inventory, MC-2(10)/SDS = Marlow-Crowe Social Desirability Scale. ** Significant differences at 0.01 level; ***Significant differences at 0.001 level.

After adjusting the effect of covariate sex, statistical differences were maintained in Global Severity Index [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 5.39; $p < 0.05$; $\eta^2 = 0.03$], in phobic symptoms [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 12.17; $p < 0.01$; $\eta^2 = 0.06$], psychotic symptoms [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 8.94; $p < 0.01$; $\eta^2 = 0.05$], in obsessive-compulsive symptoms [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 12.47; $p < 0.01$; $\eta^2 = 0.06$], and in Positive Symptom Distress Index [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 12.93; $p < 0.001$; $\eta^2 = 0.07$).

After adjusting the effect of covariate civil status, statistical differences were maintained in Global Severity Index [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 7.08; $p < 0.01$; $\eta^2 = 0.04$], in phobic symptoms [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 8.65; $p < 0.01$; $\eta^2 = 0.05$], psychotic symptoms [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 12.57; $p < 0.001$; $\eta^2 = 0.06$], in obsessive-compulsive symptoms [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 13.33; $p < 0.001$; $\eta^2 = 0.07$], but not in Positive Symptom Distress Index [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 0.89; $p = 0.348$; $\eta^2 = 0.009$).

After removing the effects of education area, phobic symptoms [$F_{Non\text{-}parametric\ ANCOVA}$ (1,165) = 6.08; $p < 0.05$; $\eta^2 = 0.04$], psychotic symptoms [$F_{Non\text{-}parametric\ ANCOVA}$ (1,165) = 5.69; $p < 0.05$; $\eta^2 = 0.03$], obsessive-compulsive symptoms [$F_{Non\text{-}parametric\ ANCOVA}$ (1,165) = 8.65; $p < 0.01$; $\eta^2 = 0.05$], and Positive Symptom Distress Index [$F_{Non\text{-}parametric\ ANCOVA}$ (1,165) = 8.51; $p < 0.01$; $\eta^2 = 0.05$] remained statistical different between the two groups, with exception of Global Severity Index [$F_{Non\text{-}parametric\ ANCOVA}$ (1,165) = 2.61; $p = 0.108$; $\eta^2 = 0.02$].

Education years did not affected the differences between the two groups [Global Severity Index: $F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 7.12; $p < 0.01$; $\eta^2 = 0.04$; phobic symptoms: $F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 14.23; $p < 0.001$; $\eta^2 = 0.07$; psychotic symptoms: $F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 10.82; $p < 0.01$; $\eta^2 = 0.06$; obsessive-compulsive symptoms: $F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 15.05; $p < 0.001$; $\eta^2 = 0.08$; Positive Symptom Distress Index [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 14.19; $p < 0.001$; $\eta^2 = 0.07$).

The same happen with residence distance [Global Severity Index: $F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 5.80; $p < 0.05$; $\eta^2 = 0.03$; phobic symptoms: $F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 12.59; $p < 0.001$; $\eta^2 = 0.06$; psychotic symptoms: $F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 9.47; $p < 0.01$; $\eta^2 = 0.05$; obsessive-compulsive symptoms: $F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 13.03; $p < 0.001$; $\eta^2 = 0.07$; Positive Symptom Distress Index [$F_{Non\text{-}parametric\ ANCOVA}$ (1,183) = 13.68; $p < 0.001$; $\eta^2 = 0.07$).

After the removal of the subjects that had T-scores above 60 on MC-2(10)/SDS, the mean differences between the groups defined by the examiner were not statistically significant anymore ($p > 0.05$).

After recoding scores into the two T-scores categories (under and above 60), we encountered significant differences between both groups in all BSI sub-scales (Table 4). It is also worth to note that high levels of social desirability were more prevalent on Group A.

After we removed the subjects that had T-scores above 60 on MC-2(10)/SDS, the significant differences remained for three BSI subscales (Global Severity Index, psychoticism, and Positive Symptom Distress Index; respectively, $X^2 = 5.82$, $p < 0.05$; 5.70, $p < 0.05$; 4.07, $p < 0.05$). The somatization, interpersonal sensitivity, anxiety, phobic anxiety, obsessive-compulsive, depression, hostility, paranoid, and TSP sub-scales were not statistically significant anymore ($p > 0.05$).

**Table 4**

*BSI Subscales and MC-2(10)/SDS: Differences in Percentages of T-scores > 60 Between the Group examined by a Teacher (Group A) and the Group Examined by a Researcher of the Same Age of Examinees (Group B)*

| | Group A (n = 98) | | Group B (n = 87) | | $X^2$ |
|---|---|---|---|---|---|
| **Variable** | **%** | **n** | **%** | **n** | |
| BSI | | | | | |
| Somatization | 2.4 | 2 | 17.6 | 16 | 10.61** |
| Interpersonal sensitivity | 1.3 | 4 | 20.4 | 20 | 10.20** |
| Anxiety | 3.7 | 3 | 20.6 | 20 | 11.41** |
| Phobic anxiety | 5.7 | 5 | 21.4 | 21 | 9.38** |
| Psychoticism | 2.3 | 2 | 23.9 | 22 | 17.76*** |
| Obsessive-compulsive | 5.7 | 5 | 24.5 | 24 | 12.25*** |
| Depression | 6.2 | 5 | 23.7 | 22 | 9.89** |
| Hostility | 10.3 | 9 | 22.4 | 22 | 4.84* |
| Paranoia | 7.5 | 6 | 20.2 | 19 | 5.68* |
| Global Severity Index | 2.3 | 2 | 24.5 | 24 | 18.79*** |
| Positive Symptom Total | 10.5 | 9 | 24.0 | 23 | 5.70* |
| Positive Symptom Distress Index | 3.4 | 3 | 26.0 | 25 | 17.98*** |
| MC-2(10)/SDS (T-scores > 60) | 18.4 | 16 | 0 | 0 | 5.16*[a] |

Note: SD = Standard Deviation; U = Mann-Whitney's U test; d = Cohen's d.
* Significant differences at 0.05 level; ** Significant differences at 0.01 level; *** Significant differences at 0.001 level.
[a] Fisher's exact test.

## DISCUSSION

We proposed to verify if there was a difference in psychopathological symptoms between two groups of students when questioned by two different examiners, one of whom was a teacher (Group A), and the other of whom was closer to them in age and academic status (Group B).

Before that, we proposed to analyze the level of psychopathology and its socio-demographic correlates.

Generally, the level of distress is lower comparing to other investigations that used a comparable assessment methodology, but from different cultures (Cochran & Hale, 1985; Pereda, Forns, & Peró, 2007; Watson & Sinha, 1999). We cannot forget the importance of the culture differences, as Watson and Sinha (1999) have showed, but this apparent contrast may be better understood if we consider the role of the examiner.

Before that, lets analyze the psychopathological correlates. Significantly, women have a higher level of distress and more symptoms of somatization, anxiety, phobic anxiety, obsessive-compulsion, and depression. Sex differences in mental health were also evident in another studies involving students of different cultures (Bayram & Bilge, 2008; Hardy et al., 2012; Roberto & Almeida, 2011; Santos et al., 2009; Steptoe et al., 2007; Taylor et al., 2013; Verger et al., 2009; Zinn-Souza et al., 2008), but not in every culture (Guo et al., 2013; Nur et al., 2008). Could this be an indication of less supportive relationships among our young women, even though they are more likely to seek out and use social support (review of Taylor et al., 2013)?

The students that live at a higher distance from home have more anxiety and obsessive-compulsive symptoms. Probably, these students have less supportive relationships, which are especially important for mental health during demanding or transitional times (Nur et al., 2008; review of Taylor et al., 2013). Also, loneliness is more probable among these students, which is a source of considerable psychological distress (Zawadzki et al., 2013). In fact, we found that those students that are not engaged in an emotional relationship have more Phobic anxiety. One study that analyzed displacement from home found that only the combination of low income and living away from home was related with a higher risk of major depression disorder (Verger et al., 2009). But, other Portuguese investigation found the same trend of ours, showing that the displaced students had more depressive symptoms (Santos et al., 2009), which could be explained by the feeling of homesickness (Carden & Fiche, 1991; Ferraz & Pereira, 2002), and/or by the individualistic nature of our culture (Steptoe et al., 2007).

Surprisingly there was no association between course year (1st year/≥2nd year) with any BSI subscales, contrasting with several investigations showing that first-year college students report low levels of mental health (Cooke et al., 2006; Guo et al., 2013; Read et al., 2012; Santos et al., 2009; Silveira, 2012; review of Taylor et al., 2013), although we have found that those with less years of formal education have more phobic anxiety. The way Portuguese students live their first year of university, very likely, reflects a cultural aspect. Young people in Portugal work very hard for admission to the university, and some may relax once this is achieved, dividing their academic time with the very common engagement with social academic activities (like "group initiation ceremonies").

We also have found that there was no association between years of age with any BSI sub-scales, which is not consistent with some studies that revealed an association between age and ego-resilience, depression, and self-esteem (Hardy et al., 2012; Taylor et al., 2013), but is in line with results from other Portuguese study, from a Turkish, and Brazilian researches involving university students (Nur et al., 2008; Santos et al., 2009; Zinn-Souza et al., 2008). These disparate results might be due to different curricula, cultural differences, or sampling errors.

A high prevalence (54.5%) of students from social sciences have a high level of interpersonal sensitivity symptoms, and a relevant number of law and humanities students have a high level of obsessive-compulsive (35.3%) and hostility (38.2%) symptoms. Given the different sample sizes, this should be investigated in further studies.

When we look at the difference between researchers, we find higher scores in the sample collected by the younger examiner. These differences are significant in the Global Severity Index and in some BSI factors (phobic anxiety, psychoticism, and obsessive-compulsive). There were no significant differences between researchers in the values obtained in the MC-2(10) SDS. Notwithstanding these considerations, if the results reflect a contextual response, then BSI, despite of its instructions, is a potential measure of symptoms potentially induced by situational assessment factors and potentially diminished by social desirability.

The higher age of the group of the older examiner does not seem to be responsible for those differences. Besides, younger people are more prone to psychopathology (Hardy et al., 2012; Steptoe et al., 2007; Taylor et al., 2013), the very opposite of the older examiner findings.

Regarding the psychopathological symptoms (Global Severity Index), our Group B has a mean level of distress (M ± SD = 0.74 ± 0.50) similar to the mean found in Spanish students (Pereda et al., 2007), American female students (Cochran & Hale, 1985), Asian male students (Iwamasa & Kooreman, 1995), and Israeli students (Gilbar, 2002); but is higher than the mean found by Watson and Sinha (1999) in Canada and India. Group A Global Severity Index mean score (M ± SD = 0.53 ± 0.28) was lower than the means found in all the aforementioned studies. Taking in account these comparisons, the assessment made by the younger examiner seems more valid, but we do not know who was the examiner in the other investigations. Again, we cannot forget the role of social desirability in the differences between researchers in somatization, interpersonal sensitivity, anxiety, phobic anxiety, obsessive-compulsive, depression, hostility, and paranoid symptoms, except Global Severity Index, psychoticism, and Positive Symptom Distress Index. Probably, social desirability was put into action with the older examiner. But, if the results reflect a contextual response, then BSI, despite of its instructions, is a measure of symptoms potentially prompted by situational assessment factors and potentially decreased by social desirability.

Another possible explanation for the differences is that the younger examiner prompts the perceived relationship between symptomatology and academic pressure.

Additionally, can these results be explained by the authority of the examiner? In fact, according to Ardila (2005) the examiner must be seen as an authority figure; but certain personal characteristics such as gender, age, ethnicity, civil status, or proximity to the individual, may undermine this authority. In many societies social status is accorded to elders, so they are considered wiser and therefore more reliable than younger persons, who are seen as less capable. That said, in Western and other developed societies, the young are seen as having better scientific and technological knowledge (Ardila, 2005); thus the way the examinee perceives the examiner varies from culture to culture.

These hypothetical explanations disclose a hindrance of our study: if we have included a diagnostic interview performed by a third party, we could tell more accurately which one of the examiners obtained more reliable results? But then again, who should play the role of this third party?

Contributing to the uncertainty of these explanations, when we consider the prevalence, research shows us again that the prevalence of psychopathological symptoms is quite high in university students, and closer to the percentages found in Group B (Allgöwer et al., 2001; Kitzrow, 2003; Santos et al., 2009). But, if we compare with the only study conducted as a direct survey of a student sample (revision of Reifler, 2006), the percentage is closer to Group A. Because of these discrepancies, our results should be considered preliminary, demanding replication in larger, and homogeneous samples.

Our study has another limitations that should be noted. First, our sample was predominantly feminine, calling into question whether the results are as applicable to university males, in spite that sex differences are often minimized in university subjects (Nolen-Hoeksema, 1987). Nevertheless, future research should use homogeneous samples to control the potential moderator role of sex.

We did not control the socioeconomic background, life stress, and social support, which is another hindrance, since these variables have also been demonstrated to be related to mental health during transition to the university (Steptoe et al., 2007; review of Taylor et al., 2013; Verger at al., 2009). Further studies analyzing the correlates of students' mental health should take socioeconomic background into account.

Finally, since the present study was partially correlational and descriptive in nature, findings do not imply causal explanations among variables.

## CONCLUSIONS

Given the elevated risk of dropping out of university among students with poor mental health (Hartley, 2012), and the high rates of suicide in this population (Mackenzie et al., 2011; review of Mowbray et al., 2006; Zoroglu et al., 2003), this type of studies is important for targeting interventions. We have found potentially important factors for the variation of university students' mental health, and the importance of the circumstances of the assessment, indicating that at the very least the examiner's personal or socio-demographic characteristics should be given in this type of research. An additional conclusion concerns the instrument used for the assessment of mental health. Investigations using BSI must be cautious on interpreting its scores as a reflection of symptomatology of people experiencing psychiatric problems, and consider that disparate patterns in BSI scales could simply be methodological effects. For validation of results, a measure of social desirability should be part of assessment protocols with this population.

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