



Worry proneness, worry beliefs and personality – analysis of mutual relations and sex differences

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SUMMARY

Objectives. The aim of the study was to investigate the relationships between personality, worry-related beliefs and worry, taking sex differences into account.

Methods. Penn State Worry Questionnaire, Worry-Related Beliefs Questionnaire and NEO Personality Inventory-Revised. 115 university students (53 women and 62 men) were examined.

Results. Significant positive correlations between worry and neuroticism and its components were revealed, both in men and in women. Worry was also positively correlated with self-discipline in both men and women. Worry was negatively correlated with extraversion, gregariousness, assertiveness, values and competence in men, but not in women. Worry was negatively correlated with compliance in women, but not in men. Worry was also associated with worry-related beliefs, but these correlations were significant only in men.

Conclusions. Results of this study reveal several practical applications, especially for psychotherapy of problematic worry. Psychotherapy focused on modification of personality traits should be oriented to different traits in men and in women. Psychotherapy focused on modification of dysfunctional worry-related beliefs may be more effective in men than in women. Study limitations must be considered when interpreting findings of this study. Study sample was not representative of the population because it was selected from a specific group (university students). The correlational character of the study obstructs any interpretation of causal relationships among personality traits, worry and worry-related beliefs.

Key words: worry/beliefs about worry/personality traits

Worry is defined as a sequence of uncontrolled thoughts and images that evoke negative emotions, in result generating and sustaining elevated levels of anxiety [1]. Worrying conceptualized as an intrusive, negative mental habit – a cognitive component of anxiety, can be triggered by anxious thoughts or by environmental events. The process of worrying is oriented towards the future, in contrast to ruminations which are focused on the present situation or the past. Upon the initiation of worrying, concurrent uncontrollable intrusive cognitions emerge [2]. Worrying may hamper the individual's daily life functioning, affecting their mood and sustaining some fears. It can be also conceived as an attempt at controlling the situation and solving problems, or as an ineffective way of emotion-focused coping that induces anxiety [3]. Research into the problems of worry dates back to the early 1980s. This research

area was initiated in the US by Borkovec who noted in his studies on insomnia that psychogenic sleeplessness originates from intrusive cognitive activity when lying in bed [4].

Research conducted so far has indicated that people experience worry of various severity, that worry affects their behavior to different degrees, and is controllable to various extent. For example, one study reported that 38% of people experienced worry every day, while in 72% of respondents worrying occurred only once in the past month [5]. Most authors believe that worrying severity can be expressed as a continuum [6]. They recommend also differentiation between normal and pathological (excessive, unrealistic) worrying [7]. Many research findings suggest that women as compared to men are more prone to worry [8].

Among important traits of people with high levels of worry there is a tendency to experience distress and

anxiety [9, 10]. However, it is assumed that worrying can be experienced alone, disassociated from anxiety [11]. Worry was empirically linked to intolerance of uncertainty [12] and to pessimism – the latter may be regarded as a negative consequence of worrying [13, 14].

In research conducted so far, relationships between worry and worry-related beliefs have been also investigated. People who worry excessively were found to have positive beliefs about worry, i.e. to believe in beneficial consequences of this process [15]. Persons prone to chronic worry believe in benefits of worrying, i.e. that it may eventually thwart unfavorable events, and can better prepare them for the worst or for a highly stressful situation. Due to such beliefs worrying can be sustained later on [4].

In other studies a significant proportion of variance in adolescent worry was explained by intolerance of uncertainty, positive beliefs about worry and the so-called negative problem solving orientation [16]. Barahmand [17] reported that in his study beliefs about worry were related to worry among adolescents. A stronger relationship of worry severity with positive beliefs about worrying was noted in girls, while in boys – with negative problem solving orientation and intolerance of uncertainty. The author suggests that positive beliefs about worry and negative problem solving orientation may be pivotal in the process of adolescent depression and anxiety.

The size of the intolerance of uncertainty effect that explains variance in worrying may increase when interactions with metacognitive beliefs about worry and with beliefs about gaining control are included in the model. Some studies highlight a significant role of meta-cognitive beliefs and control beliefs (i.e. perceived control over events and reactions) in processes leading to the development of worrying [18]. Moreover, positive [15] as well as negative beliefs, and particularly the belief that worrying is uncontrolled and dangerous, were found to mediate the relationship between worrying severity and generalized anxiety disorder [19].

Only few studies investigated the relationship of worrying to personality traits. One study attempted to establish whether personality traits were related to or predicted modern health worries (i.e. concerns that one's personal health is threatened by modern life). Openness to experience and conscientiousness turned out to be significantly and positively correlated with such worries, but the links between modern health worries and neuroticism were surprisingly weak. In that study, modern health worries were found to be moderately correlated with personality traits [20]. In a study conducted among pregnant women, pregnan-

cy worries were significantly linked to neuroticism (a positive relationship) and agreeableness (negatively related to worries about the course of pregnancy) [21]. A positive relationship between neuroticism and worrying was reported by Gilbert [22].

Links between worry and personality were also observed in the studies confirming the hypothesis that worrying is to a considerable degree associated with introversion and feelings (according to Jung's typology) [23]. This is concordant with earlier research findings showing a correlation between neuroticism and worry [22], and links between neuroticism, introversion and feelings [23].

OBJECTIVES

The research findings cited above suggest that personality traits (particularly neuroticism) and worry-related beliefs may be linked to worry intensity [24, 22, 25]. The aim of this study was to investigate relationships of worry intensity to personality traits and beliefs about worry. In the rather few existing studies that explored the relationships between worry and personality no associations with beliefs about worry have been taken into consideration. An additional aim of the present study was to analyze possible gender differences in this respect. The following research questions were posed:

1. Is worry intensity linked to personality traits? If so, which personality traits are correlated with worry?
2. Do persons representing various levels of worry differ in their personality structure?
3. Are beliefs about worry related to worry intensity?
4. Are there any gender differences concerning relationships between personality traits and beliefs about worry on the one hand and worry intensity on the other?

PARTICIPANTS

Participants in the study were 115 students (53 women and 62 men) aged 19–27 (mean age 21.83 years, $SD = 1.93$) enrolled at the Lublin Polytechnic University or the College of Natural Sciences in Lublin. Due to single missing data in some questionnaires, the sample size for particular statistical analyses may be slightly different, which is noted in relevant tables. Participation in the study was anonymous and individual. The study was carried out between April and December 2010..

METHOD

Three instruments described below were used.

1. The Penn State Worry Questionnaire (PSWQ) in the Polish adaptation by Konrad Janowski [26]. The PSWQ consists of 16 items. The respondents indicate on a 5-point scale how typical of them is the behavior described by a given item. Possible scores range from 16 to 80, and higher scores denote higher intensities of worry. The instrument has very good psychometric properties and is most commonly used worldwide to assess the intensity of worry [27].

2. The Worry-Related Beliefs Questionnaire (WRBQ) was developed by Janowski, Basaj, Solarz, Załęska, Romanowska & Cudo [29]. An inspiration for the authors was the Meta-Cognitions Questionnaire (MCQ) [28], but the two instruments are different. The WRBQ consists of 25 items that describe various beliefs about worrying. The respondents indicate on a 4-point rating scale to what extent they agree with particular beliefs. Psychometric properties of the WRBQ were investigated in a sample of 171 respondents. Using factor analysis (principal component analysis with orthogonal rotation and Kaiser normalization) four factors were extracted explaining together 39% of variance in the WRBQ scores. There were too few items loading on Factor IV to form a separate subscale, and therefore they were eliminated. Moreover, items with too low loadings on other factors were excluded as well. Finally, the remaining items were used to create the following three subscales: (1) beliefs about gaining control through worrying; (2) negative beliefs about worry, and (3) positive beliefs about worry. The following internal consistency reliability coefficients (Cronbach's alpha) were obtained: 0.90 (subscale 1), 0.83 (subscale 2), and 0.76 (subscale 3).

3. The NEO Personality Inventory (NEO-PI-R) by Costa and McCrae in the Polish adaptation

by Siuta [30] was used for personality assessment. This paper-and-pencil inventory consists of 240 items that allow to evaluate five principal personality dimensions (traits): *neuroticism, extraversion, openness to experience, agreeability and conscientiousness*. Each of the dimensions is defined by 6 components. The instrument is based on the Costa and McCrae's Five Factor model of personality [31]. The NEO-PI-R reliability coefficients are rather high, the lowest Cronbach's alpha of 0.81 was obtained for the Agreeableness scale, while the coefficients for the remaining scales were almost identical (0.85 or 0.86) [30]. Normalization in the Polish population was conducted on a sample of 603 respondents, and the norms were computed separately for men and women in two age groups: 17–29 and 30–79 years [3]. In this study NEO-PI-R raw scores were converted into 'standard ten' scores using the norms included in the test manual.

Statistical analysis. Descriptive statistics, i.e. mean scores and standard deviations were calculated, and significance of gender differences was evaluated using unpaired Student's t-test. Pearson's *r* correlation coefficients were computed for the whole sample and for men and women separately. One way analysis of variance (ANOVA) and *post-hoc* tests were used to evaluate intergroup differences in the structure of personality traits of respondents with low, average or high levels of worry. Multiple comparisons were performed using Fisher's Least Significant Difference (LSD) test.

RESULTS

Table 1 presents mean scores and standard deviations for worry intensity and for beliefs about worry in the whole sample and in men and women separately,

Table 1. Descriptive statistics and the differences between men and women for the scores obtained on Penn State Worry Questionnaire (PSWQ) and Worry-Related Beliefs Questionnaire (WRBQ): in the entire group ($N = 108$ – total PSWQ score, $N = 111$ – Beliefs); in the group of women ($N = 51$ – total PSWQ score, $N = 50$ – Beliefs) and men ($N = 57$ – total PSWQ score, $N = 61$ – Beliefs)

| Variable | Whole sample | | Women | | Men | | t-test | |
|------------------------------|--------------|-------|-------|------|-------|-------|--------|-------|
| | M | SD | M | SD | M | SD | t | p = |
| Worry (PSWQ) | 44.78 | 11.42 | 47.22 | 9.83 | 42.60 | 12.37 | 2.13 | 0.035 |
| Worry-related beliefs (WRBQ) | | | | | | | | |
| – about gaining control | 22.10 | 5.67 | 20.96 | 4.03 | 23.03 | 6.61 | -2.03 | 0.045 |
| – positive | 14.51 | 2.85 | 14.94 | 2.44 | 14.16 | 3.13 | 1.47 | 0.145 |
| – negative | 26.83 | 4.42 | 26.72 | 4.34 | 26.92 | 4.53 | -0.23 | 0.816 |

Note. Sample size: PSWQ – whole sample $N = 108$ (57 men, 51 women); WRBQ – whole group $N = 111$ (61 men, 50 women)

while unpaired t-test values show the significance of gender differences in worry and beliefs about worry. Significant gender differences were found in worry intensity (PSWQ global scores) – women turned out to be significantly more prone to worrying. Another gender difference pertained to beliefs about gaining control through worrying – men scored significantly higher on this scale.

Table 2 presents coefficients of correlation between worry and personality traits. Out of the five main personality dimensions only one, i.e. *neuroticism*, was found to significantly correlate with worry. Moderate positive correlations were found both in men and women ($r = 0.66$ and 0.70 , respectively). The only other personality dimension that significantly correlated with worry was *extraversion* – the correlation was negative, much weaker as compared to that of *neuroticism* ($r = -0.27$), and observed in men only.

Significant correlations of worry were found also with components of particular personality dimensions. All components of *neuroticism* correlated positively with worry intensity. These associations were very similar in men and women, except for *impulsiveness* that significantly correlated with worry in women only. As regards *extraversion*, the only significant relationship was the negative correlation with *assertiveness* observed only in men. Among components of *openness to experience* only that of *values* turned out to be significantly linked to worry intensity (a negative correlation), and was observed only in men. A significant negative correlation of worry was found with a single component of *agreeableness*, i.e. with *compliance*, but only in women. Three components of *conscientiousness* were significantly negatively correlated with worry, namely: *competence* (in men only), *dutifulness* (both in men and women), and *self-discipline* (the latter correlation achieved the level of statistical significance only in the entire sample).

Table 3 presents coefficients of correlation between the intensity of worry and beliefs about worry. Among men, significant correlations were found between worry intensity and all the three categories of beliefs about worry: positive (in the case of positive beliefs and beliefs about gaining control through worry) and, and negative – with negative worry-related beliefs. No significant relationships of worry to worry-related beliefs were found in women. The significant correlations between these variables observed in the whole sample have to be attributed to the effect of their occurrence only in men.

Table 2. Pearson's r correlation coefficients between the levels of worry (PSWQ total score) and the dimensions of the NEO-PI-R Inventory in the whole group ($N = 108$); in the group of women ($N = 51$) and men ($N = 57$)

| Dimensions/components of personality traits | Entire sample ($N = 108$) | | Women ($N = 51$) | | Men ($N = 57$) | |
|---|-----------------------------|-------|--------------------|-------|------------------|-------|
| | r | p | r | p | r | p |
| N Neuroticism | 0.66 | 0.001 | 0.70 | 0.001 | 0.66 | 0.001 |
| E Extraversion | -0.18 | 0.067 | -0.07 | 0.617 | -0.27 | 0.040 |
| O Openness to Experience | -0.06 | 0.549 | 0.03 | 0.841 | -0.07 | 0.601 |
| A Agreeableness | 0.04 | 0.682 | -0.17 | 0.247 | 0.15 | 0.264 |
| C Conscientiousness | -0.14 | 0.137 | -0.18 | 0.212 | -0.18 | 0.176 |
| N1 Anxiety | 0.68 | 0.001 | 0.71 | 0.001 | 0.68 | 0.001 |
| N2 Aggressive Hostility | 0.30 | 0.001 | 0.30 | 0.030 | 0.34 | 0.010 |
| N3 Depression | 0.58 | 0.001 | 0.64 | 0.001 | 0.56 | 0.001 |
| N4 Self-Consciousness | 0.54 | 0.001 | 0.47 | 0.001 | 0.57 | 0.001 |
| N5 Impulsiveness | 0.17 | 0.075 | 0.31 | 0.028 | 0.12 | 0.392 |
| N6 Vulnerability | 0.43 | 0.001 | 0.38 | 0.007 | 0.50 | 0.001 |
| E1 Warmth | -0.01 | 0.937 | 0.10 | 0.488 | -0.11 | 0.408 |
| E2 Gregariousness | -0.15 | 0.122 | 0.01 | 0.957 | -0.29 | 0.028 |
| E3 Assertiveness | -0.27 | 0.004 | 0.02 | 0.905 | -0.41 | 0.001 |
| E4 Activity | -0.11 | 0.265 | -0.10 | 0.469 | -0.13 | 0.345 |
| E5 Excitement Seeking | -0.08 | 0.406 | -0.05 | 0.732 | -0.22 | 0.105 |
| E6 Positive Emotions | -0.11 | 0.245 | -0.20 | 0.156 | -0.05 | 0.701 |
| O1 Fantasy | 0.00 | 0.967 | 0.21 | 0.136 | -0.10 | 0.441 |
| O2 Aesthetics | 0.08 | 0.409 | 0.04 | 0.781 | 0.15 | 0.274 |
| O3 Feelings | 0.07 | 0.446 | -0.05 | 0.711 | 0.10 | 0.460 |
| O4 Actions | -0.02 | 0.835 | -0.08 | 0.597 | 0.02 | 0.892 |
| O5 Ideas | -0.10 | 0.287 | -0.03 | 0.862 | -0.12 | 0.368 |
| O6 Values | -0.23 | 0.017 | -0.03 | 0.833 | -0.35 | 0.009 |
| A1 Trust | 0.06 | 0.575 | 0.02 | 0.904 | 0.07 | 0.621 |
| A2 Straightforwardness | 0.03 | 0.727 | -0.15 | 0.301 | 0.15 | 0.278 |
| A3 Altruism | -0.10 | 0.290 | -0.27 | 0.055 | -0.04 | 0.773 |
| A4 Compliance | -0.12 | 0.221 | -0.40 | 0.003 | 0.04 | 0.753 |
| A5 Modesty | 0.18 | 0.069 | 0.02 | 0.907 | 0.25 | 0.061 |
| A6 Tender-Mindedness | 0.15 | 0.123 | 0.00 | 0.999 | 0.15 | 0.278 |
| C1 Competence | -0.26 | 0.010 | -0.21 | 0.149 | -0.34 | 0.010 |
| C2 Order | -0.17 | 0.077 | -0.18 | 0.200 | -0.17 | 0.215 |
| C3 Dutifulness | -0.19 | 0.047 | -0.24 | 0.086 | -0.17 | 0.197 |
| C4 Achievement Striving | 0.11 | 0.258 | 0.16 | 0.273 | 0.04 | 0.756 |
| C5 Self-Discipline | -0.34 | 0.001 | -0.39 | 0.005 | -0.35 | 0.008 |
| C6 Deliberation | 0.13 | 0.175 | -0.05 | 0.752 | 0.19 | 0.149 |

Table 3. Table 3. Pearson's *r* correlation coefficients between the levels of worry (PSWQ total score) and the worry-related beliefs in the whole group (N = 105); in the group of women (N = 49) and men (N = 56)

| Variables | Whole sample (N = 105) | | Women (N = 49) | | Men (N = 56) | |
|--|------------------------|----------|----------------|----------|--------------|----------|
| | <i>r</i> | <i>p</i> | <i>r</i> | <i>p</i> | <i>r</i> | <i>p</i> |
| Beliefs about gaining control through worrying | 0.29 | 0.003 | 0.14 | 0.353 | 0.45 | 0.001 |
| Positive beliefs about worrying | 0.35 | 0.001 | -0.03 | 0.86 | 0.53 | 0.001 |
| Negative beliefs about worrying | -0.13 | 0.176 | 0.11 | 0.46 | -0.30 | 0.026 |

Note: Statistically significant correlations are bolded.

In order to establish whether worry intensity significantly differentiated personality structure, the participants were divided into three subgroups representing different levels of worry (low, average or high). The criterion used to divide the sample was based on the distribution of the PSWQ scores: group 1 (low) with scores below the first quartile, group 2 (average) – between the first and third quartiles, and group 3 (high) scoring above the third quartile.

Table 4 presents PSWQ mean scores, standard deviations and results of one-way ANOVA testing intergroup differences between these means. As regards main personality dimensions, significant intergroup differences can be seen for *neuroticism* and *openness to experience*. The compared groups differed also in terms of particular components of these two (and some other) dimensions. All components of *neuroticism*, except for *aggressive hostility*, turned out to differentiate the three groups. The other differentiating personality components included *assertiveness*, *values*, *competence*, and *self-discipline*.

Detailed data are shown in Table 4 and in Figures 2 and 3.

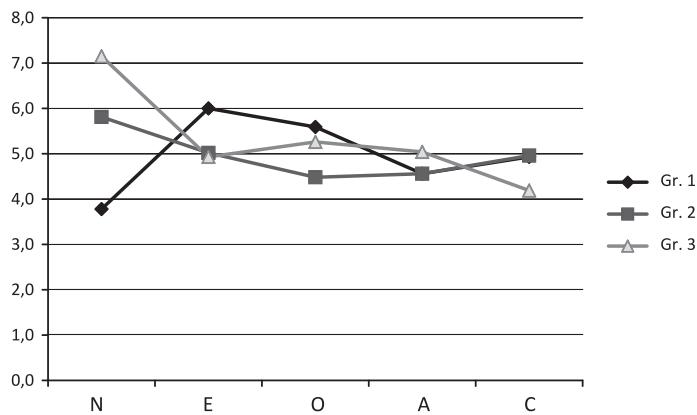


Figure 1. The structure of personality traits in groups with low, medium and high propensity to worry

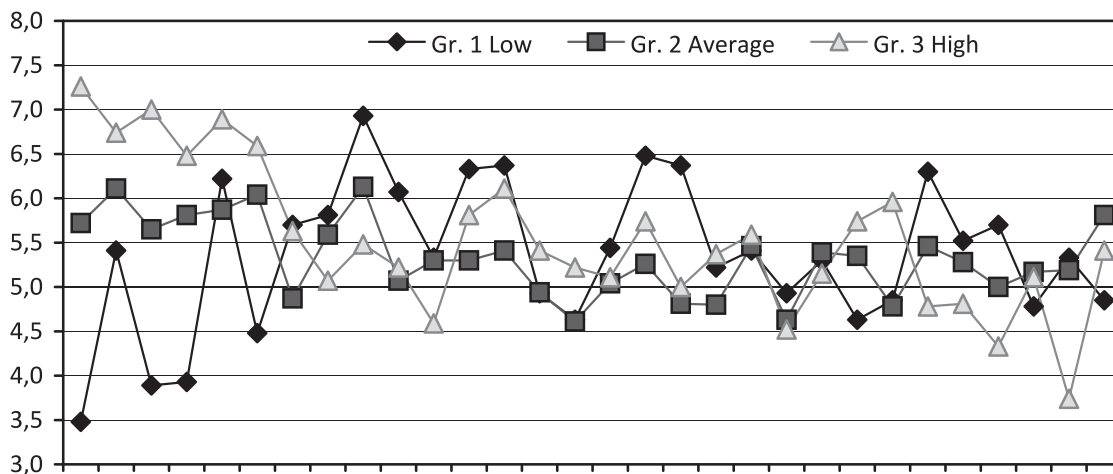


Figure 2. The structure of personality traits in groups with low, average and high levels of worry

Table 4. Results of the univariate analysis of variance and differences between the groups

| Variable | Groups with different levels of worry | | | | | | Analysis of variance (ANOVA) | | Significant differences between groups |
|---|---------------------------------------|------|------------------|------|---------------|------|------------------------------|------|--|
| | Low (N = 27) | | Average (N = 54) | | High (N = 27) | | F | p≤ | |
| | M | SD | M | SD | M | SD | | | |
| The criterion variable – worry level (PSWQ global scores) | 30.22 | 5.47 | 45.06 | 4.66 | 58.78 | 6.27 | 196.05 | .001 | 1–2, 1–3, 2–3 |
| N Neuroticism | 3.78 | 1.99 | 5.81 | 1.36 | 7.15 | 1.70 | 29.78 | .001 | 1–2, 1–3, 2–3 |
| E Extraversion | 6.00 | 2.15 | 5.02 | 1.71 | 4.93 | 1.96 | 2.93 | .058 | none |
| O Openness to Experience | 5.59 | 2.19 | 4.48 | 1.68 | 5.26 | 2.05 | 3.51 | .034 | 1–2 |
| A Agreeableness | 4.56 | 1.83 | 4.56 | 2.23 | 5.04 | 1.76 | 0.57 | .566 | none |
| C Conscientiousness | 4.93 | 2.04 | 4.96 | 1.89 | 4.19 | 1.66 | 1.69 | .190 | none |
| N1 Anxiety | 3.48 | 1.83 | 5.72 | 1.20 | 7.26 | 1.72 | 42.74 | .001 | 1–2, 1–3, 2–3 |
| N2 Aggressive Hostility | 5.41 | 2.42 | 6.11 | 1.93 | 6.74 | 1.97 | 2.80 | .065 | none |
| N3 Depression | 3.89 | 1.95 | 5.65 | 1.49 | 7.00 | 1.92 | 22.11 | .001 | 1–2, 1–3, 2–3 |
| N4 Self-Consciousness | 3.93 | 1.88 | 5.81 | 1.42 | 6.48 | 2.31 | 15.32 | .001 | 1–2, 1–3 |
| N5 Impulsiveness | 6.22 | 1.58 | 5.87 | 1.63 | 6.89 | 1.95 | 3.23 | .043 | 2–3 |
| N6 Vulnerability | 4.48 | 1.72 | 6.04 | 1.76 | 6.59 | 1.80 | 10.80 | .001 | 1–2, 1–3 |
| E1 Warmth | 5.70 | 2.40 | 4.87 | 2.04 | 5.63 | 2.15 | 1.84 | .164 | none |
| E2 Gregariousness | 5.81 | 2.00 | 5.59 | 1.74 | 5.07 | 1.80 | 1.20 | .304 | none |
| E3 Assertiveness | 6.93 | 2.09 | 6.13 | 1.68 | 5.48 | 2.28 | 3.73 | .027 | 1–3 |
| E4 Activity | 6.07 | 2.46 | 5.07 | 1.90 | 5.22 | 2.26 | 2.04 | .136 | none |
| E5 Excitement Seeking | 5.33 | 1.82 | 5.30 | 1.95 | 4.59 | 1.91 | 1.43 | .244 | none |
| E6 Positive Emotions | 6.33 | 2.29 | 5.30 | 2.04 | 5.81 | 1.94 | 2.30 | .105 | none |
| O1 Fantasy | 6.37 | 1.80 | 5.41 | 1.89 | 6.11 | 1.87 | 2.84 | .063 | none |
| O2 Aesthetics | 4.93 | 2.73 | 4.94 | 1.80 | 5.41 | 2.08 | 0.49 | .613 | none |
| O3 Feelings | 4.63 | 1.92 | 4.61 | 1.95 | 5.22 | 2.03 | .96 | .385 | none |
| O4 Actions | 5.44 | 2.44 | 5.04 | 1.82 | 5.11 | 2.03 | .37 | .693 | none |
| O5 Ideas | 6.48 | 2.03 | 5.26 | 2.21 | 5.74 | 2.25 | 2.86 | .062 | none |
| O6 Values | 6.37 | 1.88 | 4.81 | 2.07 | 5.00 | 2.30 | 5.27 | .007 | 1–2, 1–3 |
| A1 Trust | 5.22 | 2.03 | 4.80 | 2.16 | 5.37 | 2.08 | .79 | .455 | none |
| A2 Straightforwardness | 5.41 | 2.08 | 5.46 | 1.95 | 5.59 | 1.85 | .07 | .937 | none |
| A3 Altruism | 4.93 | 2.22 | 4.63 | 2.09 | 4.52 | 2.05 | .28 | .759 | none |
| A4 Compliance | 5.30 | 1.49 | 5.39 | 1.82 | 5.15 | 1.73 | .18 | .838 | none |
| A5 Modesty | 4.63 | 1.78 | 5.35 | 2.12 | 5.74 | 1.65 | 2.33 | .102 | none |
| A6 Tender-Mindedness | 4.85 | 2.16 | 4.78 | 2.02 | 5.96 | 1.72 | 3.47 | .035 | none |
| C1 Competence | 6.30 | 2.23 | 5.46 | 2.13 | 4.78 | 2.22 | 3.30 | .041 | 1–3 |
| C2 Order | 5.52 | 2.14 | 5.28 | 1.71 | 4.81 | 1.71 | 1.05 | .352 | none |
| C3 Dutifulness | 5.70 | 2.20 | 5.00 | 2.02 | 4.33 | 1.94 | 3.03 | .053 | none |
| C4 Achievement Striving | 4.78 | 2.33 | 5.17 | 2.14 | 5.11 | 1.99 | .31 | .737 | none |
| C5 Self-Discipline | 5.33 | 2.11 | 5.19 | 1.87 | 3.74 | 1.81 | 6.18 | .003 | 1–3, 2–3 |
| C6 Deliberation | 4.85 | 1.81 | 5.81 | 1.78 | 5.41 | 1.62 | 2.75 | .069 | none |

DISCUSSION

The literature on worry cited in the preceding paragraphs indicates the presence of associations between personality traits and worry [20]. It should be noted that neuroticism has been repeatedly reported [20, 33, 21] as the trait related to worry. Other dimensions, such as introversion [23, 33], agreeableness [21], openness to experience and conscientiousness [34] are indicated in this context as well. Some studies suggested statistically significant, but weak relationships of worry intensity to neuroticism as a trait [20]. Our research findings reported in this paper corroborate the hypothesis about association between some main personality dimensions and worry. Moreover, in the present study worry was found to be associated also with several components of these dimensions. Worry was significantly correlated only with neuroticism and extraversion, however, in contrast to the data from the literature – not with conscientiousness [34]. The strong association between worry and anxiety as a component of neuroticism (the strongest relationship among all the significant correlations found in our study) was reported also in the literature [35]). Our findings show that the association between worry and neuroticism and its various components is significant and – as compared with other personality dimensions – definitely the strongest.

The hypothesis about relationships between worry-related beliefs and worry was also tested in our study. In research conducted so far, positive and negative beliefs about worry have been found to be significantly related (most probably indirectly) to various aspects of human functioning. For example, significant positive correlations of such beliefs with smoking dependence [36] show their functional importance. Our findings indicate that each of the three categories of beliefs analyzed in the study was significantly correlated with worry, but only in men, while none of the corresponding correlation coefficients turned out to be significant in women. However, an association between positive beliefs about worry and worry intensity in adolescent girls was reported in the literature [17]. Other studies indicate that both positive and negative beliefs about worry may contribute to the onset of pathological worrying (a very strong mental habit hampering the individual's functioning), but no gender differences in this respect were reported [37].

To explore the patterns of personality traits among people differing in worry intensity, the sample was divided into three subgroups. Intergroup comparisons using one-way ANOVA, similarly as the correlation-

al analysis, revealed the most significant differences regarding neuroticism and its components, while the differences in openness and in several components of the remaining personality dimensions were less pronounced. The results suggest that high levels of neuroticism are a strong risk factor of worry, while high levels of openness to experience may be a protective factor, though relatively weaker.

A cognitively valuable result of this study seems to be the finding that some personality traits are correlated with worry intensity only in men, or only in women. Namely, impulsivity and compliance were associated, respectively, with higher and lower levels of worry only in women, while assertiveness, values and competence – with lower levels of worry only in men. Thus, besides neuroticism (the most important personality dimension linked to worry proneness irrespective of gender), the personality background of worry is different in men than that in women. Nevertheless, it should be noted that the personality traits other than neuroticism showed definitely weaker correlations with worry intensity, thus their role in determining worry processes is likely to be less important.

Our research findings may have some practical implications, particularly for psychotherapy and counseling for people with problematic worry. If undertaken, the therapeutic interventions aimed at personality change should be targeted at somewhat different personality traits in women than in men. On the other hand, if therapeutic interventions are focused on modification of beliefs about worry, positive results can be expected in men, while such interventions may be ineffective in reducing worry in women.

For an appropriate interpretation of the findings, limitations of this study should be considered. Caution should be exercised as regards generalization of the findings, since the sample under study was not representative of the entire population, being selected from a specific social group (of university students). Due to the correlational character of the study no univocal conclusions about causative relationships between the intensity of worry and personality traits or worry-related beliefs can be drawn.

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