



## Letter to the Editor

### Levels and subtypes of depression should not be overlooked in research on neuroticism and cortisol<sup>☆</sup>



DeSoto and Salinas (in press) examined the relationship between neuroticism and the activity of the hypothalamic–pituitary–adrenal (HPA) axis. The authors observed a positive correlation between neuroticism and the level of cortisol in men ( $r = .29$ ;  $n = 47$ ) and a negative correlation between neuroticism and the level of cortisol in women ( $r = -.18$ ;  $n = 109$ ). On this basis, the authors concluded that personality affects the activity of the HPA axis in a sex-specific manner. In our view, the internal validity of the authors' study is threatened by the absence of assessment and statistical control of depression.

Neuroticism and depression are positively and strongly correlated variables (e.g., Jylha and Isometsa, 2006). This suggests that depression is a key potential confounder in neuroticism research, requiring systematic consideration. In addition, depression is known to be associated with alterations of the HPA axis, in a subtype-dependent way. Thus, melancholic depression has been related to *hypercortisolism* whereas atypical depression has been related to *hypocortisolism* (Gold and Chrousos, 2002; Hellhammer and Hellhammer, 2008). Interestingly, because melancholic depression has been found to be more prevalent in men and atypical depression in women (Blanco et al., 2012; Hildebrandt et al., 2003; Schuch et al., 2014), this state of affairs is directly relevant to the sex-focused questioning of the authors. Depression may actually account for the differences in cortisol levels imputed to neuroticism.

Controlling for depression would have been all the more important that the associations between neuroticism and cortisol levels are relatively weak in the authors' study, with neuroticism explaining about 3% of the variance in women's cortisol level, and about 8% in men's. The inclusion of depression in the tested models might have rendered the reported associations between neuroticism and cortisol level statistically nonsignificant, leading the authors to draw different conclusions.

Because of the noncontrol of key confounding variables, inconclusive studies are accumulating in neuroticism research. The correction of this trend should be high on the agenda of neuroticism researchers.

## References

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