Dear Assistant Editor

Please find enclosed our revised manuscript (ID - 1998834630151140) and our response point by point to the comments given by the two reviewers. We want to thank both referees for their valuable comments and constructive criticism.

Reviewer: Ana Adan
1. We have rewritten this part of the Abstract (page 2, line 6) to match the information given in the Methods (page 4, line 25 and page 5, line 1) in order to clarify the definite twins studied.
2. We have corrected the location for the complete denomination of the FTCQ in the Methods (page 6, lines 6 to 7).
3. The data have been collected from Finland, a country residing at rather northern latitudes, which can limit the generalization of our results as far as the globe is concerned. We have given this information in the Abstract (page 2, lines 20 to 21) and the Discussion (page 13, lines 10 to 12).
4. For studying the stability of circadian preference, the data have been derived from the FTCQ. We have given this information in the Methods (page 6, lines 6 to 8) and the Results (page 10, lines 11 to 12) as well as in Figure 1.
5. Recently, two studies have reported sex differences in morningness-eveningness preference (1, 2). In our study, there was no sex difference in circadian preference, probably due to the small sample size. We have added this information in the Discussion (page 12, lines 3 to 4).

Reviewer: Francesco Benedetti
1. We have presented more raw data throughout the Results (pages 7 to 10).
2. We have revised the language.
3. This variable (light exposure) was formulated as the sum of two items of the SPAQ (item 14 D for sunny days plus item 14 G for long days), ranging from -6 to +6 points.
4. We had the power of 60% to detect differences of 15% or greater in the distribution of admissions by season among our sample. With a sample size of 15 to 20 additional cases, the power would have been 80%. However, it was not possible for us to increase the sample size, and therefore the evidence remains limited.
5. These changes in circadian type preference and the increasing need of sleep might reflect the diversity of mechanisms of action, being specific to bipolar disorder and different from those of major depressive disorder. It is known that individuals with insomnia are more likely to have a major depressive episode, and longitudinal studies have also shown that the persistence of insomnia is associated with the appearance of a new depressive episode (3). We have rewritten this part of the Discussion (page 12, lines 10 to 20).
6. We have presented more raw data for all observations, as requested (pages 7 to 10).
7. These variables (dry days and sunny days) are separate items 14D and 14 E of the SPAQ and were analysed as such.
8. We have given more raw data in Table 4.
9. Concerning the medication status, 28 % (n=19) of the subjects used neuroleptics, 11 % (n=7) antidepressants, 22 % (n=15) lithium, 8% (n=5) antiepileptics, and 5 % (n=3) thyroxine. The reports of sleep duration were derived from the SPAQ. This item is assessed with the SPAQ as the usual length of sleep the individual tends to have, so we think that the medication status is unlikely to affect this retrospective, long-term self-report.
10. Our results show that the season-bound symptoms of dizygotic twins were more correlated than those of monozygotic twins, giving evidence against a major genetic effect. The intrapair correlation of the GSS was 0.16 for the monozygotic twin pairs, and 0.21 for the dizygotic twin pairs (page 9, lines 20 to 22).
11. Patients with sleep debt had 47 admissions, and those without sleep debt had 43. There were no difference in the number of hospital admissions between the two groups.
12. The dual vulnerability hypothesis claims that affective disorder with the seasonal pattern consists of a seasonal factor and a depression factor. Subjects with a stronger seasonal factor primarily have vegetative symptoms (e.g. hypersomnia), without marked cognitive symptoms. At the opposite end of the trait, subjects with a stronger depression factor tend to have cognitive symptoms (e.g. insomnia), without marked vegetative symptoms (4, 5). We have added this information in the Discussion (page 12, lines 12 to 17).
13. One of our aims was to study the effect of natural light on bipolar disorder. We expected that the history of more exposure to natural light would have positive effects on wellbeing in twins with bipolar disorder. We have added this information in the Study aims (page 4, lines 13 to 15).

References:

We hope that the revisions made have improved the manuscript enough to be still considered for publication in the Journal.

Sincerely, on behalf of our research group

Reeta Hakkarainen, M.B.