Reviewer's report

Title: Heritable patterns of tooth decay in the permanent dentition: Principal components and factor analyses

Version: 1  Date: 21 September 2011

Reviewer: Paula Trevilatto

Reviewer's report:

Dear authors,

This is a very concise and well-written article, which provides fruitful concerning about the definition of decay phenotypes, once patterns of decay may be determined by different risk factors, with genetic and non-genetic etiology. The definition of well characterized phenotypes is an extremely relevant initiative especially in the context of genetics, whose background may underlie susceptibility to diseases.

DMFT/DMFS are among the most used oral health indexes intended to measure caries phenotypes, but that may capture information not only about caries but also on other oral conditions such as periodontitis, trauma, and even overtreatment, generating a complex phenotype highly prone to cryptic confounding effects, and therefore very difficult to interpret. Therefore, the use of patterns as novel decay phenotypes might help understand the multifactorial nature of dental caries and identify risk factors specifically associated to each pattern.

In general terms, the manuscript is well-designed and counts on an apparently reasonable number of individuals. The statistical analyses are appropriate and make use of adequate softwares and tools. In this context, I only have a few questions to help me understand some aspects of the design and results.

1) The criterion: missing due to decay was used to select affected phenotypes. Can the modeling overcome some kind of caries assessment error?

2) Do you predict some kind of modeling which could investigate activity more than disease experience?

3) Why do you think are the main reasons for the relatively different patterns explained by the 2 models used in the study?

4) Could some extrapolation be made in relation to the higher heritability for FAC3 and FAC6 in terms of thinking some decay patterns such as smooth surfaces could be more related to genetic risk factors?

5) Do you think it could be another limitation of the study the assessment of mesial and distal surfaces by means of clinical inspection? Couldn’t such affected sites be underestimated in relation to other sites less difficult to visual inspection? Could this discrepancy interfere with the results of the 2 analytic methodologies?
6) From 2,663 individuals included in the study, would you please clarify the exact reasons why the final sample number was of 1,071 subjects?


8) Some minor comments are: in the Statistical analysis, 5th paragraph, correct (using by) the Pearson… In figure 2 isn’t it FAC 1 instead of PC2? In the Supplementary materials (Fig. S2), aren’t FAC3 and FAC4 instead of PC3 and PC4?

Best regards
Paula Cristina Trevilatto

Level of interest: An article of outstanding merit and interest in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

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