Review 1

Dear Dr. Kräplin,

Thank you for submitting your revised Stage 1 Registered Report, entitled "Impulsivity and online sports betting behavior: Untangling the causal relationship" to PCI RR. All previous comments have been addressed very satisfactorily. Both the procedure and data analysis plans are much clearer now. However, there are some final issues that still need to be further clarified:

Dear Dr. Zhang Chen,

We would like to thank you once again for your time and your helpful comments. We are very grateful to have received such good feedback. Our manuscript has been improved by implementing your feedback and we are pleased to resubmit it for further review. Please note that in the submitted manuscript with 'track changes' we have accepted all changes from the first round of reviews and have only made current changes in track changes mode. In our response letter, we refer to the lines of the manuscript in track changes mode (not those in the final manuscript on the ZPID server). In addition to the requested changes, we have also updated the current sample size for wave 2 (line 214 ff.), updated a book chapter to the current version (Hayes 2017 to Hayes 2022), and fixed minor typos.

The methods for determining the number of factors in risky betting behavior are now made concrete (starting from line 411 in the revised manuscript). However, in the Hypothesis testing section, starting from line 554: "If the eigenvalue of the first factor is significantly larger than those of the remaining factors, we will extract a single factor, resulting in a single risky gambling behavior score per participant. If inspection of the eigenvalues indicates several factors, we will run five separate models (5 predictors) for each of the factors." This method of determining the number of factors seems inconsistent from the section above (line 411). Please clarify this point.

You are right, there was an inconsistency in the description of the factor selection for risky betting behavior in the two different sections. Thanks to your feedback, we have corrected the inconsistency in the Hypothesis section by referring to the complete factor selection procedure in the Operationalization section (lines 466 - 468):

"The method for factor extraction is described in the section 'operationalization and study materials: (3) Risky betting behavior'."

I am afraid the statistical inference process for Hypothesis 2 is not entirely clear to me. If the factor analysis reveals multiple factors for risky betting behavior, say 3, I assume 15 models will be run in total for Hypothesis 2. Will a sub-hypothesis be considered to be supported if it correlates with at least one of the 3 factors on risky betting behavior? If that is the case, the test for a sub-hypothesis seems to become less stringent as the number of factors for risky

betting behavior increases. I am wondering if you have considered alternatives, for instance, by requiring a predictor to be associated with at least N-1 factors (in case N > 1) of risky betting behavior, in order to say a certain sub-hypothesis is supported. I guess this will also be consistent with how you deal with the three facets of impulsive personality at the moment, by requiring at least two of them to correlate with outcomes of interest.

We thank you for pointing out the inconsistency in the handling of the statistical inference procedure for Hypothesis 2. We have adopted your suggestion and are now specifying the procedure for determining the requirements for supporting or rejecting all the hypotheses. We have also decided to set the upper limit for the number of factors for 'risky gambling behavior' at three, in order to avoid calculating an excessive number of models and because more factors will not be meaningful for interpretation (lines 472 – 477):

"We set the upper limit for the number of factors for risky gambling behavior at three in order to have a reasonable number of factors for our modelling. Depending on the result of the factor analysis, the sub-hypotheses for risky gambling behavior will be considered supported if impulsivity correlates with at least one (factor solution with one or two factors) or two (factor solution with three factors) factors of risky betting behavior."

For Hypothesis 3, I wonder whether all models will be run, or only a subset of them will be examined depending on the results of Hypothesis 1 and 2. For instance, will the potential mediation effect of a certain factor of risky betting behavior still be examined, if the analysis in Hypothesis 2 revealed that it was not predicted by impulsivity?

This is a very good question that we need to answer in the paper. According to Hayes (2022) we assume that in mediation analyses it does not matter whether a (aka Hypothesis 1) or b (aka Hypothesis 2) are significant or not, an indirect effect must be tested independently: "Because ab is the proper estimate of the indirect effect, inference should be based on ab, not on individual hypothesis tests of Ta and Tb (p. 122)." We have now clarified this assumption in lines 503 - 506 of the revised manuscript:

"We will treat this hypothesis test as independent from the results of Hypotheses 1 and 2. Per Hayes (2022; p. 122), our inference about the indirect effect (ab) will be based on the bootstrap results for the indirect effect itself, rather than the results for the constituent paths (a and b)."

As part of this revision, we have revised one sentence on hypothesis 3 in the Design section to increase clarity (line 146 - 148).

Minor point: line 53: "an increase of 15,6%". You may want to use "15.6" to be consistent with the rest of the manuscript.

It has been corrected.