Response to Reviewer

Dear Prof. Moustaki,

Thank you for your thoughtful feedback on our manuscript titled “Disentangling Groupwise Heterogeneity in the Mediating Relationships of Yearly Renewable Education Programs”, submitted for publication as part of the IMPS 2024 Proceedings. We found your comments very helpful in revising and refining our manuscript. Please find below the three main changes of our revision in response to each of your comments.

First, we supplemented our decision to investigate children’s home language environment as the grouping factor for groupwise causal mediation analysis in sections 1 and 4.1. We’ve cited multiple child development literature on how dual language learners and English-monolingual children go through different early childhood experiences, providing contextual information that children’s home language environment may be a representative as a feature of mediation effect heterogeneity. We believe our illustration will serve as an example to readers wondering how one should decide the group factors before investigating groupwise heterogeneity in causal mediation effects.

Second, we provided the regression coefficient estimates of the mediator and outcome models as Tables 2 and 3 to show how ignoring vs. acknowledging groupwise heterogeneity could affect the regression coefficient estimates that become important elements of the NDE and NIE estimates. This is followed by a detailed discussion in section 4.2 where it is pointed out that the regression coefficients neglecting groupwise heterogeneity are likely not arithmetic means of groupwise regression coefficients and thus deviate from theoretically relevant (e.g., group-average) regression coefficients and mediation effect estimates.

Finally, we complemented our discussion for future research directions in section 5 by citing recent works in causal mediation methods for heterogeneous populations that augment mixture modeling to detect latent subgroups that may exhibit greater variability in NDE and NIE.

Thank you again for your helpful feedback. We would be happy to pursue further modifications to improve the significance and clarity of our manuscript if needed.

Sincerely,

Hanna Kim & Jee-Seon Kim