

Dear Dr. Mackay,

Thank you for forwarding us your comments and the reviewers' comments on our manuscript. We were pleased to have an opportunity to revise our manuscript entitled "Variation in use of East Asian Late Paleolithic weapons: A study of tip cross-sectional area of stemmed points from Korea" and we extend our gratitude to the reviewers for their insightful comments. In our effort to enhance the quality of the manuscript, we have thoughtfully addressed the reviewers' suggestions.

Below, we explain the changes we have made in response to the reviewers' comments. We reply to each comment in point-by-point fashion. The concerns raised by reviewers and our responses are color coded as follows: a) Comments from the reviewers are shown in blue; b) Our responses are shown in red.

We also noticed that the line numbers that the editor mentioned in their comments are slightly different from the original Word document, assuming that the journal deleted writers' information.

Editor: At this stage, please also ensure that you have replaced your initial-submission image files with production quality figures. These should be supplied at 300 dpi resolution for .jpeg and .tiff or as .eps files. Figures should not include Figure number labels in the image.

Response: We converted all figures to jpeg files with a resolution of 300 dpi.

Reviewer 1:

1. In the Introduction clearly state the period in which the stemmed points analyzed in the study date to.

Response: We have added study date (approx. 40~12 ka) in abstract as well as introduction.

2. In the abstract, Intro, and Conclusion the phrase "the best-fit ballistic probabilities for the stemmed points" is used, this is clunky and could be clarified.

Response: This term, "the best-fit ballistic probabilities (probability)", has been used in other TCSA papers led by our co-author Prof Marlize Lombard, so we decided to keep this term for consistency across the literature (e.g. Lombard, M., Lotter, M. G., & Caruana, M. V. (2022). The tip cross-sectional area (TCSA) method strengthened and constrained with ethno-historical material from sub-Saharan Africa. *Journal of Archaeological Method and Theory*, 1-25.).

3. Not critical to the study at hand, but, in describing the migration model (lines 95-98) it is unclear what exactly is going on; is this the migration of modern humans with these technologies taking one or both of these routes into Korea?

Response: As we described in our paper (see lines 89-95), the migration model posits the existence of two migration routes, each associated with different types of tools. The introduction of new technologies, such as blades, is attributed to the northern route, while the southern route is considered to have brought forth older tool types. As a main difference to the *in situ* model, this migration model does not categorize stemmed points made out of flakes as true stemmed points. This perspective is rooted in the model's premise, which does not recognize the continuity of technology (lines 102-107). We edited the related paragraphs for clarification.

4. Assuming most of the stemmed points in the analyses are fragmented, how do we know that the authors took the "widest and thickest" parts of the points (lines 203-204); maybe explain here that in most cases only tips are missing?

Response: In Lee and Sano's paper (2019), they mentioned that they only examined the tanged points that retained the widest and thickest part of the specimens (lines 219-221 & Lee and Sano 2019). Similar to their approach, we excluded most of the broken pieces that lacked the widest part. However, we included artifacts with minor tip damage in our analysis. So we are confident in determining the maximum width. We have revised the text to provide greater clarity on this matter.

5. Table 1: without any evidence that poison was used in Late Paleolithic Korea, I don't see the utility in using the Poisoned arrow tip category. As it turns out, this category does not show up in the sample—might be best to ditch this.

Response: We agree that this category is not fully present in Korea. However we prefer to maintain this category on the plots for the sake of consistency and comparability with TCSA analyses conducted in other regions. We feel it's better that the global reader knows we also considered the poisoned arrow tips, rather than omit it and have the reader wonder if we considered it or not.

6. If it is true that the majority of stemmed points in the sample are broken, the weight as a proxy analysis seems flawed to me (and does not seem to show any differences in the results anyway), but if not complete how can make comparisons?

Response: As we mentioned in the previous studies section, there is a significant proportion of broken stemmed points discovered in Korea (lines 161-163). Consequently, for the analyses presented in this paper, we have excluded most of the broken artifacts. Each analysis uses a different number of artifacts and we marked those numbers in the method section. We only included complete pieces (n=152) to compare the weight as a proxy of artifact size, combined with raw material type.

Reviewer 2 :

1. On page 2, rows 37-38: The authors write, "This is related to the fact that stemmed points appear to originate from Korea and spread throughout Northeast Asia". I know stemmed points only in Korea and Japan. I'm afraid that "throughout Northeast Asia" is not accurate expression.

Response: We have edited the sentence.

2. On page 2, rows 38-39: I don't understand why stemmed points have a close association with site formation. The sentence requires clarification.

Response: Stemmed points could indicate certain tasks that the group of people performed as well as the function of the site such as serving as a hunting camp. We have revised 'site formation' to 'site function' to accurately reflect this aspect.

On page 2, rows 40-43: "Previous work mostly discussed their origin, the chronology of the Korean Late Paleolithic, and their relationship with the Japanese archipelago (Chang, 2013; Chong, 2021; Lee and Sano, 2019; Park, 2013)." As Lee and Sano (2019) undertook a use-wear analysis of stemmed points from the Jingeneul site, this paper should not cite here, but after the following sentence:

"Despite the importance of stemmed points, only a few studies to date have examined their likely uses." Akoshima and Hong (2018) also conducted an important microwear analysis of stemmed points from the Suyanggae site which the authors do not cite in the paper. The authors should cite this paper too. Akoshima and Hong 2018. Use-wear analysis of tanged points from the Suyanggae site, Locality I and Locality VI. In: Report on the Excavation of Suyanggae Site (Loc. I and VI), Danyang. Institute of Korean Prehistory.

Concerning the citations “(Chang, 2013; Chong, 2021; Lee and Sano, 2019; Park, 2013).”, instead of Lee and Sano (2019), I recommend the authors to cite the following paper, which discusses the relationship between Korean and Japanese stemmed points:

Morisaki et al., 2022. Examining frequency and directionality of Palaeolithic sea-crossing over the Korea/Tsushima Strait: a synthesis. *World Archaeology* 54 (2).

Response: We have edited the citations.

On page 3, row 122, and page 4, row 125: here the authors should cite the Morisaki et al. (2022) paper again for the Japanese stemmed points and Kakusuijyosekki.

Response: We have edited the citations.

On pages 4-5, “Previous Studies about the Function of Stemmed Points”: The authors introduce only morphological studies here, but no use-wear studies. However, at least as far as I know, there are two use-wear studies on Korean stemmed points; namely Akoshima and Hong (2018), and Lee and Sano (2019). Therefore, the authors should appropriately cite these use-wear studies here and give an overview of the results.

Response: We have added a paragraph for introducing the use-wear studies. Previously, we mentioned Lee and Sano’s use-wear analysis in the later section, “Tip Cross-Sectional Area”. Now their study about use-wear analysis is introduced in the “Previous Studies about the Function of Stemmed Points” section along with Akoshima and Hong’s research.

On page 5, rows 163-164: I suppose the Sibudu Cave is older than 50 ka.

Response: We have edited based on Lombard 2020.

On page 9, rows 443-446: Lee and Sano (2019) analyzed TCSA values only for the stemmed points with DIFs. This might be one reason why their TCSA values fall within a narrower range than those of the stemmed points analyzed by the authors.

Response: We have agreed with that possibility and edited that line 488.

On pages 19-20, “Discussion”: While the authors indicate that javelin tips and stabbing spear tips are the most probable ballistic uses for Korean stemmed points, they assumed that their wide range of the TCSA values might represent diverse roles in foraging toolkits. However, the wide range could also be reflected by the multiple projectile modes from thrusting, throwing, spearthrower-shooting, to bow-firing. Therefore, it is important to cite Akoshima and Hong (2018) which showed other functional use patterns of stemmed points than hunting. The Suyanggae and Jingeneul sites are located on different topographic, geographic regions one another and may have been occupied for different purposes in subsistence. The wide range of the TCSA values of the Suyanggae stemmed points might support the hypothesis.:

Response: We have embraced this perspective and have integrated it into our discussion. We have included additional sentences in lines 493-496 to reflect this viewpoint.

After addressing the issues raised by the reviewers, we believe that the overall quality of the paper has been significantly enhanced. We sincerely appreciate your invaluable comments and suggestions, which have been instrumental in improving our work.

Sincerely,
Gayoung Park