

Review Form 3

Journal Name:	Asian Journal of Probability and Statistics
Manuscript Number:	Ms_AJPAS_126107
Title of the Manuscript:	A New Modified Confidence Interval Estimate of Mean for Skewed Distribution: Applications and Simulation
Type of the Article	Original Research Article

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This journal’s peer review policy states that **NO** manuscript should be rejected only on the basis of ‘**lack of Novelty**’, provided the manuscript is scientifically robust and technically sound. To know the complete guidelines for the Peer Review process, reviewers are requested to visit this link:

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PART 1: Review Comments

Compulsory REVISION comments	Reviewer’s comment	Author’s Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.	<div>1. Give a name for the newly proposed estimator for confidence interval</div> <div>2. There is a confusion in using the terminology estimate and estimator. (Estimate will be used only when we have a sample of data, otherwise, we call as an estimator.</div> <div>3. Since the data for Eg. 2 is already available in the public domain, it is absolutely not necessary to give data, jut narrate that Mod ci validated and move to interpretation part, however, just inform for which random seed you got this sample of data is being generated.</div> <div>4. There is no clarity on how to estimate <math>\mu</math> from equation 11.</div> <div>5. Write clearly when this method can be adopted in a better way, because all skewed distribution will not have outliers.</div> <div>6. In, Eg. 2 if the population parameter is not captured in CI then it is no more a CI. Give a different criterion in this case which says the modified CI is best for the given scenario such as narrow interval, etc. Moreover, the results of Table 2. Shows that all CI’s are overlapping. Hence, there is no significant difference between the CI, it says all methods of equally effective in this example. But, to show the suitability of this new method for this particular example where the data is negatively skewed. In fact, for this example Mad t CI has the shortest CI, one could see for negatively skewed distribution Mad t CI proves to be best.</div> <div>7. Have you tried applying your methods for the data with outliers?</div> <div>8. Paper is written in the style of dissertation especially the way the applications were presented. More descriptions in terms of pros and cons of the new estimator must be discussed.</div> <div>9. Please justify the logic of choosing skewness levels such as 0.5, 1, 2, 4, 8, 12. Please refine choosing the level of skewness, choose a value negatively skewed (-0.5 to -1); severely negatively skewed ( &lt; -1); choose a value positively skewed (0.5 to 1); severely positively skewed ( &gt; +1);</div> <div>10. The authors didn’t mention how they have conducted the simulation, i.e. the platform i.e. software R.</div> <div>11. It would be better if the author submit the necessary files for evaluating the results in the table.</div>	<div>1. The newly proposed confidence interval estimator has been termed as <b>modified confidence interval (Mod-ci)</b></div> <div>2. The entire article has been clearly checked, and the <b>estimator</b> and <b>estimate</b> terminology have been fixed everywhere in this article. Just to have a note, interestingly, in the applied world estimator and estimate terminology are often used interchangeably. Thanks for pointing it out.</div> <div>3. Following the suggestion of the reviewer, data has been removed for example 2 since it is available in public domain. To address the estimation performance to relatively larger sample, the entire sample of Petal length in iris dataset (n=150), has been considered, which has negative and non-normal distribution. Any interested researchers all around the world can have access to the dataset and hence can verify the reported results and interpretations added in this article.</div> <div>4. <b>Equation 11 now has been changed to equation 13</b> in response to the suggestion made in reference to the question <b>Are subsections and structure of the manuscript appropriate?</b> However, in response to query 4), the answer is simple if used the algorithm below (<b>which has now been added towards the end of Section 3.</b>):</div> <div>Algorithm to choose <math>\hat{\mu}</math> is as follows: <b>(i)</b> Compute the sample mean <math>\bar{X}</math> and the sample median <math>\tilde{X}</math>, along with sample <math>\alpha</math>th and <math>(1 - \alpha)</math>th quantiles given by <math display="block">\hat{\xi}_{n\alpha} = X_{(n*\alpha)} \text{ and } \hat{\xi}_{n(1-\alpha)} = X_{(n*(1-\alpha))} \tag{14}</math>The observations at or below <math>\hat{\xi}_{n\alpha}</math>, or at or above <math>\hat{\xi}_{n(1-\alpha)}</math> are trimmed by the trimmed mean <math>\bar{X}_\alpha</math> in equation (8), in order to compute Trm-ci of equation (10). <b>(ii)</b> If the sample mean <math>\bar{X}</math> lies between <math>\hat{\xi}_{n\alpha}</math> and <math>\hat{\xi}_{n(1-\alpha)}</math>, then use <math>\hat{\mu} = \bar{X}</math>, otherwise, as an estimator use <math>\hat{\mu} = \tilde{X}</math>, the sample median, unlike</div>

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		<p>trimming any observations done by the trimmed mean <math>\bar{X}_\alpha</math> or Trm-ci.</p> <p>By the nature of the choice of the sample mean <math>\bar{X}</math> or sample median <math>\tilde{X}</math> for the point estimator <math>\hat{\mu}</math>, the information of end-point observations have been retained and utilized, without trimming of any observations and hence no information is being lost.</p> <p>5. From the noted performance of this method compared to other method utilized in Examples 1 and 2, and in simulation the new Mod-ci has been recommended for practicing if there is skewness in the data distribution.</p> <p>6. What is the definition of confidence interval estimator? A 95% confidence interval estimator is expected to capture the unknown mean <math>\mu</math> 95% of the times in repeated sampling. What does it mean? A few of 95% CIs may not capture the mean <math>\mu</math>. This is what is being checked by looking at the estimated coverage probability in simulation. The estimated coverage probability is the proportion of times over all simulations, a given confidence interval estimator captures the mean <math>\mu</math>. Yes, an estimator that does not have better coverage is not a good confidence interval estimator even it has the smallest width.</p> <p>7. No, data with outliers is not found. But, of course, the new Mod-ci will prevail as long as t-ci, Med-ci or Trm-ci works in the presence of outliers.</p> <p>8. It is noted in discussion of the simulation result and in conclusion that Mod-ci is as good as Med-ci and t-ci or better than Mad-ci and Trm-ci while dealing with skewness in the data. It has also been noted that for higher skewness (skewness<math>\geq</math>4), the estimation problem still exists and a search for a better estimation method is sought for so as to deal with data values with a very high skewness. However, Mod-ci gives the leverage of observing both mean and median while doing the estimation, and as such it provides some degree of confidence over other estimation procedures and hence is recommended for practicing while dealing with real-life with skewness.</p> <p>9. Skewness levels such as 0.5, 1, 2, 4, 8, 12 are arbitrarily chosen to study sensitivity of any methods, which is common practice in simulation studies. The skewness of gamma distribution with shape parameter <math>\beta</math> is <math>\gamma = 2/\sqrt{\beta}</math>. So, it does not make any sense to generate random values with skewness -0.5 to -1. And it is not required to do so.</p> <p>10. All computation and simulation have been performed using the statistical software R, and has been mentioned in Section 5 before Table 3.</p> <p>11. Not sure what is being suggested. Do you mean to provide code? If asked for, code could be provided.</p>
Is the title of the article suitable? (If not please suggest an alternative title)	A new modified confidence interval estimator of location parameter for skewed distribution  (In a paper, it is necessary to have a real-life application and simulation study as an integral part, so that need not come in the title)	Reviewer 1 and Reviewer 2 (Rev_AJPAS_126107) suggested minor changes in the title. The suggestion of Reviewer 2 “ <b>A new modified confidence interval estimator of location parameter for skewed distribution</b> ” has been adopted which seems very reasonable.

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Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.	Abstract must start with a background of the paper. Please include.	Abstract has been modified and re-written by accommodating this recommendation, where it has been explained clearly why the new method has been proposed and recommended over other methods.
Are subsections and structure of the manuscript appropriate?	Under section 3 (The new proposed t-CI), can be rewritten as the previous existing methods i.e. start with CI interval and then say how to estimate $\mu$ .	This recommendation has been taken into consideration and section 3 has been re-written, accordingly, starting with CI methods and then defining other relevant quantities in the CI equation.
Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.	The author should answer the queries. After a satisfactory reply to the comments; we can make a decision on this part.	Answers to relevant queries have been provided
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form. :-	How your new mod CI, Johnson (1978), Kleijnen et al. (1986), Meeden (1999), Willink (2005), Kibria (2006), Shi and Kibria (2007), Islam (2018) is different from yours, is it similar in estimating the CI or how robust is it? And how the robustness of the same was assessed.	The objective of this article has been to <b>compare only those rely on population estimators based on mean, median and trimmed mean</b> which has been made very clear in Abstract and Literature review due to the computational simplicity and popularity. <ul style="list-style-type: none"><li>- By comparing Johnson (1978), Kibria (2006) noted that the width of Student' t-ci and Johnson's methods are same. So, Johnson method has been disregarded in this study since it is not relevant to our objective</li><li>- The new Mod-ci is as good or better than Med-ci due to Kibria (2006)</li><li>- In Islam and Shapla (2018)'s method, trimmed mean has been considered. The new Mod-ci avoids trimming observations. In addition, Mod-ci is a simpler method compared to Islam and Shapla (2018). In Islam and Shapla (2018)'s method, a different version of Trm-ci has been considered. As this paper does not consider any trimming of observations, only the traditional Trm-ci has been utilized in this paper to avoid redundancy.</li></ul>
Minor REVISION comments  Is the language/English quality of the article suitable for scholarly communications?	Grammatical errors are there.	Grammatical errors have been taken care of and the article has been revisited thoroughly for the grammatical correctness.
Optional/General comments	Requires a Major; Need a satisfactory response to the comments is needed to further take a final decision	

PART 2:

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Are there ethical issues in this manuscript?	(If yes, Kindly please write down the ethical issues here in details)	<ul style="list-style-type: none"><li>- There are no ethical issues in relation to this article.</li><li>- All recommended modification has been taken care of, which has improved the presentation of the article to a great extent.</li><li>- Authors would like to thank the reviewers and editor for their valuable suggestions and recommendations towards the improvement of the article.</li></ul>