

To: Professor Douglas Montgomery

09/28/2020

Editor in Chief of Quality and Reliability Engineering International

From Saeed Maghsoodloo, Professor Emeritus of ISE,

3301D Shelby Center, Auburn University, AL

Subject: The Errata for the following already published article

Maghsoodloo S., On sigma estimators for the case of $M > 1$ Subgroups and quality control S Charts of varying sample sizes. *Qual Reliab engng Int.* 2020; 36:1751-1767. <http://doi.org/10.1002/qre>.

Dear Doug,

1 | My two errors are listed below and my sincere apologies to you , QREI, and Wiley Publications

- (i) On page 1756 of the article, lines 11 & 12: I have a symbolic-error in the definition of Kurtosis

$$kurt(R, n = 100) = \beta_4(R) - 3 = 3.39 - 3 = 0.39 \text{ (correct answer) ,}$$

while the correct resulting formula is given in my App. A on p. 1765 of Wiley publications (before App. B)

$$\beta_4(S_p) = \frac{\mu_4(S_p)}{[\mu_2(S_p)]^2} - 3 = \frac{\mu_4(S_p)}{(1 - C_4^2)^2} - 3$$

Please note that I have always used MathType Eq. Editor in all my articles, and at the age of nearly 82 will not be able to learn Latex because I find MathType Eq. Editor easier to type mathematical statistics.

I am lucky that I downloaded the above article from

wileyonlinelibrary.com/journal/qre

and read the article very carefully; the good side effects were that Wiley Publications' errors (albeit not major) caused me to rewrite the entire article in their style (with the help of Ms. Samira Shirzaei). These are extremely difficult times (Covid-19 and possibly 20), but I am almost 82 years old (my last years are near), and I know 3 to 4 years from now my Summary results at the bottom of p. 1763 of Wiley will be cited, and I wanted them to be concise.

- (ii) You well know that the statistical symbol μ_r' universally stands for the r^{th} raw (or origin) moment of an underlying distribution, i.e., $\mu_r' = E(X^r)$, where X represents a (single) univariate observation. My negligence in the App. A on pp. 1764-5 have now been clearly removed as the following revisions show:

" $\mu_1'(S_p) = E(S_p) = C_4 \times \sigma$, $\mu_2'(S_p) = E(S_p^2) = \sigma^2$. For the sake of simplicity of the following derivations of skewness and kurtosis, it is assumed that we are sampling a $N(\mu, 1)$, so that

$\mu_1'(S_p) = E(S_p) = C_4$ and $\mu_2'(S_p) = 1$. The third raw moment of S_p from a $N(\mu, 1)$ is given by

$$\mu_3'(S_p) = E(S_p^3) = E\left[\left(\sqrt{\sum_{i=1}^M \text{CSS}_i / \nu}\right)^3\right] = \nu^{-3/2} E\left[\left(\sqrt{\sum_{i=1}^M \text{CSS}_i}\right)^3\right] = \nu^{-3/2} E[(\chi_{\nu}^2)^{3/2}] = \nu^{-3/2} E[(W)^{3/2}],$$

where $W \sim \chi_{\nu}^2$ " end of quote. Note that I have now clearly distinguished between process origin moments and those of S_p .

2 | Wiley Publications' errors are listed below

(a) Please do not italicize all symbols because there are two capital m's: (i) M = Total number of subgroups, while the italicized capital m , (ii) " M ", stands for the no. of Lagrange constraints in App. C on pp. 1766-7. The italicized capital n stands for $N = \sum_{i=1}^M n_i$, while N stands for the underlying normal universe. There are several others such errors throughout the above article.

(a) It is illogical to start an article with $M > 1$ subgroups on p. 1751, and then revert back to $M = 1$ subgroup on p. 1754. I have corrected this problem in my revised version in totality. TABLE 1 (of QREI) belongs to my section with $M = 1$ not with $M > 1$ subgroups.

(b) Editorial error on p. 1755, lines 15 & 17.

(c) Wiley is using a symbol on p. 1758, line 18 that did not exist in my article.

(d) Some spacing need to be increased so that my expressions or writings are not jammed like on p. 1751.

(e) Major statistical error in the title of section 8 of Wiley because thought of the article I have distinguished between a process SE and a sample se.

(f) My style of writing in the past 48 years has been to list KEYWORDS in the order that were used in the article and not alphabetically, and the same with ABBREVIATIONS. Please do not alter if at all possible. Further, my revised version is more lucid than the already above published article.

Finally, it seems that there is an incongruence between the Auburn University's MathType Eq. Editor and that of Wiley's which I am not able to correct.

The above problems should not exist with the conditionally accepted manuscript with ID: QRE-20-0310 entitled "Quality Control Using the S^2 Chart for Subgroups of Unequal Sample Sizes" because my joint author, Ms. Shirzaei, and I make sure that our revisions are identical. We should be able to revise and resubmit our joint article by January 2021.

I am attaching my totally revised word.doc and please trust that I have removed all errors; all Wiley has to do is insert their logo and publish it.



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