

A Statistical Analysis of Iggeros Moshe, Orach Chaim 1:35

By: SHELDON EPSTEIN and DAVID GREENBERGER

The *Gemara*,¹ in describing the penchant of the early *Chachamim* to count the verses in the Torah, asserts that the middle verse of the Torah is *Vayikra* 13:33 and that in total there are 5,888 verses. Neither of these assertions is consistent with the breakdown of verses as we have them in our *Chumashim*, i.e., a total of 5,845 verses² and a middle verse of *Vayikra* 8:8. During the discussion of a related question, the *Gemara* suggests “we are not experts in verses” and most commentators use this statement to explain the discrepancy between

¹ קדושין ל. לפיכך נקראו ראשונים סופרים שהיו סופרים כל האותיות שבתורה, שהיו אומרים וא"ו (ויקרא יא) דגחון חציין של אותיות של ס"ת (ויקרא י) דרש דרש חציין של תיבות, (ויקרא יג) והתגלה של פסוקים... א"ל אביי פסוקי מיהא ליתו לימנוי בפסוקי נמי לא בקיאינן דכי אתא רב אחא בר אדא אמר במערבא פסקי ליה להאי קרא לתלתא פסוקי (שמות יט:ט) ויאמר יי אל-משה, הנה אנכי בא אליך בעב הענן, בעבור ישמע העם בדברי עמך, וגם-בך יאמינו לעולם; ויגד משה את-דברי העם, אל-... תנו רבנן חמשת אלפים ושמונה מאות ושמונים ושמונה פסוקים הוו פסוקי ס"ת יתר עליו תהלים שמונה חסר ממנו דברי הימים שמונה

² Most *Chumashim* indicate that there are 5,845 verses and offer a numerically equivalent “*siman*,” but an actual count shows 5,846 verses. A discussion of this type of discrepancy, which sometimes also appears in the number of verses in a *parashah* and the *parashah's siman*, is beyond the scope of this paper.

Sheldon Epstein is a Professor of Quantitative Analysis at Seton Hall University and teaches in the Seton Hall—Yeshivah Gedolah of Marine Park Brooklyn (Rabbi Avraham Zucker, Rosh haYeshiva) ITV Graduate program.

David Greenberger received his MBA from Seton Hall University's Graduate School of Business located in South Orange, New Jersey.

our text and the *Gemara's* assertions. In a recent article in *Hakirah*,³ it was argued that the 160-verse discrepancy between our middle verse and the one offered in the *Gemara* is too great to attribute to our lack of properly preserving our *mesorah* with regard to verses. An alternate interpretation of the *Gemara* was offered which showed how the *Gemara* and our *Chumashim* can be brought into complete agreement. The two ways of reading the *Gemara* has halachic ramifications. In this paper we discuss a responsum from Rav Moshe Feinstein that is based on this *Gemara*, and conduct a statistical study to see if his position is viable.

Iggeros Moshe Orach Chaim 1:35: "Reading Two Long Pesukim"

"At *Mincha* on *Shabbos Parashas Tazria*,⁴ the reader made a mistake and read only two verses for *Levi: Es HaTzippor* and *VeHizab*; and the one who was called up made the concluding blessing. I ruled that they should read for the *Yisrael*, the third *oleh*, again from *Es HaTzippor*, and call another *Yisrael* for *BaYom HaShmini*. Even though the *Acharonim* write that it is better in the case of a mistake like this to call up a second time the person for whom only two

³ "Symmetrically Designed Sifrei Torah: A Quantitative Analysis," Vol. 5, fall 2007, pp. 171–225.

⁴ Below is the prescribed reading for *parashas Metzora*:

ויקרא פרק יד: [כהן] (א) וידבר יי, אל-משה לאמר. (ב) זאת תהיה תורת המצרע, ביום טהרתו: והובא, אל-הכהן. (ג) ויצא, הכהן, אל-מחויץ, למחנה; וראה, הכהן, והנה נרפא נגע-הצרעת, מן-הצרוע. (ד) וצנה, הכהן, ולקח למטהר שתי-צפרים חיות, טהרות; ועץ ארז, ושני תולעת ואזב. (ה) וצנה, הכהן, ושחט, את-הצפור האחת--אל-קלי-הקש, על-מים חיים. (ו) את-הצפור החיה יקח אמה, ואת-עץ הארז ואת-שני התולעת ואת-האזב; וטבל אותם ואת הצפור החיה, בדם הצפור השחטה, על, המים החיים. (ז) והנה, על המטהר מן-הצרעת--שבע פעמים; וטהרו, ושלח את-הצפור החיה על-פני השדה. (ח) וכבס המטהר את-בגדיו וגלח את-כל-שערו, ורחץ במים וטהר, ואחר, יבוא אל-המחנה; וישב מחויץ לאהל, שבעת ימים. (ט) והיה ביום השביעי יגלח את-כל-שערו, את-ראשו ואת-זקנו ואת גבת עיניו, ואת-כל-שערו, יגלח; וכבס את-בגדיו, ורחץ את-בשרו במים--וטהר. [ישראל] (י) וביום השמיני, יקח שני קבשים תמימים, וכבשה אחת בת-שנתה, תמימה; ושלשה עשרונים, סלת מנחה בלולה בשמן, ולג אחד, שמן. (יא) והעמיד הכהן המטהר, את האיש המטהר--ואתם: לפני יי, פתח אהל מועד. (יב) ולקח הכהן את-הקבש האחד, והקריב אתו לאשם--ואת-לג השמן; והניף אתם תנופה לפני ה'.

verses were read (see *Magen Avraham Orach Chaim* 137:8 and *Taz* 4), it seems to me that there is a difference between short and long verses. For short verses that cannot be divided into three verses it is preferable to call the same person again because his previous reading is nothing. Even though he has already made a blessing, the blessing is certainly for naught. Therefore, why have him lose the benefit of a reading... But by [2] long verses that can be divided into three there is definitely [a possibility] that they are three. This is certainly so in the second half of the Torah which is after *Ve'Hisgalach* that the *Gemara Kiddushin* 30 says is the midway point in verses, and by us the midway point is *VaYepod Lo Bo* in *parashas Tzav*, which is 160 verses before *Ve'Hisgalach*. This means that the truth is that the verses from *Ve'Hisgalach* until the end of the Torah must be divided into an additional 160 verses. Also, we have 5,845 verses in the entire Torah, and the *Gemara* there says there are 5,888 verses. If so, it is possible that in truth these two verses are three and it is considered a "reading." Therefore, it is not proper that the reader should read a second time... Therefore, my thinking is that by long verses where the *Gemara* does not specifically say that they are [only] two verses we can treat them like three verses, and this is certainly the way we should rule in *parashos* after *Ve'Hisgalach*.⁵

⁵ The following is the full text of the responsum:

אגרות משה או"ח א:לה- בקרא רק שני פסוקים והם פסוקים גדולים: בש"ק במנחה דפי תזריע טעה הקורא וקרא ללוי רק ב' פסוקים, קרא ד'את הצפר וקרא ד'זהוה וברך כבר ברכה שלאחריו. והוריתי שיקרא לישראל שהוא השלישי מ'את הצפר בחזרה ואח"כ לקרות לעוד ישראל מ'וביום השמיני ואף שבאחרונים איתא שיותר טוב בטעות כזה לקרא עוד הפעם לאותו שקרא הב' פסוקים עיין במ"א סי' קלז סק"ח ובט"ז ס"ק ד נראה לענ"ד שיש חילוק בין פסוקים קטנים לגדולים דבפסוקים קטנים שא"א לחלקם לג' פסוקים יותר טוב לקרא לאותו עצמו כיון שהקריאה שכבר קרא אינו כלום ואף שכבר בירך היו הברכות ודאי לבטלה ולכן מ"ט נפסידו זכות קריאתו גם במנחה בשבת בשני וחמישי יש עוד טעם שלא יטעו שיכולים להוסיף עוד רביעי ובלוי וכהן יש עוד טעם שהרי ימצא שלא קרא לוי וכהן אבל בפסוקים גדולים שיש לחלקם לשלשה שודאי הוא ספק אצלינו שמא הם שלשה וכ"ש מחצי השניה של הס"ת שאחר והתגלה שמפורש בגמ' בקידושין דף ל שהוא חצי התורה בפסוקים ואצלינו החצי הוא ויאפד לו בו בפרשת צו שהוא קס' פסוקים קודם והתגלה שנמצא שהאמת הוא שצריך לחלק הפסוקים מוהתגלה עד סוף התורה עוד לק"ס פסוקים וגם אצלינו יש ה' אלפים ותתמ"ה פסוקים בכל התורה ובגמ' שם איתא האלפים ותתפ"ח פסוקים וא"כ אפשר שיש באמת בשני פסוקים גדולים אלו שלשה פסוקים שנחשבו קריאה וא"כ אין ראוי שאותו הקורא יקרא עוד פעם דרך שא"א בענין אחר

A Numerical Review of Rav Moshe's Position

Table 1 lists the discrepancy between the various claims given in the *Gemara* and what actually appears in our *Chumashim*.

Table 1

Gemara vs. Actual

<u>Property</u>	<u>According to Gemara</u>	<u>In our Chumash</u>	<u>Difference</u>
Verses in Torah	5,888	5,845	43 Verses
Middle Verse	ויקרא יג:לג	ויקרא ח:ה	160 Verses
Number of Middle Verse	2,944	2,923	21 Verses

Because in our count the *Gemara's* middle verse is 160 verses after the middle verse of our *Chumashim*, Rav Moshe says that it requires an additional 160 verses in the latter half of our *Chumashim* to bring our system into conformity with the *Gemara*. In fact, to have our *Chumashim* conform exactly to the model presented in the *Gemara* requires both the combining as well as the dividing of verses in the following manner:

- 1) The number of verses in the *Chumash* from the beginning of *Bereishis* until *Vayikra* 13:33 must be reduced by 139 (or 4.5%).
Explanation: Since the *Gemara* claims that *Vayikra* 13:33 is the midpoint of 5,888 verses, it must be the 2,944th verse.⁶ Since our *Chumash* has 5,845 verses, its middle

קורא עוד פעם כגון בכהן שקורא פעם ב' כשליכא לוי וכן כשליכא רק אחד שיודע לקרות בסוף סימן קמ"ג. ולכן אף שצריך לקרא עוד הפעם משום דשמא אינם רק ב' פסוקים יקראו אחר ואף שאם הם ג' פסוקים יקראו אחר ואף שאם הם ג' פסוקים ימצא שקראו ד' הא חסרון זה הוא אף כשיקרא הוא עצמו אם הם ג' פסוקים, וזה שימצא אם אינם רק ב' פסוקים שלא קרא לוי ג"כ אינו כלום דטעם אנצויי לא שייך בכאן כיון שכבר קראוהו ולכן לע"ד בפסוקים גדולים שלא מפורש בגמרא שהם רק שני פסוקים יש להורות לקרא אחר וכ"ש בפרשת שלאחר והתגלה שיש להורות כן.

⁶ We will not concern ourselves here with the question of whether there is an even or odd number of verses and the definition of the middle

verse, *Vayikra* 8:8, is the 2,923rd. Thus, the *Gemara's* middle verse is the 3,083rd verse in our *Chumash* (i.e., 2,923+160). To have our 3,083rd be the *Gemara's* 2,944th requires dropping 139 verses (i.e., combining verses in the first half of the *Chumash* in a way that reduces the number of verses by 139).

- 2) The number of verses in the *Chumash* from *Vayikra* 13:33 until the end must be increased by 182 (i.e., 6.6%).
Explanation: The *Gemara* claims 2,944 verses after *Vayikra* 13:33 and we have only 2,762 (i.e., 5,845-3,083).

The 139 consolidations and 182 separations we mention are lower limits to what is required to bring our *Chumashim* into conformity. It is possible that in the first half of the *Chumash* verses have been incorrectly combined, thus requiring more than 139 consolidations after these corrections are made. Note, for example, that the *Gemara's* proof that our verses' division is wrong is from *Shemos* 19:9 in the first half of the Torah, where 3 verses are considered by us to be 1. If this is correct, then we will need to consolidate at least 141 verses to make up for the additional improperly dropped verses. Thus, Rav Moshe's need for 160 additional verses in the latter half of the Torah is an undercount, i.e., we need at least 182 (making his position even stronger) and might need more if some verses in the latter half have been incorrectly consolidated.

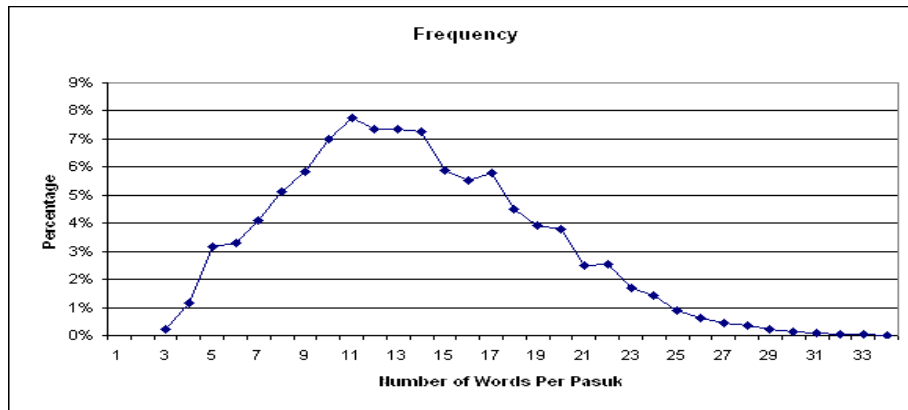
The Long and Short Verses

Rav Moshe says that the most likely candidates for splitting are the "long" verses. However, he never defines "long." To get a better understanding of the issue, we conducted a statistical analysis of verses' word length based on our *Chumashim*. Graph 1 shows the percentage of verses of each word length in the Torah. The smallest verse in terms of word size has 3 words and the largest 34 words. The distribution is nearly unimodal, skewed to the right, and the decline in the right tail is gradual and orderly. There seems to be few if any points

verse in an even-numbered *Chumash*. Our numbers are thus general and may be off by 1.

on the graph that indicate “unexpected” observations of questionable origin. The distribution has a mean verse size of a little more than $13\frac{1}{2}$ words and a standard deviation of a little under 5.3 words. We generally expect less than 1% of the observations to lie more than 3 standard deviations (SD) on either side of the mean. Since there are 5,888 verses, this would mean that we would expect about 294 verses (i.e., $.5\% * 5,888$) to have more than 30 (i.e., $13.5 + 3 * 5.3$) words. Table 2 shows that there are only 20 verses with 30 or more words and that they are equally distributed (i.e., 10) in both halves of *Chumash*.

Graph 1: Distribution of Verses’ Length in Torah⁷



⁷ There are some differences between verses’ length in each *Chumash* but they are all generally in the same range, i.e.,

ספר	Verses in ספר	Min	Max	Mean	Std. Dev.
בראשית	1533	3	32	13.427	3.795
שמות	1210	3	34	13.899	4.151
ויקרא	859	3	31	13.194	5.208
במדבר	1288	3	30	12.710	5.476
דברים	956	3	32	14.897	4.716
Total	5846	3	34	13.679	4.284

Verses in the Torah with 30 or More Words

<u># Words</u>	<u>First Half of Torah</u>	<u>Second Half of Torah</u>
34	Shemos 32:1	
33	Shemos 7:19	
	Shemos 34:10	
32	Bereishis 8:21	Devarim 13: 6
31	Shemos 22:8	Vayikra 16:21
	Vayikra 8:30	Devarim 4:10
		Devarim 22:24
		Devarim 31:21
30	Bereishis 36:6	Bamidbar 5:15
	Bereishis 37:2	Bamidbar 8:19
	Shemos 16:3	Bamidbar 14:14
	Vayikra 5:11	Bamidbar 35:5
		Devarim 29:17
Number Over 30	10	10

It is clear from Graph 1 and Table 2 that if we are to find the missing verses it is not going to be in the longest verses, i.e., those more than 3 standard deviations (SD) above the mean, of which there are only 10. We note that the verse the *Gemara* in *Kiddushin* splits into 3, has 26 words, and Rav Moshe's language

וא"כ אפשר שיש באמת בשני פסוקים גדולים אלו שלשה פסוקים.

implies that it is not only the 24-word first verse of the *aliyah* (i.e., ... את הצפר) he is targeting, but the second verse והזה that has 15 words as well. To validate Rav Moshe's position, we will investigate if the differential in "long" and "short" verses between the first and second halves of the Torah is sufficient to accommodate a consolidation of 139 verses in the first half of the Torah and the accruing of at least 182 verses in the second half. In performing this analysis, we must keep in mind that there is no reason to assume it is more likely for a long verse in the second half to be 2 verses than an equal-sized verse in the first half. For Rav Moshe's approach to work, there must be a considerably greater number of long verses in the second half than in the first half to make up for at least 182 missing verses. Table 3 below shows that the data is not consistent with Rav Moshe's hypothe-

sis. In Table 3, the range of verses' word size is broken into intervals that roughly match the Standard Deviation of the distribution and the number of verses in each category, in both the first and second half of the Torah, is given.

Table 3

Number of Verses in Each Half of the Torah Based on Word Size

<u>Verse Size/ Words</u>	<u>First Half</u>	<u>Second Half</u>	<u>First Half- Second Half</u>	<u>Distance from Mean/SD</u>
3 to 7	316	382	66	2 SD to 1 SD below Mean
8 to 13	1274	1089	-185	Mean to 1 SD below Mean
14 to 19	1078	843	-235	Mean to 1 SD above Mean
20 to 25	365	382	17	1 SD to 2 SD above Mean
26 to 30	43	63	20	2 SD to 3 SD above Mean
31 to 34	6	5		3 SD to 4 SD above Mean
Total				

Note that there are only 37 more verses above 1 SD from the mean in the second half than in the first half. Clearly this is not enough to account for the 182 missing verses. The most pronounced imbalances between the number of verses of a category size in both halves of the Torah are for those categories that lie within 1 SD on either side of the mean. However, in both cases, the first half has far more such verses than the second half. Finally, if we consider that some verses that currently appear as 2 or more verses are actually one (as needed to decrease the number of verses in the first half of the Torah), we find that it is, in fact, the second half of the Torah that has the larger number of very short verses (i.e., 1 to 2 SD below the mean).

Alternative Reading

We have until now assumed that when Rav Moshe mentions “long” verse or “short” verse he is referring to the number of words in the verse. However, perhaps we can interpret what he says as not referring to the number of words in a verse, but, rather, “long” refers to a verse that appears to be easily read as 2 verses. For example, the verse in *Metzora* that Rav Moshe mentions

ו אַת-הַצֶּפֶר הַחֲזֵה יִקַּח אֹתָהּ, וְאֶת-עֵץ הָאֶרֶז וְאֶת-שְׁנֵי הַתּוֹלְעֹת וְאֶת-הָאֵזֹב;
וְטָבַל אוֹתָם וְאֶת הַצֶּפֶר הַחֲזֵה, בְּדָם הַצֶּפֶר הַשְּׁחֻטָּה, עַל הַמַּיִם הַחַיִּים.

sounds like it can easily be broken after the word האזוב; and would be considered long. On the other hand, an even longer verse (*Shemos* 16:3) with 30 words:

וַיֹּאמְרוּ אֲלֵהֶם בְּנֵי יִשְׂרָאֵל, מִי-יִתֵּן מוֹתָנוּ בְּיַד-יְיָ בְּאֶרֶץ מִצְרַיִם, כְּשֶׁבָתָנוּ
עַל-סִיר הַבֶּשֶׂר, בְּאֶקְלָנוּ לָחֶם לְשִׁבְעָה: כִּי-הוֹצֵאתָם אֶתָנוּ אֶל-הַמִּדְבָּר הַזֶּה,
לְהַמִּית אֶת-כָּל-הַקָּהָל הַזֶּה בְּרָעָב.

does not appear to be readily broken into 2 verses, and Rav Moshe would not call this a “long” verse. If this was, in fact, Rav Moshe’s intention, it would explain why he did not define the “length” of a “long” verse.

It is our feeling that such a reading of Rav Moshe’s responsum is not correct. Had this been his intention, he would have had to explain this and at least say why he thinks the verse of את הצפר can be broken up, and offer some general guidelines as to how to recognize verses that are “breakable.” As far as we know, there is no precise definition of what constitutes a verse. The term is not synonymous with the English word “sentence,” and does not require a subject, predicate, or verb. The lack of Rav Moshe offering a definition of a verse is, in our opinion, a greater omission than his never defining how many words are required to make a verse long.

As a result of the above analysis, we find Rav Moshe’s justification of his decision based on *Kiddushin* 30a to be tenuous at best. Moreover, we agree with the point made in the *Hakirah* article that it is most probable that the *Gemara* in *Kiddushin* does not mean to imply that our verse breakdown is flawed and thus cannot be used as a means of overturning a well-established *halachah*. ❧