The Twin Towers Experiment: Simplification and Reinforcement

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Abstract

This paper follows our previous research [4]. In the present paper, we report on an experiment with a much simpler design.

The pattern we study here is a cluster of related key words in the form of ELSs in a single table. The cluster that we discover contains a subset of all key words obtained in the data collection. We account for the choices needed to determine this subset using the Bonferroni inequality. Our protocol involves some other explicit choices, accounted for in a similar way. The final p-level is 5.4×10^{-7}

1. Introduction

1.1. Background

Torah Code research studies the evidence that the text of Torah (the first five books of the Hebrew Bible) contains a hidden encoded text that describes world reality (cf. [3], Ch. 5). The clustering of equidistant letter sequences (ELSs) for key words related to a certain topic is one of the effects providing such evidence (see discussion in [5], p.429).

The event we have chosen for the present experiment is the Twin Towers attack. Since a reasonable choice of key words is not unique, we used the key words appearing in the actual newspaper headlines reporting the attack.

Figure 1 displays the headlines from a major Israeli newspaper, *Maariv*, on September 12, 2001. We show the English translation in Figure 2.

1.2. Basic notions

To form an ELS from a text, we ignore all punctuation and inter-word spaces. For example, the ELS "tin tops" can be found starting with the first "t" in the word "punctuation" in the preceding sentence, and using a skip of +4 (that is, counting forward every 4 letters from the starting position).

To graphically present ELSs, we use tables where the text is arranged with rows of equal length, with all spaces removed (see Figure 3, where the rows are of length 36). On such a table, the letters of an ELS form a straight line, unless the ELS wraps around the table. In particular, an ELS with skip 36 will appear vertically on the table.

By a cluster we mean a grouping of ELSs, an example of which is also seen in Figure 3.

2. Description of the experiment

2.1. Analysis of the headlines

To keep our experiment as simple as possible, we concentrate on the nouns in their basic form.

In [4], we divided the nouns into four categories. The first category contained the primary (most relevant) nouns (highlighted in red): Twin Towers, airplane, airplanes, terror attack. The second category contained the relevant proper nouns not included in the first category (highlighted in green): America, New York, Pentagon, Pennsylvania, US, Osama bin Laden. The third category contained the secondary (other relevant) nouns (highlighted in purple): horror, shock, victims, dead, ruins, mourning. The fourth category contained all other nouns, not highlighted since they are not immediately relevant to the incident.

For the current work, we simplify by treating all of the relevant nouns (the first three categories) as a single set.

As in [4], we follow the spelling of the newspaper exactly as it appears, and we delete the definite article whenever possible (however, we cannot delete its use with *Twin Towers* for grammatical reasons).

2.2. Measuring the cluster

Rather than using two different measurements as in [4], we are now able to use the one-dimensional (1D) measurement alone, because of a software upgrade described in the

אמריקה בוערת

הזוועה, ההלם, הקורבנות

אי אפשר להאמין

מתקפת הטרור הגדולה בהיסטוריה התרחשה אתמול ■ שני מטוסים חטופים התפוצצו על מגדלי התאומים בניו־יורק וגרמו לקריסתם; מטוס שלישי התפוצץ בפנטגון; רביעי התרסק בפנסילבניה ■ הערכות ראשונות: בין 10,000 ל־25,000 הרוגים, יותר מ־25,000 לכודים בהריסות ■ הנשיא בוש הוטס למטה המלחמה האטומית בנברסקה ■ נמלי התעופה בכל ארה"ב נסגרו; הגבולות עם קנדה ומקסיקו ננעלו ■ החשוד המיידי: אוסמה בן־לאדן ■ הפיצוצות בבירת אפגניסטן; ארה"ב: זה לא אנחנו ■ יום אבל לאומי בישראל – פרס: "זה כמו פיצוץ אטום"; אלפי פלשתינים חגגו ברחובות

Figure 1. The Twin Towers headlines as they appeared in the Hebrew Newspaper "*Maariv*", 12 September 2001.

America is Burning
The horror, the shock, the victims
Impossible to Believe

The biggest **terror attack** in history happened yesterday. Two hijacked **airplanes** exploded into the **Twin Towers** in **New York** and caused their collapse. A third **airplane** exploded into the **Pentagon**. A fourth crashed in **Pennsylvania**. First estimates: between 10,000 and 25,000 **dead**; more than 25,000 trapped in the **ruins**. President Bush flew to the headquarters of atomic war in Nebraska. All airports in the U.S. were closed; the borders with Canada and Mexico were locked. The initial suspect: **Osama bin Laden**. The explosions in the capitol of Afghanistan: U.S.: it is not us. National day of **mourning** in Israel – Peres: "it is like an atomic bomb"; thousands of Palestinians celebrated in the streets.

Figure 2. The translation of the "*Maariv*" headlines

next section. The 1D compactness measure is a score approximating the probability that the text contains a short segment within which we find such a densely arranged cluster of the ELSs of interest.

To estimate the significance of the cluster, we compare it to analogous clusters in a control population. For this, we use the ELS Random Placement (ERP) method developed by Professor Haralick, and we refer to [1], section 14 for precise definitions. In summary, each member of the control population is created by randomly translating the locations of the original ELSs found in the Torah, and preserving their skips. The most compact 1D cluster is identified in the original text and its compactness measurement is compared to the same measurement for each control text.

Using this protocol, we are able to test the Null Hypothesis of no Torah Code effect against the Alternative Hypothesis that there are one or more unusually compact 1D clusters containing ELSs of the key words.

2.3. The experimental design

The pattern that we try to detect is the existence of an unusually compact cluster. Since not all of the key words may be present in a cluster (for example, the encoded text might use words other than the newspaper key words), we must check for the clustering of subsets of our key words. In contrast with [4], our 1D software now automatically finds the best subset, avoiding the need to manually attempt various subsets on our own. This new capability is the key to our current simplified protocol. The details for measuring the compactness of each subset of key words found in a text is described in the Appendix.

Our protocol allows for searching in the whole Torah or in any of the five books of Torah separately.

We account for this and other choices in section 2.7.

2.4. The list of key words

Table 1 shows the full list of all relevant key words described above in section 2.1.

	Hebrew Key Words	English Translation
1	מגדלי	Twin
2	התאומים	Towers
3	טרור	terror
4	מתקפת	attack
5	מטוס	airplane
6	מטוסימ	airplanes
7	אמריקה	America
8	ניו יורק	New York
9	פנטגון	Pentagon
10	פנסילבניה	Pennsylvania
11	ארה”ב	U.S.
12	אוסמה	Osama
13	בן לאדן	bin Laden
14	זוועה	horror
15	הלם	shock
16	קורבנות	victims
17	הרוגים	dead (plural)
18	הריסות	ruins
19	אבל	mourning

Table 1: List of Key Words

We consider only clusters that include both of the key words “Twin” and “Towers”. We omit the 3-letter words (shock) and (mourning) from our experiment because they appear practically everywhere.

2.5. Outcome of the experiment

Seven words from the above noun list, *Twin Towers, airplane, attack, horror, dead, ruins*, appear in a compact ELS cluster of length 738 in the Torah (see Figure 3).

Our 1D software found only 13 more compact clusters in an ERP text population of size 300 million, giving a raw significance value $p = 4.5 \times 10^{-8}$ (before the adjustments of 2.7).

2.6. The choice factors

A factor of 3 accounts for our choice of the *Maariv* headlines – there are two other major Hebrew newspapers in Israel (*Haaretz* and *Yedioth*).

In [4], we originally used a factor of 6 to account for the choice of searching in any of the five books of Torah, or in the entire Torah. Our choice was the Book of Numbers. However, the decision process is better modeled by creating a hierarchical decision tree that reflects all Bonferroni choices. The first decision is whether to search on the whole Torah or on a separate book. In case one chooses to search in a separate book, there are 5 possible choices. This suggests a factor of 2 for the choice of the whole Torah and a factor of 10 for each of the five books of Torah. For the current 1D measurement we choose the whole Torah.

A factor of 2 accounts for our choice to use a minimal skip of 2 rather than 1 for all key words. This is not a change from [4], but we explicitly account for it here.

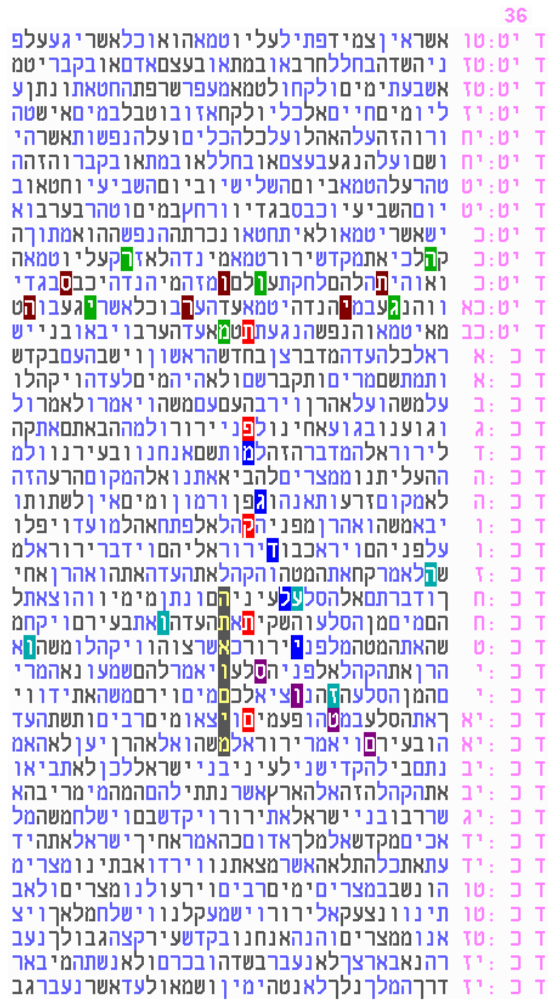

Figure 3. The most compact 1D cluster in Torah

2.7. Adjustments and final result

In this section, we apply the Bonferroni inequality.

We multiply the raw significance value 4.5×10^{-8} by the 3 factors from section 2.6, obtaining $p = 5.4 \times 10^{-7}$ (see [2], section 2.2 for more details on the Bonferroni bound).

We therefore reject the Null Hypothesis in favor of the Alternative Hypothesis.

2.8. Discussion

A visual display of the pertinent ELSs in the book of Numbers is available at `http://www.torahcodes.net/view_twin.ppt`. In agreement with the mathematical result, the visual result is dramatically different from the expectation of more or less uniform distribution. Our cluster appears on slides 50 and 51, with very few ELSs appearing on the other slides (we do not show ELS's with a span exceeding 1000 letters, since we are interested in a clustering phenomenon that manifests in one small area of the text). A similar picture occurs in the other books of Torah.

The current work is an essential improvement of the design from the original ([4]):

1. Replacing the three lists of key words used in [4] by one joint list eliminates the decisions needed to form key word subsets.
2. Since we perform only one measurement, there is no need for Fisher statistics.
3. For a 1D measurement, only 2 input parameters are needed, which also improves the design.

In addition to being a simplification, the new design also yields a more significant outcome: each choice factor that is avoided reduces the use of the Bonferroni inequality, thereby reducing the upper bound of the total result.

3. Parameter settings

Following are the two parameter settings that we use for the 1D measurement:

- We retain the expected number of ELSs = 10, as in [5]. That is, for each key word, we impose a limit on the skip such that approximately 10 ELS occurrences are expected for the key word in a text the size of Torah.[1]
- We use a minimal skip of 2 for all key words.

Appendix: Description of the 1D Calculation

Assume we consider a text of length L. We are given key words $W_1, W_2, \ldots, W_k$, of length $l_1, l_2, \ldots, l_k$, respectively. For each key word W_i we have ELSs with skips $d_{i_1}, d_{i_2}, \ldots, d_{ij(i)}$. Assume these ELSs are uniformly distributed in the text. For a given S, what are the odds that some segment of the text of length S contains ELSs for all the key words $W_1, W_2, \ldots, W_k$?

The above data obviously defines a probability space.

We are looking at the event E that a fixed segment of the text of length S contains ELSs for all key words $W_1, W_2, \ldots, W_k$ such that some of the ELSs uses the *first letter* of this segment. Let E_i denote the case when this first letter belongs to an ELS for the key word W_i. In what follows, we are going to ignore the intersections of E_i with E_h for $i \neq h$. The event E is the union of $E_1, E_2, \ldots, E_k$. Now we are going to estimate the measure of E_i in our probability space. Let us do so for $i = 1$, and the rest is similar.

First notice that an ELS of length l with skip d has the span $d(l-1)+1$. Correspondingly, it has $L - d(l-1)$ placements in the text of length L. If $d(l-1)+1 \leq S$, it has $S - d(l-1)$ placements in the fixed segment of length S.

Under our uniformity assumptions, we obtain that if $d_{ih}(l_i - 1) + 1 \leq S$, then the odds for the ELS number h of the key word W_i to appear inside our fixed segment are $(S - d_{ih}(l_i-1))/(L - d_{ih}(l_i - 1))$. Denote this number by P_{ih}. If $d_{ih}(l_i-1)+1 > S$, we set $P_{ih} = 0$. Let $T_i = 1 - \prod_{h=1}^{j(i)}(1 - P_{ih})$. T_i is the probability that at least one of the ELSs for W_i is placed inside our fixed segment of length S.

The probability $Pr(E_1)$ of the event E_1 is given by the product of $T_2, T_3, \ldots, T_k$. Similarly, the probability $Pr(E_i)$ of the event E_i is the product of all $T_1, T_2, \ldots, T_k$ with the exclusion of T_i.

Denote by $n(i)$ the number of ELSs for W_i such that their spans does not exceed S. Then for (almost) any placements of the ELSs for W_i, $n(i)$ initial letters of these ELSs can serve as initial letters of the fixed segment of length S. The probability that at least one of them contains the ELSs for all the key words is $1 - (1 - Pr(E_i))n(i) = Z_i$. Take $Z = 1 - \prod_{i=1}^{k}(1 - Z_i)$. Z is our final answer.

[1] However, this is not the only possible option; for example, we could completely eliminate this parameter, thereby simply accepting the most dense arrangement found in the text.

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