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Author(s): Boyd F. Edwards and W. Farrell Edwards

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**Abstract:** In 1969, John W. Welch reported his discovery of many-element chiasms in the Book of Mormon, which Joseph Smith testified to have translated from plates written anciently by Hebrew descendants. Chiasmus is an inverted-parallel literary form that was employed by ancient Hebrew biblical writers, among others. An instance of this form, called a “chiasm,” presents two or more literary elements, and then restates them in reverse order. Short chiasms are not uncommon in literature. In some cases, the authors undoubtedly intended to use that form for literary effect (that is, by design); in other cases, the elements fell into that form without author intent (that is, by chance).



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# Does Chiasmus Appear in the Book of Mormon by Chance?

*Boyd F. Edwards and W. Farrell Edwards*

Chiasmus is an inverted-parallel literary form that was employed by ancient Hebrew biblical writers, among others. An instance of this form, called a “chiasm,” presents two or more literary elements, and then restates them in reverse order. For example, Matthew 10:39 is a two-element chiasm:

## EXAMPLE 1

He that (a) **findeth his life** shall (b) **lose it**:  
And and he that (b) **loseth his life** for my sake shall (a) **find it**.

Short chiasms are not uncommon in literature. In some cases, the authors undoubtedly intended to use that form for literary effect (that is, by design); in other cases, the elements fell into that form without author intent (that is, by chance).

In 1969, John W. Welch reported his discovery of many-element chiasms in the Book of Mormon,<sup>1</sup> which Joseph Smith testified to have translated from plates written anciently by Hebrew descendants. One of Welch’s discoveries is Mosiah 5:10–12, displayed here as a seven-element chiasm (boldface words are chiastic elements; italicized words are extra appearances of chiastic elements or appearances of nonchiastic elements):

## EXAMPLE 2

(a) whosoever shall not take upon them him the **name** of Christ  
(b) must be **called** by some other *name*;  
(c) therefore, he **findeth himself on the left hand of God**.  
(d) And **I would that ye should remember** also, that this is the *name*

- (e) that **I said** I should give unto you
- (f) that **never should be blotted out**,
- (g) except it be through **transgression**;
- (g') therefore, take heed that ye do not **transgress**,
- (f') that the *name* **be not blotted out** of your *hearts*.
- (e') **I say** unto you,
- (d') **I would that ye should remember** to retain the *name* written always  
in your *hearts*,
- (c') that ye are not **found on the left hand of God**,
- (b') but that ye hear and know the voice by which ye shall be **called**,
- (a') and also, the **name** by which he shall *call* you.

The historical record has yielded no direct evidence that Joseph Smith actually knew about chiasmus when he translated the Book of Mormon in 1829, although some other people at that time did.<sup>2</sup> If he did not know about chiasmus, then its presence in the book might be considered as evidence for the authenticity of the book as a modern translation of a record written anciently by those familiar with the chiastic style.<sup>3</sup>

Sandra Tanner and Daniel Vogel argue against any such use of chiasmus as evidence of ancient origins by pointing out that the chiastic style was present in the Bible and other works for Joseph Smith to notice in his own study.<sup>4</sup> As evidence that he knew about this style, they point out that chiasms can be found in the Doctrine and Covenants, which Joseph Smith published in 1835, not as a translation of ancient text, but as a collection of modern instructions. Tanner cites Blake Ostler, who lists chiasms in the Doctrine and Covenants and in the Book of Abraham.<sup>5</sup> One of these is a five-element chiasm in Doctrine and Covenants 88:34–39, which was examined earlier by Richard Shipp:<sup>6</sup>

#### EXAMPLE 3

- (a) And again, verily I say unto you, that which is governed by **law** is also preserved by **law** and perfected and sanctified by the same. That which breaketh a **law**, and **abideth** not by **law**, but seeketh to become a **law** unto itself, and willeth to **abide** in sin, and altogether **abideth** in sin, cannot be sanctified by **law**, neither by mercy, justice, nor judgment. Therefore, they must remain filthy still.
- (b) **All kingdoms have a law given**;
- (c) And there are many **kingdoms**;
- (d) for **there is no space**
- (e) in the which **there is no kingdom**,
- (e') and **there is no kingdom**
- (d') in which **there is no space**,
- (c') either a greater or a lesser **kingdom**.

- (b') And **unto every kingdom is given a law**;  
(a') and unto every **law** there are certain bounds also and conditions. All beings who **abide** not in those conditions are not justified.

Welch argues in favor of ancient origins for Book of Mormon chiasmus, demonstrating that public awareness of this style was slight in America when the Book of Mormon was translated.<sup>7</sup> He maintains that it is unlikely that Joseph Smith knew of scholarly biblical works published in the 1820s that explored or described this style, three having been published and reviewed in England and one reprinted in America. He argues further that it would have been quite remarkable if Joseph Smith had noticed chiasmus on his own and had fluently incorporated it into his writing style. Welch regards instances of chiasmus in the Doctrine and Covenants as less compelling than those in the Book of Mormon and as likely to be arrangements of words that happen to fall into chiastic order by chance or as a secondary characteristic of some other mode of expression.<sup>8</sup>

Others agree that Joseph Smith likely did not know about chiasmus but argue that chiasms even in the Book of Mormon are likely to be arrangements of words that happen to fall into chiastic order by chance and are revealed only by the ingenuity of the analyst.<sup>9</sup> Brent Metcalfe has said, "Organizing these ideas into chiasms may be the result of subsequent interpreters rather than the intention of the original author."<sup>10</sup> [To see supplemental material 1 click here](#)

An anonymous author similarly suggests that chiasms in the Book of Mormon are the "result of the incredible amount of repetition contained therein, and are well within the bounds of probability."<sup>11</sup> That person maintains that it should not be surprising to find chiasmus in the Book of Mormon because unintentional chiastic structure can be found in almost any passage of text, as long as it involves some repetition of literary elements. The author illustrates this claim with a four-element "chiasm" found in the introduction to a computer manual, the *INFORMIX-OnLine Database Administrator's Guide*.

Our analysis of the same text proffers a nine-element chiastic structure, albeit with considerable extra repetition (in italics). The original four-element chiasm contained elements a, c, f, and h.

**EXAMPLE 4**

- (a) *OnLine* is a server for client **applications**.  
(b) More specifically, **OnLine** is a *database server*  
(c) that **processes** requests for data from client applications.  
(d) It *accesses* the *requested information* from its *databases*, if possible, and sends back the results.

- (e) **Accessing**
  - (f) the **database** includes activities such as coordinating concurrent *requests* from multiple *clients*, performing read and write operations to the *databases*, and enforcing physical and logical consistency on the *data*.
  - (g) The **client**
    - (h) is an *application program* that a user runs
    - (i) to **request information** from a *database*.
    - (i') *Client applications* use Structured Query Language (SQL) to send **requests** for *data* to *OnLine*.
    - (h') *Client programs* include the DB-Access utility and *programs* that you write using INFORMIX-ESQL/C, INFORMIX-4GL, or INFORMIX-NewEra.
    - (g') **Client processes** are independent of *OnLine processes*.
    - (f') **Database** users run *client applications* as the need arises
    - (e') to **access**
    - (d') **information**.
    - (c') The *OnLine* administrator starts the *OnLine processes* by executing the oninit utility.
    - (b') **OnLine processes** are presumed to execute continuously during the period that users *access* the *databases*. See Chapter 10, "What is the Dynamic Scalable Architecture" for a description of the *OnLine processes*,
    - (a') and the methods by which they serve *client applications*.

Shipp argues that Joseph Smith did not know about chiasmus but regards chiastic and parallel structures in the Doctrine and Covenants as significant, deliberate constructions that originated in the mind of God and were communicated to Joseph Smith by revelation.<sup>12</sup> He points out as evidence that Joseph Smith dictated structured revelations publicly, without the opportunity for premeditated organization of thought or text. He maintains that other prophets, including Book of Mormon prophets, received structured passages from God in the same way. H. Clay Gorton and Charles Francis King adopt a similar philosophy.<sup>13</sup>

Loftes Tryk agrees that Joseph Smith did not know about chiasmus, praises the sophistication and elegance of the chiastic structure in the Book of Mormon, and ascribes this structure to Satan.<sup>14</sup>

supplemental material 2

Evidently, what some deem to be instances of intentional chiasmus, others dismiss as arrangements of words that fall into unintentional chiastic order by chance. In an effort to standardize the discussion, Welch published in 1988 fifteen criteria to aid the analyst in assessing the likelihood that the chiastic structure of a passage in any body of literature was created intentionally by its author.<sup>15</sup> Some of these factors are objectivity (the strength of

the associations between the paired elements), boundaries (the extent to which the passage operates as a well-defined literary unit within the context of the larger work from which it was taken), and centrality (the importance of the focal point of the chiasm). Four of his other criteria can be quantified numerically, namely: length (number of chiastic elements), density (the fraction of the passage that is devoted to chiastic elements), mavericks (the number of extra appearances of chiastic elements, such as the italicized appearances of “name” and “call” in Mosiah 5:10–12, Example 2), and reduplication (the extent of repetition of nonchiastic elements). Here, a “nonchiastic element” is a literary element that appears at least twice but does not participate in the chiastic structure, such as the word “hearts” in Mosiah 5:10–12.

### A Mathematical Approach

In this study, we develop additional quantitative tools for calculating the likelihood that the chiastic structure of a passage of text could have emerged by chance. From this statistical analysis, one can infer, in some cases, that chiastic structure was likely created intentionally by its author, that is, by design. We distill Welch’s four quantitative criteria into a single quantity  $L$ , the “reordering” likelihood that  $n$ -element chiastic structure could have appeared by chance *in a particular passage*, such as Mosiah 5:10–12 (Example 2). We also calculate the chiastic probability,  $P$ , that such structure could have appeared by chance *anywhere in the larger work* from which the passage was taken, such as the Book of Mormon in the case of Mosiah 5:10–12.

The longer the work from which a chiastic passage is taken, the greater the number of words that could potentially form unintentional chiastic structure and the greater the likelihood  $P$  that such structure could have appeared by chance *somewhere* in this work; the longer a monkey sits at a typewriter, the greater the likelihood that a sonnet will emerge. In order to calculate  $P$ , we must therefore estimate the number  $N$  of *opportunities* for chiastic structure in the larger work, and the number  $M$  of such opportunities that are actually chiastic. The greater the number  $N$  of opportunities for structure, the greater the likelihood that one of these would happen to have chiastic structure.<sup>16</sup>

As an illustration of how this is done, we consider Matt. 10:35–39 as the “larger work,” and Matt. 10:39 (Example 1) as the particular chiastic passage found within it. This chiastic passage has no extra repetition and has two elements, hence in this case  $n = 2$ . Our goal is to determine the

likelihood  $P$  that such structure would emerge by chance somewhere in Matt. 10:35–39:

**EXAMPLE 5**

For I am come to set a man at variance against his father,  
 and the **daughter** (a) against her **mother** (b),  
 and the **daughter** (a') in law against her **mother** (b') in law.  
 And a man's foes shall be they of his own household.  
**He that loveth** (c) father or mother **more than me is not worthy of me** (d):  
 and **he that loveth** (c') son or daughter **more than me is not worthy of me** (d').  
 And he that taketh not his cross, and followeth after me, is not worthy of me.  
 He that **findeth his life** (e) shall **lose it** (f):  
 and he that **loseth his life** (f') for my sake shall **find it** (e').

To determine the number ( $N$ ) of opportunities for two-element chiastic structure in this example, we read through the example from the beginning, noting the appearances of all significant literary elements (defined below). As soon as some element appears for a *second* time (“daughter,” in this case), it has the potential to participate in the chiastic structure, and its first and second appearances are designated by a and a'. We then continue through the passage until a *second* element (“mother”) appears for the *second* time, and designate its appearances as b and b' (see labeling of lines 2 and 3 of Example 5). These two pairs of appearances together constitute a single opportunity for two-element chiastic structures. We then continue looking for other opportunities for two-element structures through the end of the example. In this manner, we identify  $N = 3$  opportunities for two-element chiastic structures, because three matching pairs (a-b, c-d, e-f) are present in the passage. The first two of these opportunities are not chiastic, having the form aba'b' or cdc'd', whereas the third (Example 1) is chiastic, having the form eff'e'. Thus  $M = 1$  for this example because only one of the  $N = 3$  opportunities is chiastic. Were the elements within each of these opportunities to be rearranged at random, any of the three might have produced a chiasm with two elements and no extra repetition. The presence of three opportunities increases the likelihood that chiastic structure would emerge by chance *somewhere* in the larger work, in the same way that flipping a coin three times increases the likelihood that at least one coin toss will give “heads.”

[supplemental material 3](#)

The value of  $P$  for a passage is the likelihood that its chiastic structure would emerge by chance from random rearrangements of the literary elements in the larger work from which it was taken. A small value of  $P$  near

zero supports the notion that the structure appeared by design, that is, by deliberate application of the chiasmic form.<sup>17</sup> A moderate value near  $P = 0.5$  indicates that approximately 50 percent of random rearrangements would yield chiasmic structure, whereas a large value of  $P$  near to 1.0 indicates that most such rearrangements would yield chiasmic structure. Though a moderate or a large value of  $P$  for a passage implies that its chiasmic structure could easily be replicated by random rearrangements, this does *not* imply that chiasmic structure is likely to have been unintentional on the part of the author. Moderate and large values of  $P$  say absolutely nothing about intentionality. The author of a passage with a moderate or large value of  $P$  may well have intentionally invoked the chiasmic form in composing the passage, but such a value simply provides no evidence that she did, nor does it provide evidence that she did not. In such cases, one may resort to Welch's remaining criteria to assess the likelihood of unintentional chiasmic structure.<sup>18</sup> On the other hand, passages with small values of  $P$  have small likelihoods of emerging by chance and are therefore likely to have appeared by design.

Yehuda Radday included some statistical analysis in his extensive studies of biblical chiasms.<sup>19</sup> His analysis (1) excludes extra appearances of chiasmic elements (such as the italicized appearances of "name" and "call" in Mosiah 5:10–12, Example 2) by assuming that each element appears exactly twice in a passage, (2) excludes unbalanced orderings (such as aabb and bbaa in the discussion of Example 5) by constraining each element to appear once in the first half and once in the second half of the chiasm and (3) ignores the increase in the chiasmic likelihood due to multiple opportunities for chiasmic structure within the larger work (see Example 5). Our analysis takes each of these factors into account.

Daniel Vogel allows for the possibility that complex chiasms might occasionally appear in the Book of Mormon, but he argues that "the multitude of near-misses points to what statisticians call the fallacy of the enumeration of favorable circumstances, or emphasizing the successes while disregarding the failures."<sup>20</sup> Our analysis accounts for such failures by including an estimate of the total number of opportunities for chiasmic structure in the Book of Mormon, not just the successful ones, and therefore allows for reliable estimates of the likelihood that chiasms appeared in the Book of Mormon—and in other books—by chance. Our analysis also accounts for such failures on a different level, by accounting for nonchiasmic elements within each chiasm (such as the word "hearts" in Mosiah 5:10–12), which *might* have participated in the chiasmic structure but did not.

**TABLE 1**  
**Likelihoods  $P$  that Chiasms in Various Works Could Have Appeared by Chance**

Work	Chiasm	Example	$n$	$L$	$N$	$M$	$P$
1. Book of Abraham	3:26–28	7	3	0.067	54	1	0.98
2. Matt. 10:35–39	Matt. 10:39	5	2	0.33	3	1	0.70
3. <i>INFORMIX Guide</i>	Introduction	4	9	0.66	1	1	0.66
4. Doctrine and Cov.	88:34–39	3	5	0.0011	686	1	0.52
5. Book of Mormon	four strongest	2,8,9,11	5	0.0011	956	4	0.020
6. Pentateuch	Lev. 24:13–23	10	7	0.0000074	342	1	0.0025
7. Book of Mormon	Alma 36:1–30	11	8	0.00000049	359	1	0.00018

### Summary of Mathematical Results

Our calculations, explained further below, shed light on the significance of chiasmus in the Book of Mormon. To evaluate this significance, we identified the strongest chiasms known to us that appear in the Book of Mormon, the Doctrine and Covenants, and other works. These chiasms are pertinent to assessing the likelihood that chiasmus appeared in these works by chance. We computed  $P$  for each of these strongest candidates. Our results are displayed in Table 1 in order of decreasing values of  $P$ , with results for the strongest chiasms in the Book of Abraham, the Doctrine and Covenants, the Pentateuch, and the Book of Mormon listed respectively on lines 1, 4, 6, and 7 of this table. Although other results in this table rely on computer simulations, the results for  $L$  and  $P$  on these four lines follow directly from explicit mathematical equations (Equations 1 and 2, see below) using a hand calculator and do not require the services of a computer, except to use a word processor to search for instances of literary elements within various text passages. Thus, our principal results and conclusions do not rely on computer calculations.

These results establish a high likelihood that the chiastic structure of Leviticus 24:13–23<sup>21</sup> appeared in the Pentateuch by design and that the chiastic structure of Alma 36:1–30 appeared in the Book of Mormon by design. These results rule out, with 99.98 percent certainty, the claim that Alma 36:1–30 is simply an arrangement of words that happen to fall into chiastic order by chance. The small upper bound  $P = 0.020$  on the likelihood that four of the strongest chiasms in the Book of Mormon, Mosiah 3:18–19,<sup>22</sup> Mosiah 5:10–12,<sup>23</sup> Alma 36:1–30,<sup>24</sup> and Helaman 9:6–11,<sup>25</sup> could have appeared by chance further confirms the intentionality of chiasmus in the

Book of Mormon. Our results do not prove that the Book of Mormon is a translation of an ancient document, but they do establish that chiastic passages in the Book of Mormon likely appeared by design, that is, by the deliberate application of the chiastic form by the author(s) of these passages.

The results shown in Table 1 indicate that the strongest chiastic structure in the Doctrine and Covenants, the Book of Abraham, and the *INFORMIX Guide* could easily have emerged from random rearrangements of their literary elements. Our results do not support the claim that chiasms appeared by design—be it Joseph Smith’s, God’s, or Satan’s—in the Doctrine and Covenants or in the Book of Abraham. Neither do our results rule out this claim, since the corresponding values of  $P$  provide no evidence either way. Our results are consistent with the idea that chiasms in the Doctrine and Covenants and the Book of Abraham are simply patterns of words that happen to fall into chiastic order by chance, patterns that are recognized only after the fact through the diligence of the analyst. Our results do not rule out the possibility that Joseph Smith knew about the chiastic style when he translated the Book of Mormon but do rule out the use of chiasms in the Doctrine and Covenants and the Book of Abraham as possible evidence of that knowledge.

The tools developed for this study help analysts to make quantitative judgments regarding the intentionality of chiasmus. These judgments are based only on the order of words and ideas and disregard the overall integrity and literary merit of chiasms. Accordingly, our tools may add to, but not replace, Welch’s nonquantitative criteria and other indices of chiastic strength.<sup>26</sup>

In the remaining sections of this article, we state and justify the criteria we have used for the selection of literary elements and chiastic boundaries; we then show how we arrived at an exact equation for  $P$ ; we next introduce an exact equation for  $L$  in cases of “simple” chiasms, such as Matthew 10:39 (Example 1) and Doctrine and Covenants 88:34–39 (Example 3), which involve no nonchiastic elements and involve exactly two appearances of each chiastic element, and we describe our *Monte Carlo* simulations for “complex” chiasms, such as Mosiah 5:10–12 (Example 2) and *INFORMIX* (Example 4), which fail to qualify as simple. Following our application of these tools to obtain the values reported in Table 1, we discuss the results shown in Table 1 and then draw conclusions.

### **Selection of Literary Elements and Chiastic Boundaries**

The first steps in assessing the chiastic likelihood  $P$  for a particular passage are (1) to choose the starting and ending points, or “boundaries,” of

the passage; (2) to identify all of the literary elements that appear at least twice between these boundaries (elements appearing only once do not affect the statistical results); and (3) to determine which of these elements form part of the chiasmic structure. This process requires judgment calls about which words or word combinations are significant enough to be identified as literary elements and which pairs of literary elements are associated strongly enough to be considered different appearances of the same literary element. Since valid statistical results depend crucially on the care with which this is done, we have adopted a set of strict selection rules to guide this process:

*Rule 1: Chiasmic boundaries must be located at the ends of sentences or significant phrases.* This is a form of Welch's "boundaries" criterion<sup>27</sup> and precludes contrived boundaries that are chosen to maximize the number of chiasmic elements without regard to interruptions of grammatical structure.

*Rule 2: Two or more appearances of a single literary element must share the same essential word or words.* Different tenses (receive, received), pluralities (receive, receives), negatives (receive, not receive), and speech forms (receive, receipt) of a word are allowed, but synonyms (receive, accept) are not. This rule promotes strong associations between the paired elements in a chiasmic structure, is a strict form of Welch's "objectivity" criterion,<sup>28</sup> and corresponds approximately to a class of chiasms called "antimetabole" by Vogel, which restate, in the second half, the exact words or identical ideas of the first half, in reverse order.<sup>29</sup> Because the human mind can find a logical tie between almost any two ideas, many proposed chiasmic structures include weak associations that cast doubt upon the validity of statistical analysis. We adopt this rule to preclude such weak associations, acknowledging that the rule also precludes some strong synonymous associations (see Isaiah 60:1–3<sup>30</sup>), in order to set a strict and easily enforced standard that is consistent with the tools developed in this paper. For our statistical purposes, we firmly reject the suggestion that strong overall chiasmic structure justifies the inclusion of a few weakly associated chiasmic pairs within that structure.<sup>31</sup>

*Rule 3: The significance of an element is judged against the significance of the other elements in the same passage.* Insignificant words such as "the" are excluded as literary elements. We favor significant ideas or phrases, such as elements c, d, and f in Mosiah 5:10–12 (Example 2), as literary elements but employ individual words, such as elements a, b, and g, if ideas or phrases cannot be identified. This rule acknowledges that a repeated phrase or idea represents a stronger association than a repeated word.

*Rule 4: Inclusion of more than one word or idea in a chiastic section and its twin are permitted, as are multiple appearances of such elements within sections.* For example, see the multiple appearances of “law” and “abide” in sections a and a’ in Doctrine and Covenants 88:34–39 (Example 3) above. Nonchiastic elements are allowed to appear more than once within a single chiastic section, as long as they do not appear outside this section. For example, in Doctrine and Covenants 88:34–39, the word “sin” appears twice within section a, and the word “conditions” appears twice within section a’. We do not designate these words as nonchiastic elements because they make no appearances outside of these sections.

*Rule 5: Extra appearances of chiastic elements must be accounted for in the analysis.* “Extra appearances” of an element means appearances of that element outside of its proper places in the chiastic structure. (See, for example, the italicized extra appearances of “name” in Mosiah 5:10–12, Example 2.) If a chiastic element is a single word, then extra appearances of that word must be accounted for in the analysis. If a literary element is a phrase or an idea, then we do not account for extra appearances of individual words used in this phrase or idea but do account for extra appearances of the entire phrase or idea. As will be seen, accounting properly for such extra appearances in chiasms with considerable extra repetition, such as the INFORMIX example (Example 4), often leads to the conclusion that their chiastic structure could easily have resulted by chance. On the other hand, failing to account for such extra repetition by considering only those appearances that fit into the chiastic structure and by ignoring all others can lead mistakenly to the opposite conclusion.

*Rule 6: Nonchiastic elements must be accounted for in the analysis.* The smallest building blocks (words, phrases, or ideas) that are used to define the chiastic structure itself must be applied consistently in identifying and accounting for “nonchiastic” elements that appear at least twice in the passage but do not participate in its chiastic structure. If at least one of the chiastic elements in a passage is a single word, then other significant single words that are not part of the chiastic structure must be accounted for. For example, since Mosiah 5:10–12 (Example 2) employs both single words (“name”) and phrases (“I would that ye should remember”) as chiastic building blocks, we also identify and account for other single words (such as “hearts”) that appear at least twice in the passage but do not participate in its chiastic structure. In a similar way, if the smallest chiastic building block is a phrase or an idea, then other phrases or ideas that appear at least twice in the passage but do not participate in its chiastic structure are identified and accounted for as nonchiastic elements.

We do not suggest that these rules exhaustively define what can or cannot be called a chiasm. We simply adopt them as enforceable standards consistent with the statistical tools developed in this paper, to be applied uniformly to all chiasms considered herein. Many chiasms proposed in the literature must be modified to conform fully to these rules so that we can evaluate, in a manner that allows consistent comparisons between chiasms, the likelihood that such chiasms could have appeared by chance.

[supplemental material](#) □  
[Appendix K](#)

For the chiasms considered herein, boundaries and literary elements have been selected by hand rather than by computer, except that we have used the word search feature of a word processor to identify all appearances of all literary elements.

### Calculation of the Chiastic Likelihood $P$

In this section, we develop an equation for  $P$  that is valid when the chiastic structure of interest appears only once in the larger work from which it was taken—that is, when  $M = 1$ . This equation applies only to the chiasm with the smallest value of  $L$  in a work and only if there are no other chiasms with comparable values of  $L$  in the work. The equation holds for all but one listing in Table 1 (Line 5), which will be treated separately below. If  $L$  is the likelihood that chiastic structure would emerge by chance in one opportunity, then  $1 - L$  is the likelihood that such structure would *not* emerge in that opportunity, and  $(1 - L)^N$  is the likelihood that *none* of the  $N$  opportunities would have such structure. Finally,

#### EQUATION 1

$$P = 1 - (1 - L)^N$$

follows as the likelihood that *at least one* of the  $N$  opportunities would have this structure.

Most of the effort required to evaluate  $P$ , and most of the discussion that follows, will be devoted to finding  $L$  and  $N$ , since  $P$  follows immediately from  $L$  and  $N$  using Equation 1.

### Reordering Likelihood $L$ for Simple Chiasms

It is straightforward to calculate the reordering likelihood  $L$  for simple chiasms, for which each of  $n$  independent literary elements in a passage appears exactly twice in the passage and contributes to its chiastic structure; simple chiasms have no nonchiastic elements or extra

appearances of chiasmic elements. The likelihood that such structure will emerge by chance is

**EQUATION 2**  

$$L = 1 / (2n - 1)!!$$

where  $(2n - 1)!! = 1 \cdot 3 \cdot 5 \dots (2n - 1)$  is a product of  $n$  odd integers called “ $2n - 1$  double factorial.” If  $n = 2$ , then  $(2n - 1)!! = (2 \cdot 2 - 1)!! = 3!! = 1 \cdot 3 = 3$ , and  $L = 1/3 = 0.33$ . (For a derivation of this equation, see Appendix B online at <http://byustudies.byu.edu/chiasmus>.) This is the value obtained in Example 5. If  $n = 3$ , then  $(2n - 1)!! = (2 \cdot 3 - 1)!! = 5!! = 1 \cdot 3 \cdot 5 = 15$ , and  $L = 1/15 = 0.067$ . As can be seen from Table 2,  $L$  becomes tiny for large  $n$ , indicating that only a tiny fraction of random orderings will be chiasmic when the number of elements in a simple chiasm is large.

supplemental material □  
 Appendix B

**TABLE 2**  
**L Values for Simple Chiasms**

$n$	$(2n - 1)!!$	$L = 1 / (2n - 1)!!$
1	1	1.00
2	1·3	0.33
3	1·3·5	0.067
4	1·3·5·7	0.0095
5	1·3·5·7·9	0.0011
6	1·3·5·7·9·11	0.000096
7	1·3·5·7·9·11·13	0.0000074
8	1·3·5·7·9·11·13·15	0.00000049
9	1·3·5·7·9·11·13·15·17	0.000000029
10	1·3·5·7·9·11·13·15·17·19	0.0000000015

### Reordering Likelihood $L$ for Complex Chiasms

Many chiasms, including Mosiah 5:10–12 (Example 2), do not qualify as simple chiasms because they involve nonchiasmic elements and/or extra appearances of chiasmic elements. Consequently, for these chiasms, Equation 2 cannot be used to determine  $L$ , and we instead resort to a *Monte Carlo* technique,<sup>32</sup> which uses a computer to generate random arrangements of the orders of the appearances of elements, as if they were drawn from a hat.

[supplemental material 4](#)

Whereas  $L$  is known exactly for simple chiasms, *Monte Carlo* estimates of  $L$  are not exact. For the result  $L = 2/3 = 0.67$  above, the margin of error is plus or minus  $\sqrt{2}/3 = 0.47$ , which is the ratio of the square root of the numerator of  $L$  to its denominator. This margin of error means that the estimate  $L = 0.67 \pm 0.47$  will include the exact value, whatever that is, 68 percent of the time. The larger the number of random rearrangements, the smaller the margin of error and the more accurate the estimate of the exact value, in the same way that public opinion polls involving larger numbers of people yield more accurate results. The computer program that we wrote to carry out these *Monte Carlo* simulations, which is available for free download,<sup>33</sup> has been validated by comparing with exact results. For a simple chiasm with  $n = 5$ , a simulation involving ten million random orderings gives  $L = 0.00105 \pm 0.00001$ , which agrees with the exact result  $L = 1/945 = 0.00106$  from Table 2.

[supplemental material 5](#)[supplemental material 6](#)

Some chiasms in the literature, such as Matthew 13:13–18, employ a single chiastic element at two different levels in the chiastic structure. For example, consider:

**EXAMPLE 6**

- (a) A **boy**
- (b) saw a **dog**,
- (c) who followed the **boy**.
- (c') The **boy**
- (b') fed the **dog**.
- (a') The **boy** was happy.

This chiasm is not simple because levels (a) and (c) involve the same element, “boy,” and because simple chiasms require independent elements at each level. Accordingly, the value  $L = 0.067$  for a simple three-element chiasm (Table 2) underestimates the actual likelihood of this structure appearing by chance. The correct likelihood  $L = 0.20$  may be obtained by *Monte Carlo* simulation with 10,000 random orderings, by demanding one duplicate level (level c) in the chiastic structure.

For closely related elements used at different levels of a chiasm to be considered as independent, there must be a clear point of distinction. For example, elements b, c, and e in Doctrine and Covenants 88:34–39 (Example 3) share some of the same words, but each element is a distinct combination of these words.

## Applications

We now explain how we applied the tools developed above to investigate the likelihood of the appearance of chiasmic structure by chance for the examples listed in Table 1 (page 110 above).

**Line 1. Book of Abraham.** In order to assess the significance of chiasmus in the Book of Abraham, we examined all of the chiasms in the book that have been proposed by Peterson, Ostler, and Metcalfe and have calculated  $L$  for those involving at least three chiasmic elements that satisfy Rule 2.<sup>34</sup> The strongest of these is Abraham 3:26–28, a simple three-element chiasm with  $L = 0.067$  (Table 2) and the only one of its kind in the book ( $M = 1$ ):

[supplemental material](#)  
[Appendix C](#)

### EXAMPLE 7

- (a) And **they who keep their first estate** shall be added upon; and **they who keep not their first estate** shall not have glory in the same kingdom with **those who keep their first estate**; and they who keep their second estate shall have glory added upon their heads for ever and ever.
- (b) **And the Lord said; Whom shall I send?**
- (c) And one answered like unto the Son of Man: **Here am I, send me.**
- (c') And another answered and said: **Here am I, send me.**
- (b') **And the Lord said: I will send** the first.
- (a') And the second was angry, and **kept not his first estate**; and, at that day, many followed after him.

We estimate the number of opportunities for simple three-element chiasmic structure to be  $N = 54$  in the Book of Abraham.<sup>35</sup> Inserting these values for  $L$  and  $N$  into Equation 1 yields  $P = 0.98$ . This high likelihood makes it statistically indefensible to argue that simple three-element chiasmic structure appeared by design in the Book of Abraham.

[supplemental material](#)  
[Appendix D](#)

**Line 3. INFORMIX-OnLine Database Administrator's Guide Introduction.** The *INFORMIX* example (Example 4) has nine chiasmic elements: applications (appearing 6x), OnLine (8x), processes (6x), information (3x), access (5x), database (7x), client (9x), program (3x), and request (5x) and two nonchiasmic elements: server (2x) and data (3x). A *Monte Carlo* simulation involving ten thousand random orderings of these elements gives  $L = 0.66 \pm 0.01$  for this nine-element chiasmic structure. This value greatly exceeds the value  $L = 0.00000029$  (Table 2) for a simple nine-element chiasm, indicating that the extra appearances of chiasmic elements and the appearances of nonchiasmic elements make what might have been a very impressive chiasm into something that could easily have appeared by chance.

We do not have access to the larger work from which Example 4 was taken and accordingly treat it as if it were the entire work, so that  $N = 1$ . According to Equation 1, the likelihood that nine-element chiastic structure would result by chance in this work is  $P = L = 0.66 \pm 0.01$ . This value does not rule out the possibility that this chiastic structure appeared by design, neither does it establish this as being likely. This value is consistent with the notion that authors of computer manuals do not normally employ poetic forms deliberately. This consistency helps to confirm our analytical tools—a small value of  $P$  might have indicated some flaw in these tools.

**Line 4. Doctrine and Covenants.** In order to assess the significance of chiasmus in the Doctrine and Covenants, we examined all of the chiasms in the book that have been proposed by Shipp, Ostler, Gorton, Metcalfe, and King and have calculated  $L$  for those involving at least five chiastic elements satisfying Rule 2.<sup>36</sup> The strongest of these is Doctrine and Covenants 88:35–39 (Example 3), a simple five-element chiasm with  $L = 0.0011$  (Table 2) and the only one of its kind in the book ( $M = 1$ ). We do not suggest that Doctrine and Covenants 88:35–39 is the most important chiasm in the Doctrine and Covenants but simply report that it has the smallest likelihood of appearing by chance of all the chiasms that we have analyzed in this book. Using this value of  $L$  and the estimated number  $N = 686$  of opportunities for five-element chiastic structure in the Doctrine and Covenants,<sup>37</sup> we use Equation 1 to determine the likelihood  $P = 0.52$  that the simple five-element structure of Doctrine and Covenants 88:35–39 could have appeared by chance anywhere in the Doctrine and Covenants. This value of  $P$  indicates that such structure could easily result by chance and does not support the notion that such structure emerged by design. Although the specific value of  $P$  will vary somewhat with the estimate of  $N$ , our basic conclusion about the Doctrine and Covenants would not change even for  $N$  as small as 50.

**Line 5. Book of Mormon.** In order to assess the significance of chiasmus in the Book of Mormon, we examined all of the chiasms in the book that have been proposed by Welch and Parry and have calculated  $L$  for those involving at least five chiastic elements satisfying Rule 2.<sup>38</sup> The strongest four of these chiasms, Mosiah 3:18–20, Mosiah 5:10–12, Alma 36:1–30, and Helaman 9:6–11, have values of  $L$  that are less than or equal to  $L = 0.0011$  for a simple five-element chiasm.

Mosiah 3:18–19 is a simple five-element chiasm with  $L = 0.0011$ :

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[Appendix E](#)

[supplemental material](#) □  
[Appendix F](#)

[supplemental material](#) □  
[Appendix G](#)

**EXAMPLE 8**

- (Men will drink damnation to their souls unless)
- (a) they **humble** themselves
  - (b) and **become as little children,**
  - (c) believing and believe that **salvation was, and is, and is to come, in and through is in the atoning blood of Christ,** the Lord Omnipotent.
  - (d) For the **natural man** is an enemy to God,
  - (e) and **has been** from the fall of Adam,
  - (e') and **will be,** forever and ever,
  - (d') unless he yieldeth yields to the enticings of the Holy Spirit, and putteth off the **natural man**
  - (c') and becometh a **saint through the atonement of Christ** the Lord,
  - (b') and **becometh as a child,**
  - (a') submissive, meek, and **humble** . . .

Mosiah 5:10–12 (Example 2)<sup>39</sup> is a complex seven-element chiasm with a value  $L = 0.00078 \pm 0.00001$  (obtained by *Monte Carlo* simulation with ten million random orderings) that is only slightly smaller than  $L = 0.0011$  because Mosiah 5:10–12 involves extra appearances of chiastic elements as well as appearances of nonchiastic elements.

Helaman 6:9–11<sup>40</sup> is a simple six-element chiasm with the smaller value  $L = 0.000096$ :

**EXAMPLE 9**

- (a) And it came to pass that **they became exceedingly rich,** both the Lamanites and the Nephites;
- (b) and they did have an **exceeding plenty of gold, and of silver, and of all manner of precious metals, both in the land south and in the land north.**
- (c) Now the **land south**
- (d) was called **Lehi,**
- (e) and the **land north**
- (f) was called **Mulek,** which was after the son of Zedekiah;
- (f') for the Lord did bring **Mulek**
- (e') into the **land north,**
- (d') and **Lehi**
- (c') into the **land south.**
- (b') And behold, there was **all manner of gold in both these lands, and of silver, and of precious ore of every kind;** and there were also curious workmen, who did work all kinds of **ore** and did refine it;
- (a') and thus **they did become rich.**

Alma 36:1–30 qualifies as a simple eight-element chiasm with  $L = 0.00000049$ , as shown in the discussion of Line 7 below.

Each of the four strongest chiasms in the Book of Mormon has a value of  $L$  that is less than or equal to  $L = 0.0011$  for a simple five-element chiasm

and is therefore at least as strong as a simple five-element chiasm. This observation allows us to calculate an upper bound on the likelihood that these four chiasms could have appeared in the Book of Mormon by chance. Approximately  $N = 956$  opportunities for simple five-element structure exist in the Book of Mormon.<sup>41</sup> The likelihood that at least  $M = 4$  simple five-element chiasms would emerge by chance in these 956 tries is  $P = 0.020$ , obtained by generalizing Equation 1.<sup>42</sup> Had each of the four strongest chiasms in the Book of Mormon been a simple five-element chiasm, then  $P = 0.020$  would have represented the likelihood that these four could have appeared in the book by chance. Since three of the four are stronger than simple five-element chiasms, the actual likelihood that these four could have appeared in the Book of Mormon by chance is much smaller than  $P = 0.020$ . This result establishes firmly that the four strongest chiasms in the Book of Mormon are unlikely to have appeared in it by chance.

**Line 6. Bible—Pentateuch.** Most agree that Hebrew biblical writers occasionally employed chiastic structure deliberately in their writing. Finding small  $P$  values for chiastic passages in the Bible would confirm this. Of the biblical examples that we have analyzed, which include Ezekiel 34:2–16<sup>43</sup> and Philemon,<sup>44</sup> the strongest is the celebrated “blasphemer” chiasm,<sup>45</sup> Leviticus 24:13–23:

**EXAMPLE 10**

- (a) And the **LORD spake unto Moses**, saying,
- (b) **Bring forth him that hath cursed without the camp**; and let all that heard him lay their hands upon his head, and let all the congregation **stone him**.
- (c) And **thou shalt speak unto the children of Israel**, saying,
- (d) Whosoever acurseth his God shall bear his sin. And he that blasphemeth the name of the LORD, he shall surely be put to death, and all the congregation shall certainly stone him: **as well the stranger, as he that is born in the land**, when he blasphemeth the name of the LORD, shall be put to death.
- (e) And **he that killeth any man shall surely be put to death**.
- (f) **And he that killeth a beast shall make it good; beast for beast**.
- (g) **And if a man cause a blemish in his neighbour; as he hath done, so shall it be done to him**; Breach for breach, eye for eye, tooth for tooth:
- (g') **as he hath caused a blemish in a man, so shall it be done to him again**.
- (f') **And he that killeth a beast, he shall restore it**:
- (e') **and he that killeth a man, he shall be put to death**.
- (d') Ye shall have one manner of law, **as well for the stranger, as for one of your own country**: for I am the LORD your God.

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[Appendix I](#)

[supplemental material](#) □  
[Appendix A](#)

- (c') **And Moses spake to the children of Israel,**
- (b') that they should **bring forth him that had cursed out of the camp, and stone him with stones.**
- (a') And the children of Israel did as the **LORD commanded Moses.**

This chiasm involves seven paired ideas and no pairings of single words. Accordingly, pursuant to Rules 5 and 6, the search for nonchiastic elements and extra appearances of chiastic elements is limited to ideas rather than individual words. Since this search bears no fruit, the chiasm is simple and has  $L = 0.000074$  from Table 2. We estimate the number of opportunities for simple seven-element structure in the Pentateuch, the five books of Moses comprising the first five books in the Old Testament, to be  $N = 342$ .<sup>46</sup> Inserting these values into Equation 1 gives the small likelihood  $P = 0.0025$  that seven-element chiastic structure appeared by chance in the Pentateuch.

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[Appendix J](#)

**Line 7. Book of Mormon.** Alma 36:1–30 covers an entire chapter. Various proposed structures for this chiasm<sup>47</sup> agree on the boundaries (the beginning and end of the chapter) and the focal point (the cry for mercy to Jesus Christ in v. 18) but differ in the number of chiastic elements, which varies from 11 to 17. To some, this lack of consensus indicates that the author of this chapter (be it Alma, Joseph Smith, God, Satan, or someone else) took some liberty with the chiastic form. To others, this lack of consensus indicates that any chiastic structure stems from the ingenuity of the analyst, not the author, and likely resulted by chance.<sup>48</sup>

We calculated the likelihood that the Alma 36 chiasm appeared in the Book of Mormon by chance for two different renderings of its structure in order to assess the robustness of our conclusions. Short summaries of these renderings are presented here; their full text is available online at <http://byustudies.byu.edu/chiasmus>. The first is a simple chiasm with eight chiastic elements, appearing first in the following order and then repeated in reverse order:

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[Appendix L](#)

**EXAMPLE 11**

- (a) Inasmuch as ye shall keep the commandments of God ye shall prosper in the land. [1, 30]
- (b) Ye should do as I have done, in remembering the captivity of our fathers. [2, 29]
- (c) God delivered our fathers from bondage. [2, 28–29]
- (d) Those who trust God will be supported in their trials and lifted up at the last day. [3, 27–28]
- (e) I (and others) received knowledge of God, and were born of God. [4–5, 23–26]

- (f) I fell (stood) and lost (regained) the use of my limbs. [6–11, 23]
- (g) I feared (longed) to be with God and was harrowed up by the memory of my sins (no more). [12–17, 19–22]
- (h) I remembered (appealed to) Jesus Christ, son of God. [17, 18]

Here, numbers in square brackets refer to verse numbers in Alma 36. The second rendering is a complex chiasm with ten elements:

- (A) Inasmuch as ye shall keep the commandments of God ye shall prosper in the land. [1, 30]
- (B) Ye should do as I have done, in remembering the captivity of our fathers. [2, 29]
- (C) God delivered our fathers from bondage. [2, 28–29]
- (D) Those who trust God will be supported in their trials and lifted up at the last day. [3, 27–28]
- (E) I received knowledge of God. [4, 5, 26]
- (F) I (and others ) were born of God. [5, 23–26]
- (G) I fell (stood) and lost (regained) the use of my limbs. [6–11, 23]
- (H) I feared (longed) to be with God. [14–15, 22]
- (I) I was harrowed up by the memory of my sins (no more). [12–14, 16–17, 19–21]
- (J) I remembered (appealed to) Jesus Christ, son of God. [17–18]

This ten-element structure is a close cousin of eleven-element structures displayed in full text by Welch, Parry, and others.<sup>49</sup> We excluded Welch’s first element, “word(s).” This is the only chiastic element of his eleven that consists of a single word rather than a complete idea. Including this element would, by Rules 5 and 6, require us to account for single words that appear at least twice anywhere in the chiasm because it is statistically inconsistent to include a single word in the chiastic structure without also accounting for extra appearances of this and other single words throughout the work, including those words that do not participate in this structure. Excluding Welch’s first element accordingly allowed us to confine our attention to complete ideas as the building blocks of chiastic structure.

The eight-element structure has the advantage of confining all appearances of chiastic elements strictly to their chiastic sections—there are no extra appearances. For example, all of the appearances of being “harrowed up by the memory of my sins” are confined to sections g and g’. Furthermore, there are no nonchiastic elements, because other significant ideas are confined to particular chiastic sections (such as the confinement of “seeking to destroy the church of God” to section f), according to Rule 4.

As an eight-element chiasm (Example 11), Alma 36 yielded  $L = 0.00000049$ , which qualifies it as the strongest of the four strongest chiasms in the Book of Mormon. Applying Equation 1 with this value of  $L$  and the estimate  $N = 359$  of the number of opportunities for simple eight-element structure in the Book of Mormon gives  $P = 0.00018$ .<sup>50</sup> This very low likelihood leads us to conclude that the chiastic structure of Alma 36 likely appeared in the Book of Mormon by design. Although the specific value  $P = 0.00018$  would likely change if more refined estimates of  $N$  were made, our basic conclusion would not, even for values of  $N$  as large as 100,000, which is approximately ten times the actual number of verses in the Book of Mormon.

The ten-element arrangement of Alma 36 lacks any nonchiastic elements but does involve one extra appearance each of elements E (in verse 5) and I (in verses 12–14). A *Monte Carlo* simulation involving 400,000,000 random orderings resulted in only three orderings with ten-element chiastic structure, which yields  $L = 0.000000008 \pm 0.000000004$ . Using  $N = 359$  as before, we obtain  $P = 0.0000027 \pm 0.0000016$ , which is much lower than the value obtained for the more conservative eight-element structure. Accordingly, analysis of the ten-element structure strongly confirms the conclusion reached with the eight-element structure, that the likelihood is very high that the chiastic structure of Alma 36 appeared in the Book of Mormon by design.

## Conclusions

Table 1 (page 110 above) summarizes our results for the statistical likelihood  $P$  that chiasmus appearing in various literary works could have appeared by chance. Based on these estimates, we conclude that the likelihood is high that chiastic structure appeared by design in the Pentateuch and in the Book of Mormon. Our estimates do not support such a conclusion for the Doctrine and Covenants, the Book of Abraham, and the *INFORMIX Guide* Introduction, indicating instead that chiasms could have appeared in these works by chance. This conclusion might be altered by the discovery of simple chiasms with larger numbers of elements in these works but is unlikely to be altered by more refined estimates of  $N$ .

**Line 7.** Our small value  $P = 0.00018$  for the strongest chiasm in the Book of Mormon, Alma 36, establishes with 99.98 percent certainty that this chiasm appeared in this book by design and rules out the hypothesis<sup>51</sup> that it appeared by chance. Who the designer might be—Joseph Smith or another modern author with preknowledge of chiasmus, God, Satan,

or ancient authors with connections to the old world—cannot be determined using our statistical analysis. The value  $P = 0.00018$  implies that only one instance of eight-element chiastic structure comparable to Alma 36 would be found, on average, in 5,000 random rearrangements of the literary elements in all 359 estimated opportunities for such structure in the Book of Mormon.

**Line 6.** Our small value  $P = 0.0025$  for the strongest chiasm in the Pentateuch, Leviticus 24:13–23, establishes with 99.75 percent certainty that this chiasm appeared by design in the Pentateuch. This result is consistent with the general belief that Hebrew biblical writers sometimes chose to express themselves using chiasmus.

**Line 4.** Our moderate value  $P = 0.52$  for the strongest chiasm in the Doctrine and Covenants, Doctrine and Covenants 88:34–39, does not rule out the appearance of chiasmus in this book by design nor does it establish this as being likely. This value implies that about half of random rearrangements of the literary elements in all 91 estimated opportunities in the book would yield at least one simple five-element chiasm. Accordingly, this value renders the suggestion<sup>52</sup> that Joseph Smith employed the chiastic form deliberately in the Doctrine and Covenants statistically indefensible.

Simple five-element chiastic structure appears once in the Doctrine and Covenants, whereas it, or stronger structure, appears four times in the Book of Mormon (line 5). The larger the number of times chiastic structure actually appears in a work, the smaller the likelihood that such structure could have appeared by chance. Accordingly, the likelihood  $P = 0.020$  that simple five-element structure would appear at least four times in the Book of Mormon is much smaller than the likelihood  $P = 0.52$  that simple five-element structure would appear at least once in the Doctrine and Covenants.

Metcalf proposes a four-element chiasm in Mosiah 5:9–10 that overlaps asymmetrically with Mosiah 5:10–12 (Example 2).<sup>53</sup> Many such overlapping structures have been found in the Doctrine and Covenants.<sup>54</sup> Only simple chiasms are free of such overlapping structures. Such overlapping structures do not, in themselves, necessarily imply lack of intentional design.

**Line 3.** Weak unintentional chiastic structure, which can be found in almost any text, is typically accompanied by moderate or large values of  $P$  and considerable extra repetition of literary elements. We have demonstrated this with the *INFORMIX Guide* example, for which  $P = 0.66$ , despite its having nine chiastic elements. This chiastic structure was likely

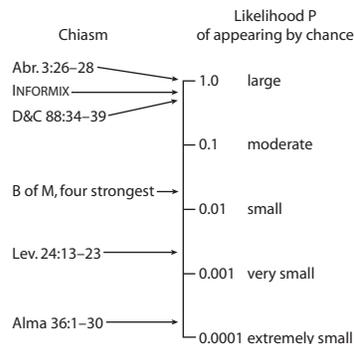
identified first by readers of this passage and was not intended by its author. On the other hand, the vastly smaller value  $P = 0.00018$  for Alma 36 indicates that its chiastic structure was likely intended by its author and is not simply an unintended pattern within apparently random data.<sup>55</sup>

**Line 1.** Our large value  $P = 0.98$  for the strongest chiasm in the Book of Abraham, Abraham 3:26–28, leads to the same basic conclusion as for the Doctrine and Covenants. Even this large value does not rule out the possibility that the chiastic structure appeared by design in the Book of Abraham, though it does not establish this as being likely or statistically defensible.

Figure 1 displays, on a number line, the values of  $P$  for chiasms appearing in Table 1, including word descriptions of the likelihoods that such values could have resulted by chance. The lower the value of  $P$  for a chiasm, the smaller the likelihood that it appeared by chance and the greater the likelihood that it appeared by design. Thus the moderate and large values of  $P$  for chiasms in the Book of Abraham, the *INFORMIX Guide*, and the Doctrine and Covenants indicate that these chiasms could easily have appeared by chance, whereas the small values of  $P$  for chiasms in the Book of Mormon and the Pentateuch indicate that these chiasms likely appeared by design.

Statistical analysis, of course, is incapable of absolutely refuting the hypothesis that a chiasm appeared by design in a literary work. Such analysis is limited to either supporting such a hypothesis or rendering it statistically indefensible. Our results support the hypothesis that chiasmus appeared by design in the Book of Mormon and render the hypothesis that

**FIGURE 1**  
**Values of  $P$  for Chiasms Appearing in Table 1**



chiasmus appeared by design in the Doctrine and Covenants statistically indefensible. Our results do not rule out this latter hypothesis; they simply rule out the argument that chiasms in the Doctrine and Covenants provide evidence that Joseph Smith knew about chiasmus.

As mentioned earlier, the historical record is silent about whether Joseph Smith knew about chiasmus. Given our evidence that chiasmus likely appeared in the Book of Mormon by design, would the discovery of historical evidence that Joseph Smith actually knew about chiasmus imply that Joseph Smith deliberately wrote and incorporated chiastic passages into the Book of Mormon? Not necessarily. Such a discovery would imply only that Joseph Smith could have done so and would not necessarily imply that he did so. Using chiasmus to strengthen the claim of the authenticity of the Book of Mormon as an ancient historical record is based on the assumption that Joseph Smith was unaware of chiasmus.

Chiastic patterns in the Doctrine and Covenants may have been incorporated intentionally by the Lord into the text revealed to Joseph Smith.<sup>56</sup> However, the evidence is insufficient to show that such patterns *were* incorporated intentionally into the text rather than being unintentional patterns discovered in later analysis. In the absence of such evidence, the insights gleaned from the study of such patterns may be highly subjective and may not reflect the intended emphasis of passages in the Doctrine and Covenants.

In carrying out this study, we have developed several tools that may be applied to evaluate the likelihood of chiastic structure in any passage of text. To obtain a rough idea about this likelihood without performing detailed calculations, one may count the total number of appearances of each chiastic and nonchiastic element within a passage. In general, the greater the numbers of extra appearances of chiastic elements and of appearances of nonchiastic elements, the greater the likelihood that chiastic structure appeared by chance; chiasms with fewer nonchiastic elements and with many chiastic elements that appear exactly twice each have smaller likelihoods of appearing by chance.

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Boyd F. Edwards (bedwards@wvu.edu) is Professor of Physics at West Virginia University. He obtained a PhD in Applied Physics from Stanford University.

W. Farrell Edwards (farrell@cc.usu.edu) is Professor of Physics at Utah State University. He obtained a PhD in Physics from California Institute of Technology.

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10. Metcalfe, "Apologetic and Critical Assumptions," 166–67.
11. <http://www.lds-mormon.com/chiasm.shtml> (accessed March 10, 2004).

12. Shipp, "Conceptual Patterns of Repetition," 159–60.
13. H. Clay Gorton, *Language of the Lord: New Discoveries of Chiasma in the Doctrine and Covenants* (Bountiful, Utah: Horizon, 1993), 9–10; Charles Francis King, *Doctrine and Covenants Completely Structured (including Chiasmus)* (Provo, Utah: By the author, 2000), 1–5.
14. Daniel C. Peterson, "A Modern Malleus Maleficarum," review of *The Best Kept Secrets in the Book of Mormon*, by Loftes Tryk, *Review of Books on the Book of Mormon* 3, no. 1 (1991): 84.
15. John W. Welch, "Criteria for Identifying and Evaluating the Presence of Chiasmus," FARMS paper (1988), published in *Journal of Book of Mormon Studies* 4, no. 2 (1995), reprinted in John W. Welch and Daniel B. McKinlay, eds., *Chiasmus Bibliography* (Provo, Utah: Research Press, 1999), 157–74, available online at <http://farmsresearch.com>. That bibliography lists hundreds of publications analyzing or utilizing chiasmus.
16. For an illustration of how this statistical analysis is performed, see the longer version of this paper posted on <http://byustudies.byu.edu/chiasmus>.
17. There are rare exceptions to this in which the subject matter itself has natural many-element chiastic order, such as a story of a person who travels from the ground floor to the tenth floor and back again, with each floor mentioned in the story as it is passed. In this case, a small value of  $P$  would result not from deliberate ordering of ideas by the author, but from the natural order of ideas in the subject matter itself.
18. Welch, "Criteria for Identifying."
19. Yehuda T. Radday, "Chiasmus in Hebrew Biblical Narrative," in *Chiasmus in Antiquity*, ed. John W. Welch (Hildesheim: Gerstenberg, 1981; repr., Provo, Utah: Research Press, 1998), 52.
20. Vogel, "Use and Abuse of Chiasmus."
21. For references and commentary on Thomas Boys's 1825 discovery of the chiastic structure of Leviticus 24, see John W. Welch, "Chiasmus in Biblical Law," in *Jewish Law Association Studies IV: The Boston Conference Volume*, ed. Bernard S. Jackson (Atlanta: Scholars Press, 1990), 8; and Welch, "How Much Was Known about Chiasmus," 61–63, 70–72.
22. Welch, "Chiasmus in the Book of Mormon," 77.
23. Welch, "Chiasmus in the Book of Mormon," 77.
24. Welch, "Chiasmus in the Book of Mormon," 83.
25. John W. Welch, "Chiasmus in Helaman 6:9–11," in *Reexploring the Book of Mormon*, ed. John W. Welch (Salt Lake City: Deseret Book; Provo, Utah: FARMS, 1992), 230–32. Helaman 6:9–11 (Example 9) is the six-element central portion of the complex eight-element chiasm in Helaman 6:7–13 discussed in this reference. This latter chiasm has these chiastic elements: peace (2x), land (3x), they became rich (2x), plenty of gold, silver, and precious metals in both lands (2x), land south (2x), Lehi (2x), land north (2x), Mulek (2x). It also has these nonchiastic elements: Nephites (4x), Lamanites (4x). Random rearrangements of all of these elements gives  $L = 0.00052$  for eight-element structure, which is larger than the value  $L = 0.000096$  obtained for Helaman 6:9–11 but is smaller than the value  $L = 0.0011$  for a simple five-element chiasm. Thus, either way the Helaman 6 chiasm is

rendered, it has a lower value of  $L$  than a simple five-element chiasm and therefore qualifies to be among the strongest four chiasms in the Book of Mormon.

26. Welch, "Criteria for Identifying."

27. Welch, "Criteria for Identifying."

28. Welch, "Criteria for Identifying."

29. Vogel, "Use and Abuse of Chiasmus."

30. Welch, "Chiasmus in the Book of Mormon," 72.

31. King, *Doctrine and Covenants Completely Structured*, 5.

32. Dietrich Stauffer and Amnon Aharoni, *Introduction to Percolation Theory*, 2d ed. (Washington, D.C.: Taylor and Francis, 1992), 47; Philip R. Bevington and D. Keith Robinson, *Data Reduction and Error Analysis for the Physical Sciences*, 2d ed. (New York: McGraw-Hill, 1992), 38–39.

33. The computer program that we wrote to calculate  $L$  and  $P$  is available for free download at <http://byustudies.byu.edu/chiasmus>. This program allows the tools developed in this paper to be applied to the analysis of other chiasms.

34. David O. Peterson, "Chiasmus, the Hebrews, and the Pearl of Great Price," *New Era* (August 1972): 40–43. See also a response to this article by James R. Clark, *New Era* (October 1972): 3; Ostler, review of *Book of Mormon Authorship*, 140–44; Metcalfe, "Apologetic and Critical Assumptions," 62–71; Hamblin, review of "Apologetic and Critical Assumptions," 434–523. See Appendix C online at <http://byustudies.byu.edu/chiasmus> for details.

35. See Appendix D online at <http://byustudies.byu.edu/chiasmus> for details.

36. See Appendix E online at <http://byustudies.byu.edu/chiasmus> for details. Shipp, "Conceptual Patterns of Repetition," 32–34; Ostler, review of *Book of Mormon Authorship*, 140–44; Gorton, *Language of the Lord*, 9–10; Metcalfe, "Apologetic and Critical Assumptions," 163–77; King, *Doctrine and Covenants Completely Structured*, 1–6.

37. See Appendix F online at <http://byustudies.byu.edu/chiasmus> for details.

38. See Appendix G online at <http://byustudies.byu.edu/chiasmus> for details. Welch, "Chiasmus in the Book of Mormon," 69–84; Welch, *Reexploring the Book of Mormon*, 230–32; John W. Welch, *Chiasmus in Alma 36* (Provo, Utah: FARMS, 1989); John W. Welch, "A Masterpiece: Alma 36," in *Rediscovering the Book of Mormon*, ed. John L. Sorenson and Melvin J. Thorne (Salt Lake City: Deseret Book, 1991); Donald W. Parry, *Book of Mormon Text Reformatted according to Parallelistic Patterns* (Provo, Utah: FARMS, 1992).

39. Welch, "Chiasmus in the Book of Mormon," 77.

40. Welch, *Reexploring the Book of Mormon*, 230–32.

41. See Appendix I online at <http://byustudies.byu.edu/chiasmus> for details.

42. See Appendix A online at <http://byustudies.byu.edu/chiasmus> for details.

43. Nadine W. Edwards, private communication with Boyd F. Edwards, April 1, 2000, regarding her discovery of chiastic structure in Ezekiel 34:2–16.

44. Thomas Boys, *Tactica Sacra: An Attempt to Develop, and to Exhibit to the Eye by Tabular Arrangements, a General Rule of Composition Prevailing in the Holy Scriptures* (London: Hamilton, 1824), 67; John W. Welch and John F. Hall, *Charting the New Testament* (Provo, Utah: FARMS, 2002), chart 15–20.

45. See Welch, "Chiasmus in Biblical Law," 8; and Welch, "How Much Was Known about Chiasmus."

46. See Appendix J online at <http://byustudies.byu.edu/chiasmus> for details.

47. Welch, *Chiasmus in Alma 36*.

48. See Vogel, "Use and Abuse of Chiasmus;" <http://www.lds-mormon.com/chiasm.shtml> (accessed March 11, 2004); Metcalfe, "Apologetic and Critical Assumptions," 162–71; and Hamblin, review of "Apologetic and Critical Assumptions," 434–523.

49. Welch, "A Masterpiece: Alma 36," 114–15; Parry, *Book of Mormon Text Reformatted*, 278–81, which displays the words of the entire chapter.

50. See Appendix H online at <http://byustudies.byu.edu/chiasmus> for the full text of our eight- and ten-element renderings of Alma 36.

51. See Vogel, "Use and Abuse of Chiasmus;" <http://www.lds-mormon.com/chiasm.shtml> (accessed March 11, 2004); Metcalfe, "Apologetic and Critical Assumptions," 162–71; and Hamblin, review of "Apologetic and Critical Assumptions," 434–523.

52. Shipp, "Conceptual Patterns of Repetition," 157–60; Gorton, *Language of the Lord*, 9–10; King, *Doctrine and Covenants Completely Structured*, 1–6.

53. Metcalfe, "Apologetic and Critical Assumptions," 162–71; Hamblin, review of "Apologetic and Critical Assumptions," 166–67, 434–523.

54. Shipp, "Conceptual Patterns of Repetition," 32–34; Gorton, *Language of the Lord*, 10; King, *Doctrine and Covenants Completely Structured*, 1–6.

55. <http://www.lds-mormon.com/chiasm.shtml> (accessed March 11, 2004).

56. Shipp, "Conceptual Patterns of Repetition," 32–34; Gorton, *Language of the Lord*, 9–10; King, *Doctrine and Covenants Completely Structured*, 1–6.

**Supplemental Material 1** (Edwards Page105) [back to Edwards p. 105](#)

Jerald and Sandra Tanner state; “Even if it could be established that there are real chiasms in the Book of Mormon, it would not prove anything more than that Joseph Smith borrowed from the style of chiastic passages found in the Bible. We believe, however, that wishful thinking plays a very important role in this fervent search for chiasmus in Joseph Smith's work. We doubt very much that there is any deliberate attempt at chiastic structure in the Book of Mormon and feel that what has been identified as chiasmus is merely evidence of Joseph Smith's repetitive style of writing.” See Jerald and Sandra Tanner, *Salt Lake City Messenger*, no. 72, <http://www.utlm.org/newsletters/no72.htm> (accessed August 3, 2004),

**Supplemental Material 2** (Edwards Page 106) [back to Edwards p. 106](#)

Tryk also points out chiastic passages in the Book of Ether, Moroni's abridgment of the plates of Ether, which were written before chiasmus first appeared in literature.<sup>1</sup> However, it is not known whether these chiastic passages were written by Moroni or Ether. Moroni identifies himself explicitly as the author of many comments in the book, and must have authored many other passages which refer to people or events after Ether's time (see Ether 4:1, for example).<sup>2</sup> The prevalence of such passages suggests that Moroni may have seldom quoted Ether directly, choosing instead to describe events in his own words. Only one sentence, in the last verse of the Book, is clearly identified as a direct quote of Ether. This sentence is not chiastic.

<sup>1</sup> Loftes Tryk, *The Best Kept Secrets in the Book of Mormon*, Redondo Beach, CA, Jacob's Well Foundation, Appendix D (1988).

<sup>2</sup> John W. Welch and J. Gregory Welch, *Charting the Book of Mormon*, Chart 15 (Provo:FARMS, 1999).

**Supplemental Material 3** (Edwards Page 108) [back to Edwards p. 108](#)

To determine the likelihood (L) that a two-element chiasm could have emerged by chance in any one of the three opportunities in this example, we consider all possible rearrangements of the order of the elements in one opportunity. There are six such orderings; abba, baab, aabb, bbaa, abab, and baba, each being equally likely to be selected in a random drawing. Since only the first two are chiastic, the ratio of the number of chiastic orderings to the total number of orderings is  $L = 2/6 = 1/3 = 0.33$ . In other words, each random rearrangement of a two-element chiasm with no extra repetition has one chance in three (a 33% chance) of being chiastic, and two chances in three of not being chiastic.

To determine the likelihood (P) that a two-element chiasm could have emerged by chance in at least one of the three opportunities in this example, we note that  $(2/3)^3 = (2/3)(2/3)(2/3)$  gives the likelihood that all three opportunities would not be chiastic, and that  $P = 1 - (2/3)^3 = 0.70$  gives the likelihood that at least one opportunity would be chiastic. Accordingly, there is a 70% chance that at least one two-element chiasm with no extra repetition would appear by chance somewhere in Matt. 13:35-39, if the elements within all three opportunities for such structure were rearranged randomly. Note here that P is *not* the sum of probabilities for the three opportunities, or  $P = 1/3 + 1/3 + 1/3 = 1$ , which would erroneously imply that chiastic structure would always be guaranteed after three tries. Such reasoning would also erroneously imply that flipping two coins would always yield at least one “heads.”

**Supplemental Material 4** (Edwards Page 116) [back to Edwards p. 116](#)

To illustrate this technique, we determine L for D&C 67:11,12:

For no **man** has seen **God** at any time in the flesh, except quickened by the Spirit of **God**. *Neither* can any natural **man** abide the presence of *God*, *neither* after the carnal mind.

As rendered here, the chiastic elements a = “man” and b = “God” each appear twice in the chiastic structure (in bold face), element b has one extra appearance (italicized), and the nonchiastic element c = “neither” appears twice (also italicized). The idea is to use a computer to randomly rearrange the structure **abbabc** of the passage, and to determine the fraction of these rearrangements that include a two-element chiasm, that is, the same level of chiastic structure as the passage itself. For examples, the rearrangement aabbcc does not include a two-element chiasm, whereas the rearrangements *bbcacba* and **abccbab** do. That this last rearrangement also contains a three-element chiasm is unimportant here; only its two-element structure matters. If the computer generated only these three rearrangements, then the estimate  $L = 2 / 3 = 0.67$  would follow as the ratio of rearrangements that include a two-element chiasm to the total number of rearrangements.

**Supplemental Material 5** (Edwards Page 116) [back to Edwards p. 116](#)

A Monte Carlo computer simulation of D&C 67:11,12 with 10,000 rearrangements yielded 8710 two-element chiasms, resulting in the accurate estimate  $L = (8710 \pm \sqrt{8710}) / 10,000 = 0.87 \pm 0.01$ .

**Supplemental Material 6** (Edwards Page 116) [back to Edwards p. 116](#)

The computer program has also been tested for a complex chiasm consisting of three appearances of element “a” and two of “b.” This chiasm has only ten rearrangements; **aabba**, **abbaa**, **abaab**, **ababa**, **baaba**, **baaab**, **aaabb**, **aabab**, **bbaaa**, **babaa**. Since the first six are chiastic, the exact likelihood is  $L = 6/10 = 0.6$ . This agrees with our simulation result  $L = 0.5998 \pm 0.0002$  involving ten million random orderings.

**Supplemental Material 7** (Edwards Page 123) [back to Edwards p. 123](#)

Since the chiasmic building blocks of the eight-element structure are complete ideas, we may ignore extra repetition of individual words in the structure (Rules 5 and 6). Nevertheless, with few exceptions, this structure confines individual words and short phrases to their appropriate sections as well:

- (a, a´) keep the commandments, prosper, in the land
- (b, b´) remember captivity
- (c, c´) deliver them, bondage, captivity
- (d, d´) supported, trials, deliver me
- (e, e´) labor, taste, eye
- (f, f´) destroy
- (g, g´) pain, racked, bitter, soul, memory, my sins, remember sins, remember pains
- (h, h´) Jesus

Exceptions include: my words (a, d), I say unto you (e, g´), as I do know (e´, a´) and joy (e´, g´).

**Supplemental Material 8** (Edwards Page 128) [back to Edwards p. 128](#)

Loftes Tryk, *The Best Kept Secrets in the Book of Mormon*, Redondo Beach, CA, Jacob's Well Foundation, p. 84 (1988);

**Appendix A:**  
**General Calculation of the Chiasmic Likelihood, P** [back to Edwards p. 120](#)

Equation 1 fails when the chiasmic structure of interest appears more than once in the larger work. To determine P for this case, one must not only estimate the total number N of opportunities for comparable chiasmic structure in the work, but must also determine or estimate the number M of chiasms in the work that actually have such structure.

Thus we consider the general case when chiasmic structure emerges in a number M of the N opportunities, and does not emerge in the remaining N-M opportunities. This case, which involves some standard college algebra, applies to only one listing in Table 1 (Line 5). Determining M is important because it is less likely for a particular chiasmic structure to appear more than once by chance in a work than for it to appear only once. To obtain statistically valid results, N and M must include all chiasms with likelihoods that are equal to or smaller than some specified value. For example, the analysis of the likelihood of simple five-element chiasmic structure in the Book of Mormon (Table 1, Line 5) must include Alma 36 in the number M of opportunities for simple five-element structure, since Alma 36 includes five-element structure within its eight-element structure. For another example, the first of the N=3 opportunities for simple two-element chiasmic structure in Example 5 also has the opportunity for simple three-element structure, with

the chiastic elements “mother,” “daughter,” and “in law,” and is therefore included in the number  $N=3$  of opportunities for two-element structure. For Example 5, we have  $M = 1$  since only one of its  $N = 3$  opportunities for two-element chiastic structure is chiastic. Had two of these three opportunities actually formed two-element chiasms, then we would have had  $M = 2$ .

To calculate  $P$  in this general case, we consider the binomial expansion

$$1 = [L + (1 - L)]^N = \sum_{m=0}^N P_m = P' + P,$$

where  $P_m = N!L^m(1 - L)^{N-m}[m!(N-m)!]^{-1}$  is the likelihood that chiastic structure will emerge in exactly  $m$  opportunities,  $P' = \sum_{m=0}^{M-1} P_m$  is the likelihood that chiastic structure will emerge in fewer than  $M$  opportunities, and  $P = \sum_{m=M}^N P_m$  is the likelihood that chiastic structure will emerge in at least  $M$  opportunities. Here,  $m! = 1 \cdot 2 \cdot 3 \dots m$  is a product of  $m$  integers called “ $m$  factorial,” with  $0! = 1$ , and  $\sum_{m=0}^N P_m = P_0 + P_1 + \dots + P_N$  is the sum of the values of  $P_m$  for all values of  $m$ . Rearranging yields the desired chiastic likelihood

$$P = 1 - \sum_{m=0}^{M-1} P_m. \quad (\text{Equation 3})$$

Writing

$$\begin{aligned} P_0 &= (1 - L)^N \\ P_1 &= NL(1 - L)^{N-1} \\ P_2 &= N(N-1)2^{-1}L^2(1 - L)^{N-2} \\ P_3 &= N(N-1)(N-2)6^{-1}L^3(1 - L)^{N-3} \end{aligned} \quad (\text{Equation 4})$$

allows us to obtain

$$\begin{aligned} P &= 1 - P_0 && \text{for } M = 1 \\ P &= 1 - P_0 - P_1 && \text{for } M = 2 \\ P &= 1 - P_0 - P_1 - P_2 && \text{for } M = 3 \\ P &= 1 - P_0 - P_1 - P_2 - P_3 && \text{for } M = 4, \end{aligned} \quad (\text{Equation 5})$$

with obvious extensions to larger values of  $M$ . Evidently, the larger the number  $M$  of actual appearances of the desired chiastic structure in the larger work, the smaller the likelihood  $P$  that such chiastic structure emerged by chance. The  $M = 1$  result reproduces Equation 1. The  $M = 4$  result gives the upper limit  $P = 0.020$  on the likelihood that the four strongest chiasms could have appeared by chance in the Book of Mormon (Table 1, Line 5).

**Appendix B:**    [back to Edwards p. 115](#)  
**Derivation of the Reordering Likelihood L for Simple Chiasms**

Equation 2 may be derived by considering a subset of random orderings. For  $n = 2$ , reading from left to right, element a appears before element b in the orderings abba, aabb, and abab. Considering only this subset yields the same value of L as considering the entire set of orderings because the other subset (baab, bbaa, and baba, in which element b appears before element a) can be obtained from the first simply by interchanging the elements a and b. To enumerate the orderings in the first subset, we consider the number of ways that the second appearances of elements a and b may be inserted into the list of first appearances, ab, while preserving the order of these first appearances. The second appearance of element b may be inserted into this list only at the end of the list, giving the expanded list ab**b**. The second appearance of element a may be inserted into this expanded list in three different places; a**ab**b, ab**a**b, and ab**ba**. Thus, the total number of orderings in this subset is the product of the numbers of insertion points for the second appearances of elements b and a,  $1 \cdot 3 = 3$ . Since only one of these has chiasmic order,  $L = 1 / 3 = 0.33$ . This result was also obtained, using a different method, in the discussion following Example 5 above.

For  $n = 3$ , we consider the subset with the first elemental appearances abc, which order must be preserved while inserting the second appearances of each element. The second appearance of c may be inserted in only one place; ab**cc**. The second appearance of b may be inserted into this expanded list in three places, ab**b**cc, ab**cb**c, and ab**ccb**. The second appearance of a may be inserted into each of these three expanded lists in five different places;

abbcc:	aabbcc, ab <b>ab</b> cc, abbacc, ab <b>bc</b> ac, abbcca
abc <b>bc</b> :	aab <b>cb</b> c, ab <b>ac</b> bc, abc <b>ab</b> c, ab <b>cb</b> ac, ab <b>cb</b> ca
ab <b>ccb</b> :	aab <b>ccb</b> , ab <b>acc</b> b, ab <b>cac</b> b, ab <b>ccab</b> , ab <b>ccb</b> a

Thus, there is one insertion point for the second appearance of c, three for b, and five for a, and the total number of orderings is the product of these numbers of insertion points,  $1 \cdot 3 \cdot 5 = 15$ . Since only one of these has chiasmic order,  $L = 1 / 15 = 0.067$ .

For general  $n$ , the number of orderings in a subset is the product of the numbers of insertion points  $(2n-1)!! = 1 \cdot 3 \cdot 5 \dots (2n-1)$  of the second elemental appearances, while preserving the order of the first appearances. Since only one of these orderings has chiasmic order,  $L = 1 / (2n-1)!!$ . This is Equation 2, which has been confirmed to high precision via our independent *Monte Carlo* simulations (See the discussion following Table 2.)

**Appendix C:**    [back to Edwards p. 117](#) □  
**Proposed Chiasms in the Book of Abraham**

**Line 1.** Proposed chiasms in the Book of Abraham which have at least three chiasmic elements satisfying Rule 2 are summarized below, together with their reordering

likelihoods L, their chiastic elements, their nonchiastic elements, and the number of appearances of each element. To examine the chiastic structure in the actual passages from which these summaries are taken, one may read through the indicated text of the passage from the beginning, noting the appearances of chiastic elements in the order listed below. Once this list of chiastic elements is exhausted, read through the remainder of the passage, noting the appearances of chiastic elements in the reverse order. Once this basic structure is identified, extra appearances of chiastic elements and appearances of nonchiastic elements may be identified. Various appearances of the same element may differ slightly, in accordance with Rule 2. Consecutive appearances of a single element may be treated as a single appearance of that element, in accordance with Rule 4. Unrepeated central elements are ignored, since they do not affect L. Some of the chiastic structures summarized below have been modified slightly from the original proposals in order to facilitate valid calculations of L, in accordance with the six selection rules. Values of L for simple chiasms were taken from Table 2, whereas values for complex chiasms were computed using our *Monte Carlo* computer program, which is available for free download at <http://byustudies.byu.edu/chiasmus>. The simple three-element chiasm Abraham 3:26-28 (Example 7) has  $L = 0.067$  (Table 1, Line 1), the smallest value for those listed. Chiasms proposed in the Book of Abraham with fewer than three chiastic elements have larger values of L.

- Abraham 1:3**             $L = 0.20$   
 chiastic elements:    me (2x), fathers (2x), from the beginning (2x)  
 nonchiastic elements: time (2x)  
 source:                 David O. Peterson, "Chiasmus, the Hebrews, and the Pearl of Great Price," *The New Era*, August 1972 p. 43.
- Abraham 3:21**         $L = 0.38$   
 chiastic elements:    in the midst of (2x), I came down (2x), wisdom (2x)  
 nonchiastic elements: intelligences (2x), beginning (2x)  
 source:                 Brent Lee Metcalfe, "Apologetic and Critical Assumptions about Book of Mormon Historicity," *Dialogue: A Journal of Mormon Thought*, Vol. 26, No. 3, p. 163 (Fall 1993).
- Abraham 3:26-28**     $L = 0.067$                  (Example 7)  
 chiastic elements:    they who keep their first estate (2x), And the Lord said; Whom shall I send? (2x), Here am I, send me (2x)  
 nonchiastic elements: none  
 source:                 Blake Ostler, in a review of "Book of Mormon Authorship: New Light on Ancient Origins," *Dialogue: A Journal of Mormon Thought*, Vol. 16, No. 4, Winter, p. 142 (1983).

**Appendix D:**    [back to Edwards p. 117](#)

**Three-Element Opportunities in the Book of Abraham**

**Line 1.** Examination of 20 verses in the Book of Abraham (Abraham 1:1-8 and Abraham 3:1-12) reveals 8 passages which, if reordered properly, would form simple three-element

chiasms. Assuming that these verses are typical of the 136 verses in the Book, we estimate the number of opportunities for simple three-element structure in the Book of Abraham to be  $N = 136 \times 8 / 20 = 54$ . We use this estimate above to calculate the value of P for Abraham 3:26-28 (Example 7).

Abraham 1:

Opportunity 1

1 In the land of the Chaldeans, at the **residence** of my **fathers**, I, Abraham, saw that it was needful **for me** to obtain another place of **residence**;

2 And, finding there was greater happiness and peace and rest **for me**, I sought for the blessings of the **fathers**, and the right whereunto I should be ordained to administer the same;

Opportunity 2

2 (cont.) having been myself a **follower of righteousness, desiring** also to be one who possessed great **knowledge**, and to be a greater **follower of righteousness**, and to possess a greater **knowledge**, and to be a father of many nations, a prince of peace, and **desiring** to receive instructions, and to keep the commandments of God, I became a rightful heir, a High Priest, holding the right belonging to the fathers.

Opportunity 3

3 (It was conferred upon me from the **fathers**; it came down from the **fathers**,) **from the beginning** of time, yea, even **from the beginning**, or before the foundation of the earth, down to the present time, even the right of the firstborn, or the **first** man, who is Adam, our **first** (**father**, through the **fathers** unto me.)

Opportunity 4

4 I sought for mine **appointment** unto the Priesthood according to the **appointment** of **God** unto the **fathers** concerning the seed.

5 My **fathers**, having turned from their righteousness, and from the holy commandments which the Lord their **God** had given them,

Opportunity 5

7 Therefore they turned their hearts to the sacrifice of the heathen in **offering up their children unto these dumb idols**, and hearkened not unto my voice, but endeavored to take away my life by the hand of the **priest of Elkenah**. The **priest of Elkenah** was also the **priest of Pharaoh**.

8 Now, at this time it was the custom of the **priest of Pharaoh**, the king of Egypt, to offer up upon the altar which was built in the land of Chaldea, for the **offering unto these strange gods, men, women, and children**.

Abraham 3:

Opportunity 6

1 And I, Abraham, had the Urim and Thummim, which the Lord my **God** had given unto me, in Ur of the Chaldees;

2 And I saw the stars, that they were very **great**, and that **one of them was nearest** unto the throne of **God**; and there were many **great ones which were near** unto it;

Opportunity 7

5 And the Lord said unto me: The planet which is the **lesser** light, **lesser** than that which is to rule the day, even the night, is above or greater than that **upon which thou standest** in point of reckoning, for it moveth **in order** more slow; this is **in order** because it standeth above the earth **upon which thou standest**, therefore the reckoning of its time is not so many as to its number of days, and of months, and of years.

Opportunity 8

11 Thus I, Abraham, talked with the Lord, **face to face**, as one man talketh with another; and he told me of the works **which his hands had made**;

12 And he said unto me: **My son, my son** (and his hand was stretched out), behold I will show you all these. And he put his hand upon mine eyes, and I saw those **things which his hands had made**, which were many; and they multiplied before mine eyes, and I could not see the end thereof.

**Appendix E:** [back to Edwards p. 118](#)

### **Proposed Chiasms in the Doctrine and Covenants**

**Line 4.** Proposed chiasms in the Doctrine and Covenants which have at least five chiastic elements satisfying Rule 2 are summarized below, after the manner of Appendix C. The simple five-element chiasm D&C 88:34-39 (Example 3) has  $L = 0.0011$ , the smallest value for those listed. Chiasms in the Doctrine and Covenants with fewer than five chiastic elements have larger values of  $L$ . Even though many chiasms listed below have more than five elements, extra appearances of chiastic elements and the appearances of nonchiastic elements in these chiasms lead to values of  $L$  that are significantly larger than  $L = 0.0011$ .

**D&C 5:1-23**

$L = 0.21$

chiastic elements: desire a witness (2x), have commanded you (2x), me (5x), I commanded you (2x), inhabitants of the earth (2x), ordained (3x), believe my words (2x), testimony of three witnesses will I send forth of my word (2x), power (3x)

nonchiastic elements: testimony (3x), my servant Joseph (6x), plates (2x), receive (2x), purpose (2x), my word (4x), generation (4x), these things (6x)

source: H. Clay Gorton, *Language of the Lord: New Discoveries of Chiasma in the Doctrine and Covenants* (Horizon, Bountiful, UT 1993), p. 247-249.

**D&C 11:1-30** L = 0.25  
chiastic elements: I am ... God (2x), whoso desireth to reap let him thrust in his sickle (3x), treasure up (2x), seek (5x), if you desire (2x), keep my commandments (4x), desire of me in faith (3x), righteous (2x)  
nonchiastic elements: God (5x), you shall receive (2x), my Spirit (3x), my word (5x), children of men (2x), my rock and my Gospel (2x), my work (2x)  
source: Gorton, p. 27-33.

**D&C 29:30-33** L = 0.32  
chiastic elements: first (4x), all things (2x), I (2x), created (2x), power of my Spirit (2x)  
nonchiastic elements: spiritual (3x), temporal (3x), word (2x), last (2x)  
source: Richard C. Shipp, "Conceptual patterns of repetition in the Doctrine and Covenants and their implications," Brigham Young University thesis, p. 33 (1975).

**D&C 60:1-14** L = 0.36  
chiastic elements: return (5x), speedily (3x), to the land (4x), hide/bury the talent (2x), among the congregations of the wicked (3x)  
nonchiastic elements: proclaim my word (2x), church (2x)  
source: Gorton, p. 190-191.

**D&C 61:23-30** L = 0.26  
chiastic elements: my servants, Sidney Rigdon, Joseph Smith, Jun., and Oliver Cowdery (2x), journey (6x), saints (2x), land (3x), do (3x), commandment (4x), give (4x)  
nonchiastic elements: water (4x), canal (3x), Spirit (2x)  
source: Gorton, p. 242-243.

**D&C 63:17-49** L = 0.75  
chiastic elements: death / dead (2x), He that is faithful and endureth shall overcome (2x), my will (3x), land of Zion (9x), land (2x), I, the Lord, am angry with / will consume the wicked (2x)  
nonchiastic elements: I will (3x), inheritance (5x), commandment (3x), world (5x)  
source: Gorton, p. 268-270.

**D&C 88:34-39** L = 0.0011 (Example 3)  
chiastic elements: law / abide (2x), all kingdoms have a law given (2x), kingdoms (2x), there is no space (2x), there is no kingdom (2x)  
nonchiastic elements: none  
source: Shipp, p. 32.

**D&C 88:51-61** L = 0.053  
chiastic elements: I will liken all these kingdoms (2x), they all (2x), lord(5x), every man in his hour (2x), last (2x), first (4x)

nonchiastic elements: in his/its time and in his/its season (2x), light of the countenance of his lord (2x), glorified (2x)  
source: Gorton, p. 184-185.

**D&C 93:23-38** L = 0.98  
chiastic elements: beginning (5x), spirit (9x), truth (12x), God (9x), fulness (4x), man (11x), condemnation (2x), light (6x)  
nonchiastic elements: intelligence (3x), joy (2x), commandments (2x), temple (3x)  
source: Blake Ostler, in a review of "Book of Mormon Authorship: New Light on Ancient Origins," *Dialogue: A Journal of Mormon Thought*, Vol. 16, No. 4, Winter, p. 142 (1983).

**D&C 101:44-53** L = 0.13  
chiastic elements: watchman upon the tower (2x), olive-trees (4x), broke down (3x), enemy shall come (3x), lord commanded them (2x), What need hath my lord of this tower? (2x)  
nonchiastic elements: set watchmen (3x), build a tower (3x), servants of the nobleman (2x)  
source: Gorton, p. 275-276.

**D&C 104:68,69** L = 0.015  
chiastic elements: hundred (2x), fifty (2x), twenty (2x), ten (2x), five (2x)  
nonchiastic elements: cast into the treasury (2x), let him (2x)  
source: Gorton, p. 171

**D&C 107:8-18** L = 0.85  
chiastic elements: Melchizedek Priesthood (6x), power and authority (2x), officiate in all the offices (3x), right to officiate / office (4x), administer (4x)  
nonchiastic elements: spiritual (4x), Aaron (3x)  
source: Gorton, p. 186-187.

**D&C 107:72-76** L = 0.077  
chiastic elements: a judge in Israel (2x), to sit (2x), counselors (2x), bishop (4x), literal descendant of Aaron (2x), judge in Zion (2x), of Zion (2x)  
nonchiastic elements: of the church (3x), act in the office (2x), High Priesthood after the order of Melchizedek (2x), this ministry (2x)  
source: Gorton, p. 196-197.

**D&C 109:29-50** L = 0.35  
chiastic elements: repent (2x), ears (2x), for thou knowest, O Lord (2x), yoke (2x), Break it off, O Lord (2x), testimony (3x), seal up the law (2x), judgments (4x), And whatsoever city thy servants shall enter, and the people of that city receive their testimony (2x)  
nonchiastic elements: servants (7x), suffer (2x), people (6x), deliver (3x), generation (2x), blood (2x), men (3x), transgressions (2x), O Lord (5x),

prepare (2x), O Jehovah (2x), mouth of thy prophets (2x), heart (2x)

source: Gorton, p. 311-313.

**Appendix F:** [back to Edwards p. 118](#)

**Five-Element Opportunities in the Doctrine and Covenants**

**Line 4.** Examination of 62 verses in the Doctrine and Covenants (D & C 1:1-26 and D & C 88:40-75) reveals 12 passages which, if reordered properly, would form simple five-element chiasms. We assume that these verses are typical of the 3545 verses in sections 1–134 and 137 for which Joseph Smith was responsible, and accordingly obtain the estimated value  $N = 3545 \times 12 / 62 = 686$  of the number of opportunities for simple five-element chiastic structure in the Doctrine and Covenants. This value is used above to determine the value of P for D & C 88:34-39 (Example 3 above). In Opportunity 3 below, the two consecutive instances of “of the Lord” appearing in verse 14 are treated as a single literary element, in accordance with Rule 4.

D&C 1:

Opportunity 1

3 And the **rebellious** shall be pierced with much sorrow; for their iniquities shall be spoken upon the housetops, and their secret acts shall be revealed.

4 And the voice of warning shall be unto all **people**, by the mouths of my disciples, whom I have chosen in these last days.

5 And **they shall go forth** and none shall stay them, for I the Lord have commanded them.

6 Behold, this is mine **authority**, and the **authority** of my servants, and my preface unto the book of my commandments, which I have given them to publish unto you, O **inhabitants of the earth**.

7 Wherefore, fear and tremble, O ye **people**, for what I the Lord have decreed in them shall be fulfilled.

8 And verily I say unto you, that **they who go forth**, bearing these tidings unto the **inhabitants of the earth**, to them is power given to seal both on earth and in heaven, the unbelieving and **rebellious**;

Opportunity 2

9 Yea, verily, to seal them up **unto the day** when the wrath of God shall be poured out upon the wicked without **measure**—

10 **Unto the day** when **the Lord** shall come to recompense unto every man according to his work, and **measure to every man** according to the **measure** which he has **measured to his fellow men**.

11 Wherefore the voice of **the Lord** is unto the ends of the earth, that all that will **hear** may **hear**:

### Opportunity 3

12 **Prepare ye, prepare ye** for that which is to come, for **the Lord** is nigh;

13 (And the anger **of the Lord** is kindled, and his sword is bathed in heaven, and it shall fall upon the inhabitants of the earth.

14 And the arm **of the Lord** shall be revealed;) and the day cometh that they who will not hear (the voice **of the Lord**, neither the voice of his servants,) neither give heed to the words of the prophets and apostles, shall be cut off from among the people;

15 For they have strayed from mine ordinances, and have broken mine everlasting covenant;

16 They seek not **the Lord** to establish his righteousness, but every man walketh in his own way, and after the **image** of his own god, whose **image** is in the likeness of the world, and whose substance is that of an idol, which waxeth old and shall perish in **Babylon**, even **Babylon** the great, which shall fall.

### Opportunity 4

20 But that every man might **speak** in the name of **God** the Lord, even the Savior of the **world**;

21 That faith also might increase in the earth;

22 That mine everlasting covenant might be established;

23 That the fulness of my gospel might be proclaimed by the **weak** and the simple unto the ends of the **world**, and before kings and rulers.

24 Behold, I am **God** and have **spoken** it; these commandments are of me, and were given unto my servants in their **weakness**, after the manner of their language, that they might come to understanding.

25 And **inasmuch** as they erred it might be made known;

26 And **inasmuch** as they sought wisdom they might be instructed;

D&C 88:

### Opportunity 5

40 For **intelligence** cleaveth unto **intelligence**; **wisdom** receiveth **wisdom**; **truth** embraceth **truth**; **virtue** loveth **virtue**; **light** cleaveth unto **light**;

### Opportunity 6

40 (cont) **mercy** hath compassion on **mercy** and **claimeth her own**; justice continueth its course and **claimeth its own**; (judgement goeth before the face of him who sitteth upon the throne and governeth and executeth **all things**.)

41 He comprehendeth **all things**, and **all things** are before him, and **all things** are round about him; and he is above **all things**, and in **all things**,) (and is through **all things**, and is round about **all things**; and **all things** are by him, and of him, even God, forever and ever.)

42 And again, verily I say unto you, he hath given a law unto **all things**, by which they move in their times and their seasons;

43 And their **courses** are fixed, even the **courses** of the heavens and the **earth**, which comprehend the **earth** and all the planets.

Opportunity 7

45 The earth rolls upon her wings, and the sun giveth his light by day, and the moon giveth her **light** by night, and the stars also give their **light**, as they roll upon their wings in their glory, in the midst of the **power of God**.

46 Unto what shall I liken these **kingdoms**, that ye may understand?

47 Behold, all these are **kingdoms**, and any man who **hath seen** any or the least of these **hath seen God** moving in his majesty and **power**.

Opportunity 8

52 And he said unto the **first: Go ye and labor in the field**, and in the **first** hour I will come unto you, and ye shall behold the **joy of my countenance**.

53 And he said unto the **second: Go ye also into the field**, and in the **second** hour **I will visit you** with the **joy of my countenance**.

54 And also unto the third, saying: **I will visit you**;

Opportunity 9

55 And unto the fourth, and so on unto the **twelfth**.

56 And the lord of the field went unto the (**first in the first**) (**hour**, and tarried with him all that **hour**;) and he was made glad with the **light of the countenance of his lord**.

57 And then he withdrew from the **first** that he might visit the second also, and the third, and the fourth, and so on unto the **twelfth**.

58 And thus they all received the **light of the countenance of their lord**, every man in his **hour**, and in his time, and in his season—

59 **Beginning at the first, and so on unto the last, and from the last unto the first, and from the first unto the last**;

Opportunity 10

63 **Draw near** unto me and I will **draw near** unto you; seek me diligently and **ye shall** find me; ask, and **ye shall** receive; knock, and it shall be opened unto you.

64 Whatsoever **ye ask** the Father in my name it shall be given unto you, that is **expedient for you**;

65 And if **ye ask** anything that is not **expedient for you**, it shall turn unto your condemnation.

66. Behold, that which you hear is as the voice of one crying in the **wilderness**—in the **wilderness**, because you cannot see him—

Opportunity 11

66 (cont) **my voice**, because **my voice** is **Spirit**; my **Spirit** is **truth**; **truth** abideth and hath no end; and if it be in you it shall abound.

67 And if your eye be **single** to my glory, your whole **bodies shall be filled with light**, and there shall be no darkness in you; and that **body which is filled with light** comprehendeth all things.

68 Therefore, sanctify yourselves that your minds become **single** to God, and the days will come that you shall see him; for he will unveil his face unto you, and it shall be in his own time, and in his own way, and according to his own will.

Opportunity 12

73 And **I will** hasten my work in its time.

74 And I give unto you, who are the first laborers in this last kingdom, a commandment that you assemble yourselves together, and organize yourselves, and prepare yourselves, and sanctify yourselves; yea, purify your hearts, and cleanse your hands and your feet before me, that I may make you **clean**;

75 That **I may** testify unto your Father, and you **God**, and my **God**, that you are **clean** from the blood of this wicked generation; that **I may** fulfil this **promise**, this great and last **promise**, which I have made unto you, when **I will**.

**Appendix G:** [back to Edwards p. 118](#)□

### **Proposed Chiasms in the Book of Mormon**

**Lines 5 and 7.** Proposed chiasms in the Book of Mormon which have at least five chiastic elements satisfying Rule 2 are summarized below, after the manner of Appendix C. Only the four strongest chiasms, Mosiah 3:18-20, Mosiah 5:10-12, Alma 36:1-30, and Helaman 6:9-11, (Examples 8, 2, 11, and 9, respectively) have values of L that are less than or equal to  $L = 0.0011$  for a simple five-element chiasm. Chiasms in the Book of Mormon with fewer than five chiastic elements have larger values of L.

**1 Nephi 3:3-12**       $L = 0.016$   
chiastic elements:    Laban hath the record of the Jews and a genealogy, engraved on plates of brass (2x), go unto the house of Laban (2x), brothers (4x), I, Nephi (2x), my father (2x), do the things (2x), Lord hath commanded (5x)  
nonchiastic elements: blessed / favored of the Lord (2x), murmur (2x), wilderness (2x), lot (2x)  
source:                Donald W. Parry, "Book of Mormon Text Reformatted according to Parallelistic Patterns," (Provo:FARMS, 1992) p. 4.

**1 Nephi 13:39-42**     $L = 0.16$   
chiastic elements:    the Gentiles (4x), the Jews (4x), all the earth (2x), establish (3x), the twelve apostles of the Lamb (3x), make known (2x), the Lamb (4x), must come (2x)  
nonchiastic elements: the words (2x), records (4x), he shall manifest himself (3x), last (3x), first (2x), seed (2x)  
source:                Parry, p. 23.

**1 Nephi 15:7-12**     $L = 0.030$   
chiastic elements:    our father (2x), olive-tree (2x), known unto (2x), keep the commandments (2x), hardness of your hearts (2x)  
nonchiastic elements: the house of Israel (2x), of the Lord (3x)  
source:                Parry, p. 26.

- Mosiah 3:18-20** L = 0.0011 (Example 8)  
 chiastic elements: humble (2x), become as little children (2x), salvation is in the atoning blood of Christ (2x), natural man (2x), has been (2x)  
 nonchiastic elements: none  
 source: John W. Welch, "Chiasmus in the Book of Mormon," BYU Studies **10**, 77 (1969).
- Mosiah 5:10-12** L = 0.00078 (Example 2)  
 chiastic elements: name (6x), called (3x), findeth himself on the left hand of God (2x), I would that ye should remember (2x), I said (2x), never should be blotted out (2x), transgression (2x)  
 nonchiastic elements: hearts (2x)  
 source: Welch, p. 77
- Alma 5:44-49** L = 0.16  
 chiastic elements: I am called according to the holy order (2x), Jesus Christ (2x), the things spoken are true (3x), they are made known unto me by the Holy Spirit of God (2x), I know of myself (4x)  
 nonchiastic elements: I say unto you (7x)  
 source: Parry, p. 207-208
- Alma 20:26-27** L = 0.069  
 chiastic elements: desire (4x), son Lamoni (3x), astonished (2x), release thy brethren (2x), I will grant (2x)  
 nonchiastic elements: kingdom (3x)  
 source: Parry, 244
- Alma 31:17-23** L = 0.058  
 chiastic elements: God (5x), thank (5x), belief (2x), lead (2x), chosen (2x), every man did go forth and offer up these same prayers (2x), stand (3x)  
 nonchiastic elements: elected (2x), traditions of our brethren (2x), people (2x), holy (3x)  
 source: Parry, p. 268.
- Alma 36:1-30** L = 0.00000049 (Example 11)  
 chiastic elements: Inasmuch as ye shall keep the commandments of God ye shall prosper in the land. (2x) Ye should do as I have done, in remembering the captivity of our fathers. (2x) God delivered our fathers from bondage. (2x) Those who trust God will be supported in their trials and lifted up at the last day. (2x) I (and others) received knowledge of God, and were born of God. (2x) I fell (stood) and lost (regained) the use of my limbs. (2x) I feared (longed) to be with God and was harrowed up by the memory of my sins (no more). (2x) I remembered (appealed to) Jesus Christ, son of God.  
 nonchiastic elements: none  
 source: Welch, p. 83

**Helaman 6:9-11** L = 0.000096 (Example 9)  
 chiastic elements: they became rich (2x), plenty of gold, silver, and precious metals in both lands (2x), land south (2x), Lehi (2x), land north (2x), Mulek (2x)  
 nonchiastic elements: none  
 source: John W. Welch, Ed. *Reexploring the Book of Mormon*, Ch. 66: Chiasmus in Helaman 6:7-13 (Deseret Book: Salt Lake City, and FARMS: Provo, 1992). See also Footnote 26.

**Helaman 13:24,25** L = 0.015  
 chiastic elements: cast out the prophets (2x), cast stones at them (2x), slay them (2x), of old (2x), ye talk (2x)  
 nonchiastic elements: we would not have (2x), time (2x)  
 source: Parry, p. 370

**Appendix H:** [back to Edwards p. 123](#)

**Eight-Element Opportunities in the Book of Mormon**

**Line 7.** Examination of two chapters in the Book of Mormon (1 Nephi 1 and Moroni 8) reveals three passages which, if reordered properly, would form simple eight-element chiasms. Since there are 239 chapters in the Book of Mormon, the estimated number of opportunities for simple eight-element structure in the book is  $N = 239 \times 3 / 2 = 359$ . This estimate is used above to calculate P for Alma 36 (Example 11).

1 Nephi 1:

Opportunity 1

2 Yea, **I make a record** in the **language** of my father, which consists of the learning of the Jews and the **language** of the Egyptians.  
 3 And I know that the **record which I make** is true; and **I make it** with mine own hand; and **I make it** according to my knowledge.  
 4 For it came to pass in the commencement of the first year of the reign of Zedekiah, king of Judah, (**my father, Lehi**, having dwelt **at Jerusalem** in all his days); and in that same year there came many prophets, prophesying unto the **people** that they must repent, or the great city **Jerusalem** must be destroyed.  
 5 Wherefore it came to pass that **my father, Lehi**, as he went forth **prayed unto the Lord**, yea, even with all his heart, in behalf of his **people**.  
 6 And it came to pass as he **prayed unto the Lord**, there came a pillar of fire and dwelt upon a rock before him; and **he saw and heard** much; and because of the things which **he saw and heard** he did quake and tremble exceedingly.

Moroni 8:

Opportunity 2

1 An epistle of my father Mormon, written to me, **Moroni**; and it was written unto me soon after my calling to the **ministry**. And on this wise did he write unto me, saying:

2 My beloved **son, Moroni**, I rejoice exceedingly that your Lord **Jesus** Christ hath been **mindful of you**, and hath called you to his **ministry**, and to his holy work.

3 I am **mindful of you** always in my prayers, continually praying unto God the Father in the **name** of his Holy Child, **Jesus**, that he, through his infinite goodness and grace, will keep you through the endurance of faith on his **name** to the end.

4 And now, my **son**, I speak unto you concerning that which **grieveth** me exceedingly; for it **grieveth** me that there should **disputations** arise among you.

5 For, if I have learned the truth, there have been **disputations** among you concerning the baptism of your little children.

Opportunity 3

23 But it is mockery before **God**, denying the mercies of Christ, and the power of his Holy Spirit, and putting trust in dead works.

24 **Behold, my son**, this thing ought not to be; for **repentance** is unto them that are under condemnation and under the curse of a broken law.

25 And the first fruits of **repentance** is **baptism**; and **baptism** cometh by faith unto **the fulfilling the commandments**; and **the fulfilling the commandments** bringeth **remission of sins**;

26 And the **remission of sins** bringeth **meekness, and lowliness of heart**; and because of **meekness and lowliness of heart** cometh the visitation of the Holy Ghost, which Comforter filleth with hope and perfect **love**, which **love** endureth by diligence unto prayer, until the end shall come, when all the saints shall dwell with **God**.

27 **Behold, my son**, I will write unto you again if I go not out soon against the Lamanites.

**Appendix I:** [back to Edwards p. 120](#)

### **Five-Element Opportunities in the Book of Mormon**

**Line 5.** Examination of two chapters in the Book of Mormon (1 Nephi 1 and Moroni 8) reveals eight passages which, if reordered properly, would form simple five-element chiasms. Since there are 239 chapters in the Book of Mormon, the estimated of number of opportunities for simple five-element structure in the book is  $N = 239 \times 4 = 956$ . This estimate is used above to determine the value of P for simple five-element chiasms in the Book of Mormon.

1 Nephi 1:

Opportunity 1

2 Yea, **I make a record** in the **language** of my father, which consists of the learning of the Jews and the **language** of the Egyptians.

3 And I know that the **record which I make** is true; and **I make it** with mine own hand; and **I make it** according to my knowledge.

4 For it came to pass in the commencement of the first year of the reign of Zedekiah, king of Judah, (**my father, Lehi**, having dwelt at **Jerusalem** in all his days); and in that same year there came many prophets, prophesying unto the people that they must repent, or the great city **Jerusalem** must be destroyed.

5 Wherefore it came to pass that **my father, Lehi**, as he went forth prayed unto the Lord, yea, even with all his heart, in behalf of his people.

#### Opportunity 2

6 And it came to pass as he prayed unto the Lord, there came a pillar of fire and dwelt upon a rock before him; and **he saw and heard** much; and because of the things which **he saw and heard** he did quake and tremble exceedingly.

7 And it came to pass that he returned to his own house at Jerusalem; and he cast himself upon his bed, being **overcome with the Spirit** and the things which **he had seen**.

8 And being thus **overcome with the Spirit**, he was carried away in a vision, even that he saw the **heavens** open, and he thought he saw **God** sitting upon his throne, surrounded with numberless concourses of angels in the attitude of singing and praising their **God**.

9 And it came to pass that **he saw** One descending out of the midst of **heaven**, and he beheld that his luster was above that of the sun at noon-day.

#### Opportunity 3

16 And now I, Nephi, **do not make a full account** of the things which my father hath written, for he **hath written many things** which he saw in visions and in dreams; and he also **hath written many things** which he prophesied and spake unto his children, of which I **shall not make a full account**.

17 But **I shall make an account** of my proceedings in my days. Behold, I make an **abridgment of the record of my father**, upon plates which I have made with **mine own** hands; wherefore, after I have **abridged the record of my father** then will **I make an account** of **mine own** life.

#### Moroni 8:

#### Opportunity 4

1 An epistle of my father Mormon, written to me, **Moroni**; and it was written unto me soon after my calling to the **ministry**. And on this wise did he write unto me, saying:

2 My beloved son, **Moroni**, I rejoice exceedingly that your Lord **Jesus** Christ hath been **mindful of you**, and hath called you to his **ministry**, and to his holy work.

3 I am **mindful of you** always in my prayers, continually praying unto God the Father in the **name** of his Holy Child, **Jesus**, that he, through his infinite goodness and grace, will keep you through the endurance of faith on his **name** to the end.

#### Opportunity 5

4 **And now, my son, I** speak unto you concerning that which **grieveth** me exceedingly; for it **grieveth** me that there should **disputations rise among you**.

5 For, if **I have learned** the truth, there have been **disputations among you** concerning the baptism of your little children.

6 **And now, my son, I** desire that ye should labor diligently, that this gross error should be removed from among you; for, for this intent I have written this epistle.

7 For immediately after **I had learned** these things of you I inquired **of the Lord** concerning the matter. And the word **of the Lord** came to me by the power of the Holy Ghost, saying:

#### Opportunity 6

15 For awful is the wickedness to suppose that **God** saveth one child because of **baptism**, and the other must perish because he hath no **baptism**.

16 Wo be unto them that shall pervert the ways of the Lord after this manner, for they shall perish except they repent. Behold, I speak with boldness, having authority from **God**; and I **fear** not what man can do; for **perfect love** casteth out all **fear**.

17 And I am filled with charity, which is everlasting **love**; wherefore, all **children** are alike unto me; wherefore, I **love** little **children** with a **perfect love**; and they are all alike and partakers of salvation.

#### Opportunity 7

18 For I know that **God** is not a partial **God**, neither a changeable being; but he is unchangeable from all **eternity** to all **eternity**.

19 **Little children** cannot repent; wherefore, it is awful wickedness to deny the pure **mercies of God** unto them, for they are all alive in him because of **his mercy**.

20 And he that saith that **little children** need baptism denieth the mercies of **Christ**, and setteth at naught the atonement of him and the power of his redemption.

21 Wo unto such, for they are in danger of death, hell, and an endless torment. I speak it boldly; God hath commanded me. Listen unto them and give heed, or they stand against you at the judgment-seat of **Christ**.

#### Opportunity 8

25 And the first fruits of repentance is **baptism**; and **baptism** cometh by faith unto the **fulfilling the commandments**; and the **fulfilling the commandments** bringeth **remission of sins**;

26 And the **remission of sins** bringeth **meekness, and lowliness of heart**; and because of **meekness and lowliness of heart** cometh the visitation of the Holy Ghost, which Comforter filleth with hope and perfect **love**, which **love** endureth by diligence unto prayer, until the end shall come, when all the saints shall dwell with God.

**Appendix J:** [back to Edwards p. 121](#)

### **Seven-Element Opportunities in the Pentateuch**

**Line 6.** Examination of Leviticus 25 reveals three passages which, if reordered properly, would form simple seven-element chiasms. This chapter occupies 2.7 pages in the 1979 edition of the King James Bible published by the Church of Jesus Christ of Latter-day Saints. The Pentateuch, the five books of Moses comprising the first five books in the Old Testament and the Jewish Torah, occupies 308 pages in this edition. Accordingly, the estimated number of opportunities for simple seven-element structure in the Pentateuch is  $N = 308 \times 3 / 2.7 = 342$ . This estimate is used above to determine P for Leviticus 24:13-23 (Example 10).

Leviticus 25:

Opportunity 1

3 **Six years** thou shalt **sow thy field**, and **six years** thou shalt **prune thy vineyard**, and **gather** in the fruit thereof;

4 But in the seventh **year** shall be a **sabbath of rest unto the land**, a **sabbath** for the LORD: thou shalt neither **sow thy field**, nor **prune thy vineyard**.

5 That which groweth of its own accord of thy harvest thou shalt not reap, neither **gather** the grapes of thy vine undressed: for it is a **year of rest unto the land**.

Opportunity 2

8 And thou shalt number **seven sabbaths of years** unto thee, **seven times seven years**; and the space of the **seven sabbaths of years** shall be unto thee **forty and nine years**.

9 Then shalt thou cause the **trumpet** of the **jubile** to **sound** on the tenth **day** of the seventh month, in the **day** of atonement shall ye make the **trumpet / sound / throughout all your land**.

10 And ye shall hallow the fiftieth year, and proclaim liberty **throughout all the land** unto all the inhabitants thereof: it shall be a **jubile** unto you; and **ye shall return every man** unto his possession, and **ye shall return every man** unto his family.

Opportunity 3

38 I am the LORD your **God**, which brought you **forth out of the land of Egypt**, to give you the land of Canaan, and to be your **God**.

39 And if thy brother that dwelleth by thee be waxen poor, and be **sold** unto thee; **thou shalt not** compel him to **serve** as a **bondservant**:

40 But as an hired **servant**, and as a sojourner, he shall be with thee, and shall **serve** thee unto the year of jubile:

41 And then shall he depart from thee, both he and his children with him, and shall return unto his own family, and unto the possession of his fathers shall he return.

42 For they are my **servants**, which I brought **forth out of the land of Egypt**: they shall not be **sold** as **bondmen**.

43 **Thou shalt not** rule over him with rigour;

**Appendix K:** [back to Edwards p. 114](#)

### **Objective Element Selection**

Objective selection of literary elements is crucial for valid statistical results, but requires restraint and thoroughness on the part of the analyst, who must both (a) find ties between elements that conform to some proposed chiasmic structure and (b) find ties with and between other elements that do not conform to this structure. Our selection rules provide a formalism that helps the analyst in this process.

Relaxing Rule 2, for example, by allowing synonyms to serve as element pairs, would increase the subjectivity of the element selection process, and would require extra care to ensure statistically reliable results. For example, D&C 112:9 can be rendered as (H.

Clay Gorton, *Language of the Lord: New Discoveries of Chiasma in the Doctrine and Covenants* Horizon, Bountiful, UT 1993, p. 83)

- (a) Thy **voice**
- (b) shall be a **rebuke** unto the *transgressor*;
- (b') and at thy **rebuke**
- (a') let the **tongue** of the *slanderer* cease its perverseness.

This structure contains a chiasmic element pair that violates Rule 2 (voice, tongue), a second chiasmic pair that obeys it (rebuke, rebuke), and a nonchiasmic pair that violates it (transgressor, slanderer). Relaxing Rule 2 by including such offending pairs could either raise or lower L, depending on the number of offending element pairs that are chiasmic. Relaxing Rule 2 would lead to statistically meaningless results unless the rule adopted in its place is restrictive enough to ensure that paired elements are associated strongly, and unless the rule adopted in place of Rule 2 is applied consistently in identifying both chiasmic and nonchiasmic elements. Such consistent application requires the analyst to overcome the subjective tendency to identify logical ties between element pairs that happen to conform to a proposed chiasmic structure (such as "voice" and "tongue" above), to ignore such ties between element pairs that do not conform to this structure (such as "transgressor" and "slanderer"), and to ignore extra appearances of chiasmic elements. We find considerable evidence of this subjectivity in the dozens of proposed chiasmic structures that we have examined during the course of our study. It is for this reason that we adopt a strict criterion for element pair selection (Rule 2) that helps to reduce this subjectivity.

Enforcing Rule 2 does not entirely eliminate subjectivity, especially the tendency to ignore nonchiasmic pairs of elements. In evaluating the significance of a nonchiasmic pair, we often find it useful to ask whether we would have included it had the passage been worded in such a way that the pair had been chiasmic. For example, had the word "hearts" first appeared between elements c and d in Mosiah 5:10-12 (Example 2), then the first and second appearances of this word would have conformed to the chiasmic structure, and one would naturally have included it in this structure, raising the number of chiasmic elements to eight. Since the element "hearts" would have been included in the chiasmic structure had this been possible, then this element must, by Rule 6, be accounted for in the analysis as a nonchiasmic element.

Rules 5 and 6 ensure that all appearances of all relevant elements are accounted for consistently in the statistical analysis. The same level of vigilance that is applied in identifying chiasmic elements must be applied in identifying extra appearances of chiasmic elements, and identifying appearances of nonchiasmic elements. Accounting for all such appearances is especially important to obtaining valid statistical results, because these appearances can greatly increase the likelihood that a particular chiasmic structure would emerge by chance, as is seen in the INFORMIX example (Example 4).

**Appendix L:** [back to Edwards p. 121](#)  
**Full Text of Alma 36**

We now present the complete text of Alma 36, organized according to the eight and ten element structures summarized in the text. Lower case labels (a), (b), etc. identify the chiastic sections of the eight-element structure, whereas upper case labels (A), (B), etc. identify the chiastic sections of the ten-element structure, with the principal elements of these sections in bold face. The extra appearance of (E) and the extra appearance of (I) are italicized. Numerals within square brackets indicate chapter verses:

(a, A) My son, give ear to my words; for I swear unto you, that **inasmuch as ye shall keep the commandments of God ye shall prosper in the land.** [1]

(b, B) I would that **ye should do as I have done, in remembering the captivity of our fathers;** [2]

(c, C) for **they were in bondage**, and none could deliver them except it was the **God of Abraham, and the God of Isaac, and the God of Jacob;** and **he surely did deliver them** in their afflictions. [2]

(d, D) And now, O my son Helaman, behold, thou art in thy youth, and therefore, I beseech of thee that thou wilt hear my words and learn of me; for I do know that **whosoever shall put their trust in God shall be supported in their trials, and their troubles, and their afflictions, and shall be lifted up at the last day.** [3]

(e, E) And I would not that ye think that **I know** of myself--not of the temporal but of the spiritual, not of the carnal mind but **of God.** (F) Now, behold, I say unto you, if I had not been **born of God** I should **not have known** these things; *(E) but God has, by the mouth of his holy angel, made these things known unto me, not of any worthiness of myself.* [4, 5]

(f, G) For I went about with the sons of Mosiah, seeking to destroy the church of God; but behold, God sent his holy angel to stop us by the way. And behold, he spake unto us, as it were the voice of thunder, and the whole earth did tremble beneath our feet; and we **all fell** to the earth, for the fear of the Lord came upon us. But behold, the voice said unto me: Arise. And **I arose and stood up**, and beheld the angel. And he said unto me: If thou wilt of thyself be destroyed, seek no more to destroy the church of God. And it came to pass that **I fell** to the earth; and it was for the space of three days and three nights that I could not open my mouth, **neither had I the use of my limbs.** And the angel spake more things unto me, which were heard by my brethren, but I did not hear them; for when I heard the words --If thou wilt be destroyed of thyself, seek no more to destroy the church of God -- I was struck with such great fear and amazement lest perhaps I should be destroyed, that **I fell** to the earth and I did hear no more. [6-11]

(g, I) *But I was racked with eternal torment, for my soul was **harrowed up to the greatest degree and racked with all my sins.** Yea, **I did remember all my sins and iniquities, for which I was tormented with the pains of hell; yea, I saw that I had rebelled against my God, and that I had not kept his holy commandments.** Yea, and I had murdered many of his children, or rather led them away unto destruction;* (H) yea, and in fine so great had been my iniquities, that the **very thought of coming into the presence of my God did rack my soul with inexpressible horror.** Oh, thought I, that I could be banished and become extinct both soul and body, that I might not be brought to stand in the **presence of my God,** to be judged of my deeds. (I) And now, for three days and for three nights was I racked, even with the pains of a damned soul. And it came to pass that as I was thus racked with torment, while **I was harrowed up by the memory of my many sins,** [12-17]

(h, J) behold, I remembered also to have heard my father prophesy unto the people concerning **the coming of one Jesus Christ, a Son of God, to atone for the sins of the world.** [17]

(h', J') Now, as my mind caught hold upon this thought, **I cried within my heart: O Jesus, thou Son of God, have mercy on me,** who am in the gall of bitterness, and am encircled about by the everlasting chains of death. [18]

(g', I') And now, behold, when I thought this, I could remember my pains no more; yea, I was **harrowed up by the memory of my sins no more.** And oh, what joy, and what marvelous light I did behold; yea, my soul was filled with joy as exceeding as was my pain! Yea, I say unto you, my son, that there could be nothing so exquisite and so bitter as were my pains. Yea, and again I say unto you, my son, that on the other hand, there can be nothing so exquisite and sweet as was my joy. (H') Yea, methought I saw, even as our father Lehi saw, God sitting upon his throne, surrounded with numberless concourses of angels, in the attitude of singing and praising their God; yea, and **my soul did long to be there.** [19-22]

(f', G') But behold, my **limbs did receive their strength again,** and **I stood** upon my feet, [23]

(e', F') and **did manifest unto the people that I had been born of God.** Yea, and from that time even until now, I have labored without ceasing, that I might bring souls unto repentance; that I might bring them to taste of the exceeding joy of which I did taste; **that they might also be born of God,** and be filled with the Holy Ghost. Yea, and now behold, O my son, the Lord doth give me exceedingly great joy in the fruit of my labors; **For because of the word which he has imparted unto me, behold, many have been born of God,** and have tasted as I have tasted, and have seen eye to eye as I have seen; (E') therefore they do know of these things of which I have spoken, as I do know; and **the knowledge which I have is of God.** [23-26]

(d', D') And **I have been supported under trials and troubles of every kind, yea, and in all manner of afflictions**; yea, God has delivered me from prison, and from bonds, and from death; yea, and **I do put my trust in him**, and he will still deliver me. And I know that he will **raise me up at the last day**, to dwell with him in glory; [27-28]

(c', C') yea, and I will praise him forever, for **he** has brought our fathers out of Egypt, and he has swallowed up the Egyptians in the Red Sea; and he led them by his power into the promised land; yea, and he has **delivered them out of bondage** and captivity from time to time. Yea, and **he** has also brought our fathers out of the land of Jerusalem; and he has also, by his everlasting power, **delivered them out of bondage** and captivity, from time to time even down to the present day; [28-29]

(b', B') and **I have always retained in remembrance their captivity**; yea, and **ye also ought to retain in remembrance, as I have done, their captivity**. [29]

(a', A') But behold, my son, this is not all; for ye ought to know as I do know that **inasmuch as ye shall keep the commandments of God ye shall prosper in the land**; and ye ought to know also, that inasmuch as ye will not keep the commandments of God ye shall be cut off from his presence. Now this is according to his word. [30]