Type: Journal Article

Comparing Book of Mormon Names with Those Found in J.R.R. Tolkien's Works: An Exploratory Study

Author(s): Brad Wilcox, Wendy Baker-Smemoe, Bruce L. Brown, and Sharon Black
Source: *Interpreter: A Journal of Mormon Scripture*, Volume 30 (2018), pp. 105-124
Published by: The Interpreter Foundation

Abstract: The works of Tolkien and the Book of Mormon have been compared in a variety of ways by multiple authors and researchers, but none have looked specifically at the unusual names found within both. Wordprint studies are one tool used in author attribution research, but do authors use specific sounds more than others — consciously or subconsciously — when selecting or inventing names? Some research suggests they may and that their patterns could create a "sound print" or phonoprint. This constitutes a fresh and unusual path of research that deserves more attention. The purpose of this exploratory study was to see if phonoprints surfaced when examining Dwarf, Elf, Hobbit, Man, and other names created by Tolkien and Jaredite, Nephite, Mulekite, and Lamanite names found in the Book of Mormon. Results suggest that Tolkien had a phonoprint he was unable to entirely escape when creating character names, even when he claimed he based them on distinct languages. In contrast, in Book of Mormon names, a single author's phonoprint did not emerge. Names varied by group in the way one would expect authentic names from different cultures to vary. Although much more research needs to be done to establish the validity and reliability of using phonoprints for author identification, this study opens a door for future research.

INTERPRETER

A Journal of Mormon Scripture

Volume 30· 2018 · Pages 105 - 124

Comparing Book of Mormon Names with Those Found in J.R.R. Tolkien's Works: An Exploratory Study

Brad Wilcox, Wendy Baker-Smemoe, Bruce L. Brown, and Sharon Black

Offprint Series

ISSN 2372-1227 (print)
ISSN 2372-126X (online)

The goal of The Interpreter Foundation is to increase understanding of scripture through careful scholarly investigation and analysis of the insights provided by a wide range of ancillary disciplines, including language, history, archaeology, literature, culture, ethnohistory, art, geography, law, politics, philosophy, etc. Interpreter will also publish articles advocating the authenticity and historicity of LDS scripture and the Restoration, along with scholarly responses to critics of the LDS faith. We hope to illuminate, by study and faith, the eternal spiritual message of the scriptures—that Jesus is the Christ.

Although the Board fully supports the goals and teachings of the Church, The Interpreter Foundation is an independent entity and is neither owned, controlled by nor affiliated with The Church of Jesus Christ of Latter-day Saints, or with Brigham Young University. All research and opinions provided are the sole responsibility of their respective authors, and should not be interpreted as the opinions of the Board, nor as official statements of LDS doctrine, belief or practice.

This journal is a weekly publication of the Interpreter Foundation, a non-profit organization located at InterpreterFoundation.org. You can find other articles published in our journal at MormonInterpreter.com. You may subscribe to this journal at MormonInterpreter.com/annual-print-subscription.

Comparing Book of Mormon Names with Those Found in J.R.R. Tolkien's Works: An Exploratory Study

Brad Wilcox, Wendy Baker-Smemoe, Bruce L. Brown, and Sharon Black

Abstract: *The works of Tolkien and the Book of Mormon have been compared in a variety of ways by multiple authors and researches, but none have looked specifically at the unusual names found within both. Wordprint studies are one tool used in author attribution research, but do authors use specific sounds more than others — consciously or subconsciously — when selecting or inventing names? Some research suggests they may and that their patterns could create a "sound print" or phonoprint. This constitutes a fresh and unusual path of research that deserves more attention. The purpose of this exploratory study was to see if phonoprints surfaced when examining Dwarf, Elf, Hobbit, Man, and other names created by Tolkien and Jaredite, Nephite, Mulekite, and Lamanite names found in the Book of Mormon. Results suggest that Tolkien had a phonoprint he was unable to entirely escape when creating character names, even when he claimed he based them on distinct languages. In contrast, in Book of Mormon names, a single author's phonoprint did not emerge. Names varied by group in the way one would expect authentic names from different cultures to vary. Although much more research needs to be done to establish the validity and reliability of using phonoprints for author identification, this study opens a door for future research.*

One of the unexplained mysteries of the world is the Voynich Manuscript,[1] a 240-page, richly illustrated book, carbon dated to the

1. "17 Unexplained Mysteries of the World That Remain Unsolved," *Entertainment, Movies and Gaming Network*, accessed September 1, 2018, http://

14th or 15th century, written in characters a virtual army of worldwide linguists and code breakers have been unable to translate. It is considered by scholars to be either a real language or a skillfully invented language that has characters grouped with the appearance of forming words.[2] Its origin is unknown. It belonged at one time to Emperor Rudolph II of Germany (1576–1612), who thought it to be the work of Roger Bacon, an English Franciscan friar and philosopher (1219–1292),[3] though this has been overridden by a number of analyses.[4] The book is now housed in the Beinecke Library at Yale University.

Linguistic Analyses

Although no one has been able to interpret its characters or discern whether there is any meaning to its text,[5] extensive linguistic analyses of the Voynich Manuscript have been made. A statistical study of the word equivalents claimed that the text adheres to linguistic rules.[6] Jorge Stolfi, who dealt with such rules, designated *core*, *mantle*, and *crust* characters.[7] German and Latin influences have been found, and some scholars have suggested that the manuscript might represent collaboration between individuals from Italy and Germany.[8] After years of analyzing patterns in the linguistics of the manuscript, Marcelo Montemurro, a theoretical physicist from the

---

emgn.com/entertainment/17-unexplained-mysteries-of-the-world-that-remain-unsolved/.

2. Megan Gannon, "10 Words in Mysterious Voynich Manuscript Decoded," *LiveScience*, February 20, 2014, http://www.livescience.com/43542-voynich-manuscript-10-words-cracked.html.

3. "Voynich Manuscript: A Mysterious, Undeciphered Manuscript Dating to the 15th or 16th Century," *Beinecke Rare Book & Manuscript Library* (website), accessed September 1, 2018, http://beinecke.library.yale.edu/collections/highlights/voynich-manuscript.

4. René Zandbergen, "Text Analysis," *Voynich Manuscript* (website), last updated May 26, 2018, http://www.voynich.nu/analysis.html.

5. René Zandbergen, "Text Analysis — Transcription of the Text," *Voynich Manuscript* (website), last updated February 2, 2018, http://www.voynich.nu/transcr.html.

6. Gannon, "10 Words in Mysterious Voynich Manuscript Decoded".

7. Jorge Stolfi, "A Grammar for Voynichese Words," *Instituto De Computacao* (website), last edited June 14, 2000, http://www.ic.unicamp.br/~stolfi/voynich/00-06-07-word-grammar/.

8. Prescott Currier, "The Voynich Manuscript: Some Notes and Observations" (Seminar, New Research on the Voynich Manuscript, Washington, D.C., November 30, 1976), https://www.nsa.gov/news-features/declassified-documents/voynich/assets/files/proceedings-of-a-seminar-30-november-1976.pdf.

University of Manchester, UK, and a colleague used computerized statistical methods to find "semantic networks" which appeared to them to be clustered patterns of content-bearing words, with new word structures indicating a shift in topic.[9] Linguist Prescott Currier has found two different writing styles and text properties, thus being able to conclude that whatever it might say in whatever language, it is co-authored.[10]

If linguists can make fascinating analyses of unknown languages and communication systems in the Voynich Manuscript, then the Book of Mormon seems to open itself to similar investigation. Readers who believe the Book of Mormon claim it was translated from an ancient record represented in characters that no one but a prophet with divine intervention could be able to read. Other manuscripts that invite linguistic exploration are the works of J. R. R. Tolkien. He created worlds, cultures, and characters based on languages he invented himself.

Tolkien was a brilliant linguistics scholar who had mastered thirteen languages (ancient and modern) and had a working knowledge[11] of nine more; he invented imaginary languages in his spare time, having started this practice as a child. He knew how to create linguistic systems. Fortunately, he didn't want his works to be unreadable like the Voynich book; the stories are told in English.

At the time the Book of Mormon was published, Joseph Smith had about a third or fourth grade education and no knowledge of languages or linguistics. He never claimed to have created the Book of Mormon — its people, its cultures, or the languages from which it was derived. He explained that he had translated an ancient record into English by the gift and power of God.

Purpose of the Study

One element *The Lord of the Rings* and the Book of Mormon have in common are hundreds of unusual, striking names. Tolkien created his names while Joseph Smith maintained the names in the Book of Mormon are authentic. Peter A. Huff (not a Latter-day Saint), referred to the Book of Mormon as "an extraordinary piece of literature" comparable to

9. Marcelo A. Montemurro, "Mysterious Voynich Manuscript Has 'Genuine Message'," interviewed by Melissa Hogenboom, *BBC News*, June 22, 2013, www.bbc.com/news/science-environment-22975809.

10. Currier, "The Voynich Manuscript: Some Notes and Observations".

11. Calvin George, "J. R. R. Tolkien's Linguistic Foundation for Middle Earth," *Thought Hub*, September 22, 2015, http://www.sagu.edu/thoughthub/j-r-r-tolkien-s-linguistic-foundation-for-middle-earth.

Tolkien's *The Lord of the Rings*.[12] Although he is not the first or only person to compare the two works, the purpose of this study was to explore Huff's analogy by looking closely at the names contained in both volumes.

Authentic personal names are derived from many different sources; few parents choose their children's names according to linguistic forms and codes. In contrast, fictional names in creative works come primarily from one source, the author, and they are usually carefully and purposefully chosen or invented. Although Joseph Smith maintained he translated the Book of Mormon from an ancient record, critics claim he wrote it as any author writes a fictional work. If these critics are correct, he would have presumably chosen or created the names as fiction writers do.

Background

To examine and compare names from these two sources, we need to consider differences between authentic and fictional names in general as well as some background concerning names of Tolkien's characters and names in the Book of Mormon.

Authentic Names

Personal names have cultural significance. Some societies use personal names to teach culturally important lessons or remind their owners of significant events. In other societies names can reflect social or financial position or incidents surrounding a child's birth.[13] Additional reasons for choosing names, at least historically, include naming a child with hoped-for characteristics,[14] focusing on the location of the birth,[15] or alluding to the occupations of parents.[16]

Today, with the interaction of many different cultures and peoples, personal names may derive from multiple languages and origins.[17] Many people have a surname from the culture in which they reside and a given

12. Peter A. Huff, "A Gentile Recommends the Book of Mormon," *Dialogue: A Journal of Mormon Thought* 43, no. 2 (Summer 2010): 209–10.

13. Susan M. Suzman, "Names as Pointers: Zulu Personal Naming Practices," *Language in Society* 23 (June 1994): 253–72.

14. Francisco J. Rubio Orecilla, "Celtic Kuono in Hispano-Celtic Personal Names," *Beitrage zur Namenforschung* 41 (2006): 399–410.

15. Walter Wenzel, "Interrelations Between Lower Lusatian Place-Names and Personal Names," *Onoma* 36 (2001): 165–79.

16. Kirsi-Maria Nummila, "Occupational Designations Derived from Nouns + (uri) Among Our Personal Names," *Virittaja* 111 (2007): 543–66, https://journal.fi/virittaja/article/view/40614/10040.

17. Artur Lamaj and Valter Memishaj, "The Use of Personal Names in Albanian," *Cahiers Balkaniques* 32 (2001): 31–37; see also Isabelle Leglise and

name chosen from the native language of the parents.[18] In Western societies given names can derive from circumstances such as invasions of or trading with other cultures,[19] conversions to Christianity,[20] pagan mythology,[21] or outright coinage.[22]

Regardless of the origins of names, their phonological features evolve over time. Names are shortened, combined, or spelled with variant letters until the same names can differ significantly.[23] The phonology of names may have personal as well as social significance. Native English speakers prefer, for example, female names that follow specific features (like ending in /i/ as in *Debbi* or /n/ as in *Sharon*) and male names that follow others (some ending in /r/ as in *Brenner* or in obstruents as in *Brad*); names will change or fall out of favor if they do not follow these features (such as *Ashley* and *Whitney* changing from boys' to girls' names). Other cultures prefer to keep the exact or very similar phonology to the pronunciation of the name in the borrowed language, even if it violates native language phonotactics.[24]

In previous research, the authors studied the degree to which personal names differ in their phonology by examining a corpus of the 100 most prevalent male personal names in English in the 19th century,

---

Bettina Migge, "Language-Naming Practices, Ideologies, and Linguistic Practices: Toward a Comprehensive Description of Language Varieties," *Language in Society* 35 (2006): 313–39.

18. Michael Aceto, "Ethnic Personal Names and Multiple Identities in Anglophone Caribbean Speech Communities in Latin America," *Language and Society* 31 (2002): 577–608.

19. Freya Verstraten, "Naming Practices Among the Irish Secular Nobility in the High Middle Ages," *Journal of Medieval History* 32 (2006): 43–53.

20. Pavel Stefanov, "Bulgarian Personal Names of Romanian Origin in a Manuscript from 1720," *Spostavitelno Ezikoznaie/Contrastive Linguistics* 16 (1991): 27–30.

21. Aleksandra V. Superanskaya, "Russian Personal Names," *Folia Onomastica Croatica* 8 (1999): 191–200.

22. Betsy Rymes, "Naming as Social Practice: The Case of Little Creeper from Diamond Street," *Language in Society* 25 (June 1996): 237–60.

23. Julie F. Nemer, "Phonological Stereotypes and Names in Temne," *Language in Society* 16 (September 1987): 341–52.

24. Carol Hough, "Towards an Explanation of Phonetic Differentiation in Masculine and Feminine Personal Names," *Journal of Linguistics* 36 (March 2000): 1–11.

using the *phonotactic calculator*[25] created by Vitevitch and Luce.[26] This calculator determines the relative probability of each phoneme in a word occurring in the location that it does and also the probability of its occurring adjacent to the preceding and following sounds in the word (bifones or bi-phonemes as defined by Vitevitch and Luce). In addition, a word's probability is determined by examining its neighborhood density. Words with many phonological neighbors (*cap*, *cat*, *can*, *cash*) score higher on the probability calculator than words with few neighbors (*oriole*, *flask*, etc.). The calculator determines neighborhood density and sound location probability by comparing a selected word to calculations already performed on a corpus of English created by Kucera and Francis.[27] For example, in the word *box (*/baks/*),* the calculator would determine how probable it is that a word would start with the sound /b/ and be followed by the sound /a/ in the second position, how likely a word would have /a/ in the second position and have the sound /k/ following it, and so on. We found that phonotactic probabilities of the names in the census varied greatly.

In addition to varying at the sound level, personal names also differ when they are examined as whole units. When people buy plane tickets, their names are examined by name recognition software that searches for matches with names on no-fly lists but also identifies the background of the names with amazing accuracy by comparing them to databases containing millions of names.[28]

Thus personal names come from a variety of sources, vary in their phonological features and properties, and vary when considered as whole units in comparisons such as databases. In considering the names created by Tolkien and the names in the Book of Mormon, we asked if a writer of fiction creating all the names in a novel could replicate this

25. Brad Wilcox, et al., "Identifying Authors by Phonoprints in Their Characters' Names: An Exploratory Study," *Names: A Journal of Onomastics* 61 (June 2013): 104–25.

26. Michael Vitevitch and Paul A. Luce, "A Web-Based Interface to Calculate Phonotactic Probability for Words and Nonwords in English," *Behavior Research Methods, Instruments, & Computers* 36 (2004): 481–87.

27. Henry Kucera, W. Nelson Francis, and John B. Carroll, *Computational Analysis of Present-day American English* (Providence, RI: Brown University Press, 1967).

28. "Overview of IBM InfoSphere Global Name Recognition," IBM Knowledge Center, accessed September 1, 2018, https://www.ibm.com/support/knowledgecenter/en/SSEV5M_4.2.0/com.ibm.iis.gnm.overview.doc/topics/gnr_gnm_con_gnmoverview.html.

variety: if one author could imitate the diversity found in a corpus of personal names from actual languages — past or present.

Names in Fiction

Some authors choose to name their characters using authentic names they have encountered in experience; found on internet lists; or noticed consulting newspapers, telephone directories, road signs, or tombstones.[29] Others invent unique names — especially when they create fantasy or science fiction. Sometimes these supposedly come from languages unknown to us or from worlds beyond our own. Drawn from authentic sources or invented, names used by authors of fiction are chosen to match the personality of the character or to bring up stereotypes or archetypes.[30] When interviewed about their methods of choosing names for their fictional characters, successful authors spoke of choosing names that held personal significance for them, doing research to find names that were unusual or represented a particular time period or culture, and choosing names with phonology that appealed to them or would possibly appeal to potential readers.[31]

Scholars who have studied the Voynich Manuscript over the years cannot identify the language (or code) in which it is written and can hazard guesses at content only from the illustrations. But as noted previously, they have been able to identify aspects of the authors' time period and nationality from the way the characters are grouped as words and what appear to be paragraphs — although they have no idea the sounds the characters and groupings might have made. They have even reconstructed linguistic rules and grammar from statistical analysis. One analyst claims to have figured out the meanings of 10 of the document's words using linguistics, grammar, and repetition patterns.[32]

Similarly, research has demonstrated that authors writing in English or other known languages have individual biases toward using specific words and syntactic structures when they write. Their choices constitute

29. Sharon Black and Brad Wilcox, "188 Unexplainable Names: Book of Mormon Names No Fiction Writer Would Choose," *Religious Educator* 12, no. 2 (2011): 119–30.

30. Innocentia J. Mhlambi, "Acts of Naming: The Detective Plot in Masondo's Fiction," *South African Journal of African Languages* 27 (2007): 128–41.

31. Sharon Black and Brad Wilcox, "Sense and Serendipity: Some Ways Fiction Writers Choose Names," *Names: A Journal of Onomastics* 59, no. 3 (September 2011): 152–63.

32. Gannon, "10 Words in Mysterious Voynich Manuscript Decoded."

a "wordprint" (similar to but not as precise as a fingerprint) by which they can be identified.[33]

Some criticize this technique because collecting sufficient data is usually difficult.[34] Nevertheless, this method of examining an author's use of specific syntactic structures, type-token ratios, and other lexical features has been used regularly to identify or verify authorship of documents.[35] In fact, some scholars claim authors can be identified based on their use of function words alone (e.g., *then*, *why*, *the*, *if*, *of*, *but*, *have*, etc.).[36] Others have successfully verified or ruled out authorship on writing elements as simple as cross-textual comparisons of style markers such as variant forms of punctuation and spelling.[37] Scholars of the Voynich Manuscript were able to eliminate Roger Bacon as a possible author because no trace of an English wordprint emerged in their analysis.[38]

An aspect of wordprints that has not been examined sufficiently in author attribution research is whether authors use some specific sounds (phonemes) more than others — consciously or subconsciously — when selecting or inventing names. Some research suggests they might do this and that their patterns may create a "sound print" or phonoprint.[39] This constitutes a fresh and unusual path of research that may merit more examination. Traditionally, words have been seen as the smallest building blocks over which authors have some freedom to choose. This new line

33. Jack Grieve, "Quantitative Authorship Attribution: An Evaluation of Techniques," *Literary and Linguistic Computing* 22, no. 3 (2007): 251–70; see also John L. Hilton, "On Verifying Wordprint Studies: Book of Mormon Authorship," *BYU Studies* 30, no. 3 (1990): 89–108; see also Andrew Q. Morton, *Literary Detection: How to Prove Authorship and Fraud in Literature and Documents* (New York: Scribner, 1978).

34. D. James Croft, "Book of Mormon 'Wordprints' Reexamined," *Sunstone* 6, no. 2 (March 1981): 15–22.

35. David I. Holmes, "Authorship Attribution," *Computers and the Humanities* 28, no. 2 (April 1994): 87–106; see also Farkhund Iqbal, et al., "E-mail Verification of Forensic Investigation," *(25th ACM SIGAPP Symposium on Applied Computing* Sierre, Switzerland: ACM Press, 2010), 1591–98.

36. Antonio Miranda-Garcia and Javier Calle-Martin, "Function Words in Authorship Attribution Studies," *Literacy and Linguistic Computing* 22 (March 2006): 49–66.

37. Ben Zimmer, "Decoding Your E-mail Personality," *New York Times*, July 23, 2011, http://www.nytimes.com/2011/07/24/opinion/sunday/24gray.html.

38. René Zandbergen, "History of research of the Voynich MS," *Voynich Manuscript* (website), last updated March 9, 2018, http://www.voynich.nu/solvers.html.

39. Brad Wilcox, et al., "Identifying Authors by Phonoprints in Their Characters' Names: An Exploratory Study," 104–25.

of research expands the fundamental unit of text into phonemes and proposes the possibility that we could produce a phonoprint that would differ from author to author. Despite that authors have fewer sounds with which to create words than they have words with which to create prose and poetry, there is some evidence that authors favor certain sounds over others when choosing or inventing names.[40] We recognize that much more research will need to be completed to establish a baseline with which valid and reliable comparisons can be made. Many works of fiction by a variety of authors will need to be examined. Nevertheless, this exploratory study was completed to see if further research might be justified.

Tolkien's Character Names

As Tolkien, a professor of Anglo-Saxon at Oxford, created languages based on some characteristics of natural languages, he deliberately used different sound systems for each of them, and he particularly enjoyed the names that evolved from these systems. He commented during a BBC radio interview that a "good name" gave him "great pleasure." Although Tolkien claimed his names came from invented or ancient languages, sometimes he selected names already existing in Icelandic poems like Voluspa and Gylfaginning. For example, of the 13 dwarves' names in Thorin's company in *The Hobbit*, 12 come right out of Voluspa. Tolkien simply used the traditional Anglicization of the names. Other names are recognizable surnames in Great Britain such as Meriadoc and Faldor.

Tolkien once said that he sometimes started with a name: "Give me a name and it produces a story, not the other way about normally."[41] Sometimes he claimed his character names followed the patterns of invented languages, including phonotactics, and of the cultures he created for them. Other times he used names found in mythic poetry or his own experience.

Whatever the source of Tolkien's names, this study analyzed character names from five different languages groups selected or created by Tolkien (elf, man, dwarf, hobbit, other). As few surnames or titles appear in the text, only first names were included. Names given to two or more characters were used only once. Of the 197 names found in

40. See Sharon Black, et al., "Absence of 'Joseph Smith' in the Book of Mormon: Lack of the Name Letter Effect in Nephite, Lamanite, and Jaredite Names," *Religious Educator* 17, no. 2 (2016): 37–55; see also Brad Wilcox, et al., "Identifying Authors by Phonoprints in Their Characters' Names: An Exploratory Study," 104–25.

41. J. R. R. Tolkien, interview by Dennis Gerrolt, *Now Read On*, BBC, January 1971, https://www.realmofhistory.com/2017/10/28/rare-extended-edition-tolkien-bbc-interview/.

Tolkien's writings, 14 were discarded because they were names of beings for whom there were only a few representatives (dogs, ravens, goblins, etc.). Therefore, 183 names were used in the final analysis.[42]

Book of Mormon Names

The Book of Mormon includes 337 proper names and 21 gentilics (analogous forms), with 188 of them found in no other source. Joseph Smith purported that the large number of Book of Mormon names represent a diversity of cultures in ancient America (e.g., Jaredites, Nephites, Mulekites, Lamanites) and thus the names were derived from the language backgrounds of these cultures, which included Egyptian, Hebrew, and other Semitic languages. (Joseph Smith had no knowledge of or experience with any of them at the time the Book of Mormon was produced, although he studied Hebrew later in his life.) Of the 337 proper names in the book of Mormon, 149 are found in the Bible as well (e.g., Samuel, Isaiah, Gideon, Benjamin, Aaron, Noah, Shem, Timothy, and Jacob) and thus were excluded from this study.[43] When place names were also excluded, 162 unique names remain as those of people. Of these, 32 could not be clearly classified by culture, so they were not used in this study. This elimination left 130 single names without ranks or titles: "Typical of the ancient Semitic languages from which the Nephite record is [said to have been] derived, the Book of Mormon does not use surnames or attach modern titles to its names such as … Professor, Reverend, Count or Earl."[44]

Of the unique names in the Book of Mormon, 41 are mentioned only once. In contrast, the most prominent names are given often, some of them assigned to multiple characters — particularly descendants of the first recorded character with that name (e.g., Nephi, Helaman, Laman, Moroni, and Zoram). Nephi is mentioned 77 times, the unique name

42. "Characters," One Ring to Rule Them All: The Lord of the Rings Wiki, *Fandom*, last modified September 1, 2018, http://lotr.wikia.com/wiki/Category:Characters. See also *The Encyclopedia of ARDA: An Interactive Guide to the Works of J.R.R Tolkien* (website), Glyphweb, accessed September 1, 2018, http://www.glyphweb.com/arda/.

43. Paul Y. Hoskisson, "An Introduction to the Relevance of and a Methodology or a Study of the Proper Names of the Book of Mormon," in *By Study and Also by Faith*, ed. John Lundquist and Shirley Ricks (Provo, UT: FARMS, 1990), 2:126–35.

44. Donald W. Parry, "The Book of Mormon: Integrity and Internal Consistency," in *Expressions of Faith: Testimonies of Latter-day Saint Scholars*, ed. Susan Easton Black (Salt Lake City: Deseret Book, 1996), 211, https://publications.mi.byu.edu/fullscreen/?pub=1127&index=22.

represented most frequently. Ammon appears in 51 references, and Moroni is mentioned 44 times.[45] Name pronunciations and spellings in this study were consistent with Skousen's work with the original manuscript.[46] Table 1 presents characteristics of names in the four Book of Mormon groups and the five Tolkien groups including the longest and shortest names in each group.

Table 1. Characteristics of the Names: the Four Book of Mormon Groups and the Five Tolkien Groups.

Name Group	Number	Longest Name(s)	Shortest Name(s)
Book of Mormon Names	130		
Jaredite	34	Coriantumr (10 phonemes)	Ahah, Com, Emer, Ether, Kib, Kim, Kish, Lib, Omer, Shez, Shiz (3 phonemes)
Nephite	82	Kumenonhi (10)	Aha, Ammah, Gid (3)
Mulekite	6	Zarahemla (9)	Hem (3)
Lamanite	8	Zarahemnah, Zemnarihah (9)	Laman (5)
Tolkien names	183		
Dwarf	23	Azaghal, Dwalin, Faldor (6)	Oin (2)
Elf	47	Celebrimbor (11)	Osse (2)
Hobbit	18	Bandobras (10)	Bob (3)
Man	74	Bladothin, Ghan-Buri-Ghan (9)	Bill, Bor, Tom (3)
Other	21	Bregalad, Shadowfax, Skinbark (8)	Arod, Arroch, Azag (4)

45. It would be interesting to do a statistical study on the prevalence distribution of names within the text to see the probabilistic distribution they follow and how that compares to the probabilistic distribution found within fiction and records of authentic names, but this was not done at this time.

46. Royal Skousen, *The Book of Mormon: The Earliest Text* (New Haven, CT: Yale University Press, 2009).

Methods and Results

Given the exploratory nature of this study, we performed only two analyses to compare these two name sources in both consistency and variety of names. We included phonotactic probabilities and identification by language recognition software.

Phonotactic Probabilities

Our first analysis examined 313 names, 183 from Tolkien and 130 from the Book of Mormon, to determine how much the five groups of Tolkien names differed from one another in their phonotactic probabilities in comparison with the four groups of Book of Mormon names. The phonotactic probability calculator developed by Vitevitch and Luce, which is available online, provides probabilities by comparing the phonemes in each ordinal position of a given word to the standard American English frequencies.

Klattese, a computer-readable transcription method developed by Dennis Klatt, was used to enter each name phonemically into the calculator.

We examined individual phonemes because some vowel sounds in English, /ĭ/ and /ī/ for example, are more common than diphthongs such as /ai/ or /oi/. Similarly, the consonant sounds /l/, /t/, /k/, and /n/ are more common than /j/ or /w/. We also looked at sequences of phonemes (bifones). The calculator gives probabilities of co-occurrence of phonemes: how frequently two given phonemes occur next to one another. For example, /bi/ occurs less frequently in standard American English than /br/.

In addition to phonemes and bifones, we examined overall word probabilities, which are also provided by the calculator. We emphasize that the phonotactic probability of an entire name doesn't reflect how often the name is used but how English-like it is. For example, regardless of how often the names Bilbo and Frodo appear in Tolkien's works, the average phonotactic probability of Frodo is lower (.0433) than that of Bilbo (.0518). We also emphasize that the purpose of the study was not to determine how English-like these names were. Rather, the phonotactic probabilities were used as a way to make quantitative comparisons between the names and examine the differences.

A nested two-way MANOVA was used to examine the overall difference between the two name sources, which was not significant, and also the differences among the name groups within each source, which were significant almost entirely due to differences in mean word length.

Dwarf names are shorter than other Tolkien names, and Jaredite names are shorter than other Book of Mormon names.

There were notable differences among the groups in their variety of name lengths, phoneme probabilities, and bifone probabilities. The Book of Mormon name groups have much greater in-group divergence than Tolkien names, which are more homogeneous. In this study we examined the nine name groups and differences are apparent between Tolkien names and Book of Mormon names — especially Jaradite names — which would be expected when comparing any two distinct sources.

The within-source comparisons, the language groups within each book, reveal additional differences between the texts. Although Tolkien claimed his character names were primarily based on different languages — real or invented — the phonotactic probabilities did not differ significantly. In the within-source comparisons among the five Tolkien languages, only one of the 10 language group comparisons (10%) is statistically significant (man versus elf). Among the four Book of Mormon name groups, four of the six variance ratios (67%) were significant (Nephite versus Jaredite; Mulekite versus Jaredite, Lamanite versus Jaredite, and Lamanite versus Nephite).

Results, shown in Table 2, present the averages of overall name probabilities of phonemes and bifones for the Book of Mormon and for Tolkien as well as the average word lengths for each.

Table 2. Average Phoneme and Bifone Probabilities and Word Lengths of the Names in the Four Book of Mormon Groups Compared to the Names in the Five Tolkien Groups.

Name Group	Average Phoneme Probabilities	Range of Phoneme Probabilies	Average Bifone Probabilities	Range of Bifone Probabilities	Average Word Length
Book of Mormon Names					
Jaredite	0.0426	Ether (.0050) to Kim (.0794)	0.0037	Ahah (.0000) to Moron (.0146)	5.059
Nephite	0.0435	Aha (.0082) to Corianton (.0731)	0.0034	Aha (.0000) to Manti (.0103)	6.28

Name Group	Average Phoneme Probabilities	Range of Phoneme Probabilities	Average Bifone Probabilities	Range of Bifone Probabilities	Average Word Length
Mulekite	0.0371	Muloch (.02764) to Hem (.0539)	0.0023	Muloch (.0005) to Hem (.0044)	5.667
Lamanite	0.0405	Tubaloth (.0334) to Laman (.0540).	0.0024	Zemnariah (.0014) to Antiomno (.0031)	7.125
Tolkien Names					
Dwarf	0.046	Azaghal (.0174) to Balin (.0618)	0.0038	Oin (.0001) to Nori (.0094)	4.348
Elf	0.044	Osse (.0122) to Sauron (.0792)	0.0032	Ingwe (.0004) to Indis (.0126)	6.191
Hobbit	0.0415	Angbor (.0203) to Peregrin (.0654)	0.003	Bungo (.0010) to Barliman (.0060)	6.222
Man	0.0429	Olwe (.0184) to Bill (.0737)	0.0036	Olwe (.0003) to Saruman (.0101)	6.203
Other	0.0381	Azag (.0098) to Felarof (.0566)	0.0024	Azag (.0002) to Wandlimb (.0052)	6.095

The between-source comparisons and the within-source comparisons for bifones showed a similar pattern to the phonemes, but the contrast between the Tolkien name groups and the Book of Mormon name groups was not as strong.

Language Recognition Software

The second analysis utilized language identification software. The first analyses focused on word parts — sounds and sound combinations. In this examination we looked at words as whole units, using IBM name recognition software to identify which languages seemed to be indicated

by each of the names. The classifier algorithm analyzes the spelling patterns in the names but also checks to see how closely they match IBM's archive of almost 800 million names. The software identification is based on modern languages, which are not relevant for this study since many of Tolkien's names are supposedly based on ancient languages and Book of Mormon believers claim that its names are also based on ancient languages. However, the software provides a "generic" response when a specific name shows no match with any known language.

Figure 1 gives a combined tabular and bar graph comparison of the number of generic and non-generic names for each name group, with their relative percentages. In Tolkien's works the highest percentage of generic names was 39.1% (Dwarfs), and the lowest percentage of generic names was 27.8% (Hobbits), a difference of 11.3%. In the Book of Mormon, the highest percentage of generic names was 50.0% (Mulekites), and the lowest was 20.0% (Jaredites), a difference of 30%. The chi square value for the Book of Mormon names was 5.189 with 3 degrees of freedom, and the chi square value for the Tolkien names was 0.850 with 4 degrees of freedom. Thus the Book of Mormon name groups were significantly more diverse than Tolkien's.

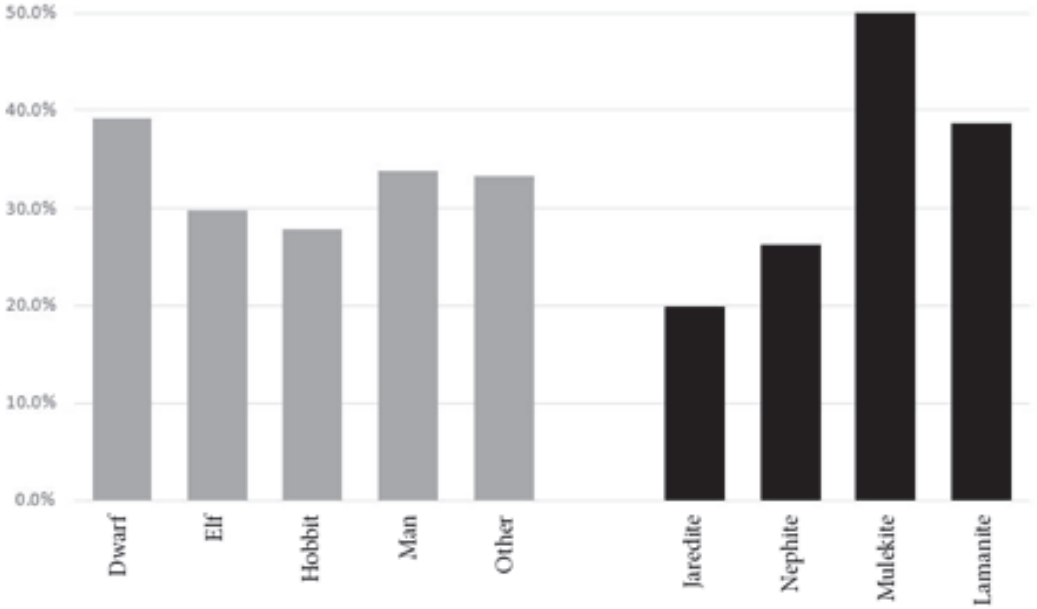
Discussion

Results suggest that Tolkien was unable to entirely escape his phonoprint when selecting or creating character names, even though he claimed he based them on or found them within distinct languages. The two analyses showed little differentiation involving his five major naming groups. A possible phonoprint of sorts seems to have surfaced in his names regardless of the language groups in which he placed them. This is consistent with the results of earlier research on Tolkien's possible phonoprint[47] and similar to the results from wordprint studies involving other authors of diverse characters such as Mark Twain. Even when Twain intentionally tried to create words (names) to represent different worlds, he was unable to change his own free-flow noncontextual word patterns successfully enough to simulate wordprints representing other peoples or cultures.[48]

47. Wendy Baker, et al., "Naming Practices in J. R. R. Tolkien's Invented Languages," *Journal of Literary Onomastics* 3, no. 1 (July 9, 2014): 5–23.

48. See John L. Hilton, "On Verifying Wordprint Studies: Book of Mormon Authorship," in *Book of Mormon Authorship Revisited: The Evidence for Ancient Origins*, ed. Noel B. Reynolds (Provo, UT: FARMS, 1997), 227–28.

Figure 1. Bargraphs with Accompanying Frequency Tables Comparing the Percent of Generic Names for the Five Groups of Tolkien Names and the Four Groups of Book of Mormon Names.



Five Tolkien Name Groups

	Generic	Not Generic	Percent Generic
Dwarf	9	14	39.1%
Elf	14	33	29.8%
Hobbit	5	13	27.8%
Man	25	49	33.8%
Other	7	14	33.3%

Four Book of Mormon Name Groups

	Generic	Not Generic	Percent Generic
Jaredite	13	52	20.0%
Nephite	39	110	26.2%
Mulekite	3	3	50.0%
Lamanite	12	19	38.7%

In contrast, in Book of Mormon names, a single author's phonoprint does not emerge. Lamanite, Nephite, Mulekite, and Jaredite names have varied by group in the way one would expect names from different cultures to vary when looking at sounds within names and names as whole units. If the Book of Mormon names were created by an individual, they were created by a very different process or based on languages more different from each other and consistent within themselves than those created by Tolkien.

This article is not the first time aspects of Tolkien's work have been compared to the Book of Mormon. Noel B. Reynolds considered the geography of the two sources and asked if the Book of Mormon describes "real places" or "fantasy geographies and civilizations such as Tolkien's Middle Earth." He then wrote of several places in the Book of Mormon

that can be positively identified in the middle east, explaining how they are described with an accuracy and detail that would have been beyond Joseph Smith's knowledge base.[49] Similarly, Randal A. Wright has asked, "If Tolkien could write *Lord of the Rings*, then why couldn't Joseph Smith write the Book of Mormon?"[50] He then answered his own question by detailing the many years that Tolkien spent writing his book compared to the relatively short time in which Joseph Smith produced the Book of Mormon. He also compared Tolkien's maturity and advanced education to Smith's youth and lack of formal education. Although the comparison between Tolkien's works and the Book of Mormon is not original, this study is the first in-depth comparison of the names found in these two sources.

Hugh Nibley demonstrated differences between Jaredite names in the Book of Mormon and other names that seem to have "Hebrew and Egyptian roots." He wrote, "the Jaredites and Nephites spoke entirely different languages, and even a cursory search will show that Jaredite proper names have a peculiar ring of their own."[51] Although this study did not examine possible connections with ancient languages, it did reveal that Jaredite names are not the only group with a "ring of their own"; names from other Book of Mormon cultures have this as well. If Joseph Smith authored the book, he created phonetically independent name groups — something which Tolkien apparently was unable to do.

As linguistically talented as Tolkien was, he was not able to use different sounds and whole name units consistently according to the different invented languages from which they were derived (i.e., Quenya, Sindarin, Westron, etc.)[52] — even though he was the creator of these languages. Consciously or subconsciously, it appears Tolkien could not escape his own natural leanings toward some phonemes over others as he invented or selected names. If Joseph Smith authored the

49. Noel B. Reynolds, "Locating the Book of Mormon Geographically and Culturally," in *Book of Mormon Authorship Revisited: The Evidence for Ancient Origins*, 375.

50. Randal A. Wright, *The Book of Mormon Miracle: 25 Reasons to Believe* (Springville, UT: Cedar Fort, 2014), 143.

51. Hugh W. Nibley, *Lehi in the Desert; The World of the Jaredites; There Were Jaredites* (Salt Lake City: Deseret Book; Provo, UT: FARMS, 1988), 242.

52. Baker, et al., "Naming Practices in J. R. R. Tolkien's Invented Languages," 5–23. This study identified Tolkien's possible phonoprint as being comprised mostly of these sounds (/b/, /r/, /n/, /l/, /a/, /æ/, /ɛ/) and the onsets /br/, /gr/, /gl/, and /r/ and the codas/n/, /m/, /l/, /r/, /nt/, and /rn/. Although not all the names he selected or invented followed this pattern, a surprisingly large number do, despite his conscious effort to select or invent languages that did not resemble each other.

Book of Mormon, he invented an incredible number of unique names without leaving evidence of a possible phonoprint — a flexibility that Tolkien, despite his incredible repertoire of sounds and symbols, was not able to accomplish.

Authentic names emerge from a variety of geographic, cultural, and ethnic origins, particularly within nations. Thus they show greater variance than fictional names created or selected by a single author. Although much more research needs to be done to establish the validity and reliability of using phonoprints for author identification, this exploratory study may open a door to a fresh line of research that could merit further investigation.

Conclusion: Phonics, Structure, and Meaning

Hugh Nibley wrote, "The evidence that will prove or disprove the Book of Mormon does not exist."[53] Some questions cannot be answered accurately or reliably by tests and analyses. An international variety of linguists, cryptographers, botanists, physicists, and historians have been trying for 600 years to reason out explanations behind the Voynich Manuscript, sometimes referred to as the most mysterious book in the world.[54] Theories of its origin and authorship range from one of the lost tribes of Israel to the Aztecs[55], to a group of medieval scholars in an area near Europe — perhaps in Iran or Turkey.[56]

Stephen Bax, a British professor of applied linguistics, used the methods of historic decoders of Egyptian hieroglyphics, who began with proper names: They searched for the known names of pharaohs to put symbols against sounds. Since Bax did not know the culture or geography affecting the manuscript, he began with words that by their relationship to the drawings seemed to name them — including seven plants and a constellation that he could identify. From names he moved to logically connected linguistic and semantic principles. He was eventually able to work out 10 words of text and sounds for

53. Hugh W. Nibley, *Since Cumorah* (Salt Lake City: Deseret Book, 1987), xiv.

54. Rich McCormick, "Decrypting the Most Mysterious Book in the World," *The Verge*, February 28, 2014, http://www.theverge.com/2014/2/28/5453596/voynich-manuscript .

55. "600 Year Old Mystery Manuscript Decoded by University of Bedfordshire Professor," University of Bedfordshire (website), February 14, 2014, https://www.beds.ac.uk/news/2014/february/600-year-old-mystery-manuscript-decoded-by-university-of-bedfordshire-professor.

56. McCormick, "Decrypting the Most Mysterious Book in the World".

13 symbols.[57] Worldwide headlines hailed Bax as having decoded the manuscript — but many of us would not accept 10 words and 13 sounds as manuscript translation. Fortunately, our understanding of the Book of Mormon is based on a complete translation made possible by the gift and power of God.

Elaborate technological-statistical analyses have discerned linguistic, semantic, and cultural patterns as well as some author factors in the Voynich Manuscript, but they haven't come together into a complete explanation that will reveal either the language or meaning of this book. Similarly, analysis of linguistic, geographic, and cultural factors in the Book of Mormon, including phonemic patterns in its unique names, cannot prove that it is or is not a translation of an ancient record. Nevertheless, results of such investigations are interesting and can be meaningful to those who value the book.

Today's technological tools enable us to answer many questions and solve many mysteries. But the truthfulness of the Book of Mormon must be conveyed with experiences of faith. For some, the Book of Mormon rivals the Voynich Manuscript as the most mysterious book in the world, but the Voynich Manuscript is unreadable. The Book of Mormon is not. Its meaning has been accessible for many years and has been life-changing for millions of Latter-day Saints throughout the world.

Brad Wilcox *is an associate professor in the Department of Ancient Scripture at Brigham Young University, where he teaches Book of Mormon and New Testament classes. His research interests include learning and teaching, literacy, and onomastics (the study of names). He loves being able to combine any of these interests with the Book of Mormon.*

Wendy Baker-Smemoe *is an associate professor in the Department of Linguistics at Brigham Young University. Her research interests include second language acquisition, Utah English, and phonetics.*

Bruce L. Brown *is Professor of Psychology at Brigham Young University, with research focused on developing and applying the science of holistic visual display. He received his PhD in the psychology of language from McGill University, Montreal. He also received NSF-funded post-doctoral training in mathematical psychology at the University of Michigan. His*

57. "600 Year Old Mystery Manuscript Decoded by University of Bedfordshire Professor"; McCormick, "Decrypting the Most Mysterious Book in the World.

early publications are primarily in the area of the psychology of language and psychoacoustics but more recently in the application of multivariate visualization and quantitative methods to a variety of research areas including names in the Book of Mormon. He is the author of several books, over a hundred other published works, and four commercially marketed graphical data presentation systems, one of which, Bibliostat*, is in use by about two-thirds of the libraries in America.*

Sharon Black *is an associate teaching professor who serves as writing consultant and editor for the five departments in the McKay School of Education at Brigham Young University. Her research and writing areas include early childhood and elementary level literacy, elementary arts/literacy integration, children's literature, autism, and onomastics.*