Quranic Studies Made in Austria: Approaching Quantitative Arabic Linguistics

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Abstract

Purpose: The aim of this article is to outline the interest in the Arabic language in Europe and the beginnings of teaching Arabic and establishing Arabic studies in Europe before introducing Quranic studies in Austria as such. In this context, it is important to note that unfortunately, neither Arne Ambros, late professor of Arabic studies at the University of Vienna in Austria, nor the quantitative methods that he introduced to the study of the Quran, are mentioned in Sāsī Sālim al-Ḥāj's comprehensive review of Orientalist studies[1].

Methodology: To show some of the benefits of adopting quantitative linguistic approaches, I introduce the study of hapax legomena, words that occur only once in a given corpus, and present some results of my own multi-layered linguistic analysis of hapax legomena in the Quran[2].

Findings: My research highlights that Arabic quantitative linguistics is still in its infancy and that its methods can help improve our understanding of even a well-studied text like the Quran and open up new fields of enquiry towards studying the text and Arabic literature in general.

Originality: The material presented is based on the first study of hapax legomena in the Quran, and one of the rare studies on an Arabic text employing quantitative methods.

Keywords: Arne Ambros, Vienna (Austria), Quran, quantitative linguistics, hapax legomena

الدراسات القرآنية من النمسا: في اتجاه اللغويات الحاسوبية العربية

أورخان الماس

أستاذ مساعد للدراسات العربية، جامعة سانت أندروز، المملكة المتحدة

ملخص البحث

أهداف البحث: يهدف هذا البحث إلى إلقاء الضوء على الاهتمام الأوروبي باللغة العربية وبدايات تدريس اللغة العربية ووضع الأسس للدراسات العربية في أوروبا، وهو ما مهّد لبداية الدراسات القرآنية في النمسا بالصورة الحالية. وفي هذا الإطار تجدر الإشارة إلى أن دراسة «ساسي سالم الحاج» الشاملة حول الدراسات الاستشراقية قد أغفلت – مع الأسف – ذكر آرني أمبروس، أستاذ الدراسات العربية الراحل بجامعة فيينا في النمسا، ولم تُشر إلى المناهج الكمية التي أدخلها في الدراسات القرآنية.

منهج الدراسة: في محاولةٍ منّا لبيان بعض مزايا تطبيق المناهج اللغوية الكمية، قدمنا دراسة للألفاظ الفرائد hapax legomena، التي لم تُذكر سوى مرة واحدة في أحد المتون، إضافةً إلى تقديم بعض النتائج التي توصل إليها الباحث من خلال التحليل اللغوي متعدد المستويات لفرائد القرآن.

النتائج: أوضح هذا البحث أن الدراسات اللغوية الكمّية للغة العربية لا تزال في مهدها، وأن مناهجها يمكن أن تُساهم في تعميق فهمنا لنص سبقت دراسته باستفاضة مثل القرآن الكريم، وبيّن البحث كذلك أنه يمكن لهذا النوع من الدراسات أن يفتح لنا آفاقًا جديدة للبحث في دراسة النص القرآني والأدبيات العربية بصفة عامة.

أصالة البحث: تعتمد المواد المعروضة في هذا البحث على الدراسة الأولى من نوعها عن فرائد القرآن، وهي دراسة نادرة لأحد النصوص العربية باستخدام المناهج الكمية.

الكلمات المفتاحية: آرني أمبروس، فيينا (النمسا)، القرآن، الدراسات العربية، اللغويات الحاسوبية

1 Sāsī Sālim Al-Ḥāj, Naqd al-khiṭāb al-istishrāqī: al-ẓāhirah al-istishrāqiyyah wa-atharuhā fī l-dirāsāt al-islāmiyyah (Beirut: Dār al-madād al-islāmī, 2002).

2 Norbert Nebes kindly included an edited version of my doctoral thesis Die Interpretationsgeschichte der koranischen Hapaxlegomena (Vienna, 2008) as a volume in his series Jenaer Beiträge zum Vorderen Orient as Studien zu den koranischen Hapaxlegomena unikaler Wurzeln (Wiesbaden: Harrassowitz, 2011)..

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1. A Brief Overview of Arabic Studies in Europe[1]

European scholars have long thirsted for knowledge concerning the Quran for various reasons that have changed over time since the very beginnings of the cultural exchange with the Islamic Middle East. In early mediaeval times, scholars acquired at least a reading knowledge of Arabic to access medical and philosophical texts when Latin translations of Greek originals were not yet available. However, with the onset of the Crusades (1095-1291), Islam became the archenemy of Christianity and thus of Europe (or the so-called 'Christian Occident' as opposed to the 'Muslim Orient'), and the attitude towards Islamic scholars and medics changed. Henceforth, they were not considered to be guardians of the Greek heritage but rather its defilers, since with the discovery of the Greek originals, it was found that the scholarly texts in Arabic were not accurate and literal translations of the Greek texts but included corrections, revisions and expansions. Nevertheless, we can safely assume that one of the positive outcomes of the Crusades was the first complete translation of the Quran from Arabic into Latin, completed by Robert of Ketton in 1143. He titled his by no means flawless translation *Lex Mahumet pseudoprophete* ('Law of the False Prophet Muhammad'), clearly making a statement about the Quran and the Muslim prophet and faith altogether that unfortunately set the tone for centuries to come.

1.1. Anti-Islamic Polemic in Arabic

A new wave of learning Arabic was initiated by the efforts of Flemish grammarian and traveler Nicolas Cleynaerts (1495-1542), who deemed it necessary to polemicize against Muslims and proselytize among them in their native tongue. Thus, the first learning materials for Arabic and dictionaries followed in the sixteenth and seventeenth centuries: Thomas van Erpe's *Grammatica Arabica* was originally published in 1613 and his *Rudimenta linguae Arabicae* followed in 1620, Golius's *Lexicon Arabico-Latinum* in 1653 preempted William Bedwell's lifelong efforts to create an Arabic dictionary. However, Bedwell's name went down in the history of promoting the study of Arabic language and literature, especially in early modern England. He translated the anonymous *Mohammedis Imposturæ* (published in the 1570s in Rome) into English with the self-explanatory title of *A Discovery of the Manifold Forgeries, Falsehood, and horrible impieties of the blasphemous seducer Mohammed: with a demonstration of the insufficiency of his law, contained in the cursed Alkoran*. This work was printed in 1615 and summarizes the *zeitgeist* perfectly, namely, the post-Crusades, late-Renaissance and early-Enlightenment hostile attitude towards Islam characterized by the increasing fear of the approaching Ottomans in much of Europe.

1.2. Arabic as a Semitic Language

Meanwhile, the Catholic Church at the time was considering uniting with the Eastern Churches and invited to Rome several Levantine Christian informants, who were also teaching Arabic, especially since Cleynaerts had demonstrated strong parallels between Arabic and Hebrew and Arabic had begun to be considered helpful with the study of Hebrew. The Arabic lexicon and translation of the Bible were seen as furthering Biblical studies, which in fact was not a new idea at all; indeed, Judah ibn Kuraish (d. 900, Yehuda b. Quraysh), a flourishing comparative philologist of Arabic, Aramaic and Hebrew of the ninth century, had already suggested this approach half a millennium ago.

During the Age of Enlightenment, travelers' accounts sparked philosophers' interest in learning about Eastern civilizations, wisdom and literatures, which in turn redefined the purpose of studying Oriental languages. With the following postulation of the relatedness of languages and the concept of language families in the nineteenth century, the way was paved for the academic study of languages, and the study of Arabic and its dialects was to take place within the soon-after established scholarly field of Semitic studies.

(1) Cf. Kees Versteegh, *The Arabic Language* (Edinburgh: Edinburgh University Press, 1997), pp. 1-7.

1.3. Arabic as an Islamicate Language

Since World War II, the study of Arabic has been grouped together with that of Turkish and Persian among other Islamicate languages (depending largely on the offerings of the university) due to cultural and linguistic contact. Although language contact should not be underestimated, Arabic, Turkish and Persian have structurally as much in common as Hebrew, Uzbek, and Russian, for example. Thus, largely focusing on the shared feature of being Islamicate languages, the study of Arabic, Turkish and Persian has been taking place within the context of Islamic studies since the second half of the twentieth century. This phenomenalization of the Arabic language became even worse in more recent times. Unfortunately, one can deduce from student numbers that there is a correlation between terrorism and war in the Middle East and rising numbers of students in departments offering Arabic, on the one hand, and Arabic speakers suffering from the post-9/11 surge in Islamophobia in terms of facing difficulties when traveling, especially when flying, on the other.

1.4. Arabic Studies in Vienna

The teaching of (Ottoman-Turkish and) Arabic started in Vienna in 1674 by command of Kaiser Leopold I, Holy Roman Emperor, for want of interpreters, who were necessitated not only by the Ottoman wars in Europe but also by trade and cultural exchange with the Ottoman Empire. The first institution dedicated to the study of the Near East was the so-called *Kaiserlich-königliche Akademie für Orientalische Sprachen* (Imperial Royal Academy of Oriental Languages), the mission of which was to educate future Austrian ambassadors to the Ottoman Empire. It was established by Leopold I's granddaughter, Kaiserin Maria Theresia, in 1754 at the apex of the Austrian monarchy's power. Joseph Freiherr von Hammer-Purgstall (1774-1856) headed the academy for a long time; he rose to fame for his many translations from Arabic, Turkish and Persian (and some disgrace for their quality) and later supported the foundation of the Austrian Academy of Sciences in Vienna. This first institution for the study of Oriental languages was reorganized and renamed the *Konsularakademie* (Consular Academy) in the nineteenth century. However, it was closed after the National Socialists' rise to power leading to World War II and remained closed until Bruno Kreisky, Austria's first Jewish chancellor, reinstated it as the *Diplomatische Akademie* (Diplomatic Academy) in 1967. Despite the longstanding tradition of Near Eastern studies, the first Chair of Arabic Studies proper in the German-speaking world was established only in 1962, yet, unsurprisingly, in Vienna. Hans L. Gottschalk, an expert on the history of the Ayyubids, was appointed the first Chair of Arabic Studies at the University of Vienna(1).

2. Arne Amadeus Ambros (1942-2007)

Arne Ambros graduated with a PhD in Theoretical Physics in 1964 and had started studying Arabic while still in high school. He had begun teaching German to Arab students in Vienna at the Österreichische Orient-Gesellschaft Hammer-Purgstall in 1960 and was appointed instructor of Arabic there the year after, to be sworn in as interpreter of Arabic to the courts of Vienna in 1962, a position in which he continued for ten years. He was commissioned to write the first textbook on modern literary Arabic in German, which appeared, in its first edition, in 1969 just after he took up the position of Universitätsassistent (assistant professor) to Professor Hans L. Gottschalk. In 1972, Ambros accepted an offer by Professor Seeger A. Bonebakker to become an assistant professor at the University of California at Los Angeles and left Vienna. He returned to Vienna two years later to defend his Habilitation (i.e., professorial dissertation), which qualified him to become a full professor. When the Chair of Arabic and Islamic Studies at the University of Vienna became vacant in the spring of 1974, Ambros applied for it and became the successor to Hans L. Gottschalk, consequently not accepting tenure at UCLA. In his endeavors to further the study of Arabic at the University of Vienna, he was greatly assisted by Dr. Herbert Eisenstein (Islamic history and culture) and Dr. Stephan Procházka (Arabic dialectology).

(1) Cf. Gebhard J. Selz, Rüdiger Lohlker, Stephan Procházka, Claudia Römer and Sibylle Wentker, 'Der ganze Orient: Zur Geschichte der orientalistischen Fächer am Beispiel einer internationalen orientalistischen Zeitschrift: Die Wiener Zeitschrift für die Kunde des Morgenlandes (WZKM)', *WZKM* 100 (2010), pp. 9-35.

Ambros held the Chair of Arabic and Islamic Studies until 2003. He wrote many chapters as well as articles and published several textbooks and teaching materials, mostly in German. These include *Damascus Arabic* (Undena, 1977), *Türkische Zeitungstexte: ein kommentiertes Lesebuch für Anfänger* (Dr. Kovac, 1995), and *Pascal Übungsbuch für Sprach- und Literaturwissenschaften* (Dr. Kovac, 1995), as well as textbooks and readers for Maltese (Reichert, 1998), Irish (Reichert, 2006), and Swahili (Reichert, 2007). Furthermore, he developed teaching materials for courses that he taught, including classical and modern Arabic (over 200 pages of materials), introduction to Islam, the history of classical Arabic literature, Arabic palaeography, Maltese, Syriac, Old Ethiopic, Nabataean and Modern Persian. In addition to these courses, he also taught classical and modern Arabic, Arabic dialectology and, most significantly, the application of statistics to the study of language(1).

Ambros not only prepared all the aforementioned textbooks and teaching materials but also published scholarly articles and chapters dealing with Arabic linguistics, both classical and modern, and most especially Quranic Arabic, which became his main focus in the 1980s. However, his studies bear his signature, namely, a statistical or quantitative twist, which makes his publications on the Quran not only truly unique and original but also cutting-edge research at its very best, although his studies were not yet computer-assisted. One should keep in mind that the academic study of Arabic in Europe is a relatively recent development and note that although some quantitative approaches and methods such as colometry and stichometry have been applied to linguistic data since ancient times, the International Quantitative Linguistics Association was only established in 1994.

Ambros's most notable contributions to the field of Arabic studies include *Funktionalität und Redundanz in der arabischen Kasusdeklination* (Function and Redundancy of the Arabic Declension, 1972) and *Die morphologische Funktion des Systems von Vokalqualitäten im Althocharabischen* (The Morphological Function of the System of Vowel Qualities in Old Standard Arabic, 1973-75), which had a great impact on the question of the evolution of the modern Arabic dialects. Although these studies are most significant and yielded interesting results, it is in *Lexikostatistik des Verbs im Koran* (Lexicostatistics of the Verb in the Quran, 1987) and *Syntaktische und stilistische Funktionen des Energikus im Koran* (Syntactical and Stylistic Functions of the Energetic Mood in the Quran, 1989) that he demonstrates in a most impressive way the power and benefit of employing basic statistical methods in philological work(2). In the former work, he analyzes the distribution of verbs across the roots represented in the Quran and the frequency of verb patterns(3), while in the latter article, he establishes that the energetic mood is often used in communication between individuals, mostly found in first-person singular verbs in the context of positive affirmation and more widely used in Meccan suras(4).

3. Quranic Hapax Legomena

As one of Ambros's students and a graduate of Arabic studies and computer science, I was highly impressed with his methodology, and I became very much interested in the quantitative analysis of texts and the definition of the meaning of rare words. Therefore, I dedicated one-half of my doctoral dissertation to the study of words in the Quran that occurred only once and were the only attestations of their etymological root in the Quran, the very first step in frequency studies, which much to my surprise had not been done for the Quranic text. In the second part, I analyzed the definitions of fourteen of these words, which have been explained in different ways by lexicographers and exegetes throughout the ages and which have kept many a scholar's mind busy(5).

(1) Cf. Herbert Eisenstein and Stephan Procházka, Arne A. Ambros – ein Nachruf, *WZKM* 98 (2008), pp. 9-12.

(2) Cf. Gebhard J. Selz et al., p. 22.

(3) See Arne Ambros, 'Eine Lexikostatistik des Verbs im Koran', WZKM 77 (1987), pp. 9-36.

(4) See Arne Ambros, 'Syntaktische und stilistische Funktionen des Energikus im Koran', WZKM 79 (1989), pp. 35-56.

(5) I analyzed the historical semantics of the following hapax legomena: *naḥb* (Q 33:23), *qiṭṭ* (Q 38:16), *rahw* (Q 44:24), *ḥubuk* (Q 51:7), *sāmidūn* (Q 53:61), *dusur* (Q 54:13), *shuwāẓ* (Q 55:35), *musannada*^{t} (Q 63:4), *zanīm* (Q 68:13), *ḥard* (Q 68:25), *ḥusūm* (Q 69:7), *kunnas* (Q 81:16), and *ṣamad* (Q 112:2); see Elmaz 2011:131-230.

So-called *hapax legomena* denote words said or read only once in Greek, and they have attracted broad and increasing interest throughout the last two millennia. The term itself seems to have been used for the first time in the field of Homeric studies and by Zenodotus of Ephesus(1) (d. 260 BCE), specifically. The enormous number of publications on hapax legomena and their varying uses and functions can be seen in bibliographies such as that of Pastor de Arozena(2), but the vast majority of publications still pertain to the fields of classics and Biblical studies; one of these publications is Katz's, who discussed *huaha*, a hapax in the Dead Sea scrolls, in a 135-page monograph(3).

Through frequency analyses of texts, linguists broadly try to answer questions on authorship(4) and style(5), although there can be several reasons for a word occurring just once. Dealing with hapax legomena, for instance, Kyriakou and Rengakos observed that Appolonius Rhodius used Homeric hapaxes in his *Argonautika* only once as well to preserve their stylistic value(6). In an Old Norse poem, we find Christian terms(7) to be hapaxes; in Flavius Josephus's *Contra Apionem*(8), they describe polytheistic themes; and in Joshua 15, a number of toponyms(9) are hapaxes. Among others, poetic licenses(10), archaic forms(11), meter(12), onomatopoeias(13) and translation or calquing(14) can yield hapaxes similar to mistakes(15) or typos.

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(1) See David E. Aune, *The Westminster Dictionary of New Testament & Early Christian Literature & Rhetoric* (Louisville: Westminster John Knox Press, 2003), p. 210f.

(2) See Bárbara Pastor de Arozena, 'En torno al hapax transicional', *Die Sprache* 39:1 (1997), pp. 115-122, p. 115f.

(3) Elíás Katz, *HUAHA: Die Bedeutung des Hapax Legomenon der Qumraner Handschriften*. (Bratislava: Vydavatel'stvo Slovenskej akadémie vied, 1966).

(4) See, e.g., Nesselrath, Heinz-Günther. *Lukians Parasitendialog: Untersuchungen und Kommentar* (Berlin: Walter de Gruyter, 1985), p. 3.

(5) See Roy Lachman et al., *Cognitive Psychology and Information Processing: An Introduction* (Hillsdale, New Jersey: LEA, 1979), p. 361.

(6) See Poulheria Kyriakou, *Homeric hapax legomena in the Argonautica of Apollonius Rhodius: A literary study*, (Stuttgart: Franz Steiner, 1995), 54.

(7) See Jan de Vries, Altnordische Literaturgeschichte (Berlin: Walter de Gruyter, 1999), p. 58.

(8) See Christine Gerber, *Ein Bild des Judentums für Nichtjuden von Flavius Josephus: Untersuchungen zu seiner Schrift Contra Apionem*, (Leiden: Brill, 1997), p. 421.

(9) See Jacobus Cornelis de Vos, *Das Los Judas: Über Entstehung und Ziele der Landbeschreibung in Josua 15*, (Leiden: Brill, 2003), p. 343.

(10) Dhū al-Rumma uses *mustawʿil* for *waʿil* 'ibex' (see Bauer, Thomas, *Altarabische Dichtkunst: Eine Untersuchung ihrer Struktur und Entwicklung am Beispiel der Onagerepisode* (2 vols., Wiesbaden: Harrassowitz, 1992), vol. 1, p. 238 fn. 56) and derives ad hoc *asfā* from *safā* 'Grannen des Gerstenpfriemengrases' ['prickles of barley-grass' cf. Lane p. 1378a]; see Bauer, *Dichtkunst*, vol. 2, p. 437 commentary on dhR 28/36.

(11) E.g., OLat. *ōximē* for *ocissime*; see Eric P. Hamp, 'The Indo-European Horse', in T.L. Markey and J.A.C. Greppin (eds.), *When Worlds Collide: The Indo-Europeans and the pre-Indo-Europeans* (Ann Arbor: Karoma Publishers, 1990) pp. 211-226, p. 212.

(12) E.g., Lat. *innubis* for *innubilus* 'unclouded'; see Margarethe Billerbeck, *Senecas Tragödien: Sprachliche und stilistische Untersuchungen* (Leiden: Brill, 1988), 105, p. 155.

(13) E.g., OESl. *rokotaxu* 'they warbled' in Igor's Tale; see Jean Yves Le Guillou, *Le Dit de la campagne d'Igor: Introduction essai d'édition-reconstruction du texte traduction en prose notes historiques et linguistiques*. (Montréal: Presses de l'Université du Québec, 1977), 2, p. 28.

(14) E.g., Greek *akōlytōs* for Syriac *dəlā kelyān* 'unhindered, without hindrance' in Acts 28:31; see Michael Tilly, 'Das Ende des Paulus und die syrische Texttradition Act 28 17-31 in der Überlieferung der Peschitto', in Friedrich W. Horn (ed.), *Das Ende des Paulus*, (Berlin: Walter de Gruyter, 2001), 106, pp. 107-125, p. 121.

(15) E.g., Mand. *bihtit* for *pihtit* 'I opened'; see Rudolf Macúch, 'Zur Grammatik und zum Wörterbuch des Mandäischen', in Rudolf Macúch (ed.), *Zur Sprache und Literatur der Mandäer: Mit Beiträgen von Kurt Rudolph und Eric Segelberg*. Studia Mandaica (Berlin: de Gruyter 1976), 1, pp. 1-146, p. 97.

Due to the lack of further occurrences, the meaning of a hapax can be difficult to determine, and it can even remain unclear. Some difficult Biblical words have been elucidated through other Semitic languages, most notably Akkadian or Ugaritic as well as Arabic (as mentioned earlier, and at the explicit recommendation of none other than the German Orientalist Theodor Nöldeke(1)). Psalm 68 of the Hebrew Bible was named the *Mont Blanc de l'exégèse*(2) for no other reason than the high number of rare words and hapax legomena that it contains.

The first scholar extracting some Biblical hapaxes was Saʿadya Gaon [Saʿīd ibn Yūsuf al-Fayyūmī] (d. 942), who seems to be the first author to have coined the term *farīdah*, meaning 'hapax', in his *tafsīr as-sabʿīn* [*at-tisʿīn*] *lafẓah al-faridah*, in which he dealt with 90 (or 96(3)) difficult words and hapax legomena in the Old Testament. However, a study of Biblical hapaxes as such was not conducted until 1984, when Greenspahn published his dissertation *Hapax Legomena in Biblical Hebrew*(4).

It was 17 years after Greenspahn before al-Bassūmī compiled a glossary of hapax legomena in the Quran(5). This was accompanied by a list of 395 'once-words', that is, words occurring once that are the only words derived from their roots (*al-alfāẓ al-qurʾāniyyah allatī lam tatakarrar illā marrah wāḥidah faqat wa-lam yushtaqqᵃ min jadhrihā al-lughawī siwāhā* 'hapax legomena of unical roots', abbr. HLu); this list filled the lexicographical gap that Andrew Rippin(6) had identified in 1988. Since a linguistic study of Quranic HLu was still lacking in 2006(7), I decided to make the nominal and verbal hapaxes in the Quran the topic of my doctoral thesis (*Die Interpretationsgeschichte der koranischen Hapaxlegomena*), for which I was awarded research grants from the University of Vienna in 2007 (F134-G) and 2008 (F203-G).

I counted 391 words that fulfilled both of these conditions and analyzed mainly their morphology, their contribution to rhyme in the Quran, the phonetic structure of their roots and phonetic preferences in the Quranic set of Arabic roots, as well as their semantics and their occurrence in rhetorical figures. Although they constitute only 0.5% of the words that make up the Quranic text, I could prove, by employing methods from quantitative linguistics that their contribution is actually not to be underestimated in any way or manner. In the following, I will proceed to outline some of my results from the sections in which I analyzed their morphology and their contribution to the Quranic 'rhyme'(8).

(1) See A.S. Yahuda, 'Hapax Legomena im Alten Testament', *The Jewish Quarterly Review* 15:4 (1903), pp. 698-714, p. 699.

(2) See Jörg Jeremias, *Das Königtum Gottes in den Psalmen. Israels Begegnung mit dem kanaanäischen Mythos in den Jahwe-König-Psalmen*, (Göttingen: Vandenhoeck & Ruprecht, 1987), 141, p. 69.

(3) See Irene Zwiep, 'Die Entwicklung der hebräischen Sprachwissenschaft während des Mittelalters', in Sylvain Auroux/ E.F.K. Koerner/ Hans-Josef Niederehe/ Kees Versteegh (eds.), *Geschichte der Sprachwissenschaften: Ein internationales Handbuch zur Entwicklung der Sprachforschung von den Anfängen bis zur Gegenwart* (2 vols., Berlin: Walter de Gruyter, 2000), vol. 1, pp. 228-234, p. 229.

(4) Frederick E. Greenspahn, *Hapax Legomena in Biblical Hebrew: A study of the phenomenon and its treatment since antiquity with special reference to verbal forms*, (Chico, California: Scholars Press, 1984), 74.

(5) Al-Bassūmī, Bāsim Saʿīd, *Muʿjam al-farāʾid al-qurāʾniyyah* (al-Bīrah: Markaz nūn li-l-dirāsāt wa-l-abḥāth al-qurʾāniyyah, 2001).

(6) See Andrew Rippin, 'Lexicographical texts and the Qurʾān', in Andrew Rippin (ed.), *Approaches to the history of the interpretation of the Qurʾān* (Oxford: Oxford University Press, 1988), pp. 158-74, p. 167.

(7) Shawkat Toorawa has been actively publishing in the field of Quranic hapaxes since, e.g., 'Hapless Hapaxes and Luckless Rhymes: The Qur'an as Literature', *Religion & Literature* 41/2 (2009), pp. 221–227, and 'Hapaxes in the Qur'an: Identifying and Cataloguing Loan Words (and Loan Words)', in *New Perspectives on the Qur'an. The Qur'an in Its Historical Context 2*, ed. Gabriel S. Reynolds (London: Routledge, 2011), 191–244. For a literature review and an overview of Quranic hapaxes in Persian, see Karimi-Nia, Morteza, 'Takāmad dar Qorān: tahlili bar vājehā va tarkibāt-e tak-kārbord dar Qorān-e karim', *Pajuheshhā-ye Qorān va Hadīs* 47/2 (2014-2015): 247-284.

(8) Cf. Elmaz, *Studien*, pp. 48-57.

3.1. Distribution

The number of 391 HLu among 1,676 counted roots (1,635 tri-, 38 quadri- and 3 multiliteral[1]) represented in the Quran implies that nearly every fourth root is represented only by a hapax. There are 377 tri-[2], 13 quadri-[3] and one multiliteral HLu (the Wanderwort *zanjabīl* 'ginger'). The number of roots that are represented only through one lemma in the Quran (hence, 'unical' roots), i.e., hapax (377+13+1), dis[4] (115+9), tris[5] (60+4) or 'X-'[6] (157+10+2) legomena (for words occurring more than three times),

(1) The roots ʾSMʿL, ZNĞBL and ʾSTBRQ are considered to be multiliteral.

(2) Triliteral HLu-roots are ʾBB, ʾBQ, ʾṮL, ʾDD, ʾRM, ʾSN, ʾLT, ʾMT, ʾNM, ʾWD, ʾYM, BʾR, BBL, BTR, BTK, BĞS, BḤṮ, BSQ, BSM, BṢL, BṬʾ, BĠL, BQʿ, BQL, BKK, BLʿ, BHL, BYD, TʿS, TFṮ, TQN, TLL, TYN, TYH, ṮBṮ, ṮBW, ṮĞĞ, ṮRW, ṮYB, ĞBT, ĞBN, ĞBH, ĞṮṮ, ĞḌW, ĞRR, ĞRʿ, ĞRF, ĞSS, ĞFN, ĞLS, ĠMḤ, ĠMD, ĠMM, ĠWS, ĠWF, ĠWW, ĠYD, ḤBK, ḤTM, ḤṮṮ, ḤDB, ḤRD, ḤRS, ḤRK, ḤRY, ḤSM, ḤṢṢ, ḤṢL, ḤFD, ḤQF, ḤNḌ, ḤNK, ḤWB, ḤWZ, ḤYD, ḤYR, ḤYF, ḤBʾ, ḤBZ, ḤBṬ, ḤBW, ḤTR, ḤŠB, ḤḌD, ḤṮṮ, ḤLʿ, ḤMṮ, ḤNQ, ḤYM, DṮR, DḤW, DSR, DSS, DSW, DFʾ, DFQ, DLK, DMĠ, DMM, DNR, DHQ, DHM, DHW, ḌʾM, ḌḤR, ḌʿN, ḌKW, ḌHL, ḌWD, ḌYʿ, RBḤ, RTʿ, RTQ, RḤQ, RḤW, RDʾ, RDM, RṢṢ, RĠM, RFF, RQQ, RKD, RKZ, RMḤ, RMD, RMZ, RMḌ, RHW, RWʿ, RWM, RYŠ, RYʿ, RYN, ZBN, ZḤF, ZRB, ZRQ, ZRY, ZFF, ZML, ZNM, ZHD, ZHR, SĞW, SḤL, SDW, SRD, SṬḤ, SṬW, SĠB, SFʿ, SKB, SKT, SLB, SLQ, SMD, SMK, SND, SNM, SNW, SHR, SHL, SHM, SWṬ, SYB, ŠTW, ŠḤM, ŠRD, ŠRṬ, ŠʿL, ŠĞF, ŠFH, ŠKS, ŠMT, ŠMḤ, ŠMZ, ŠWB, ŠWẒ, ŠWK, ṢḤḤ, ṢRʿ, ṢʿR, ṢFN, ṢKK, ṢLD, ṢMT, ṢMD, ṢMʿ, ṢWʿ, ṢWF, ṢYṢ, ṢYF, ḌʾN, ḌBḤ, ḌDD, ḌMR, ḌNK, ḌNN, ḌHʾ, ḌYR, ḌYZ, ṬḤW, ṬRḤ, ṬFF, ṬLḤ, ṬLL, ṬMM, ṬWD, ẒʿN, ʿBʾ, ʿDS, ʿRM, ʿZW, ʿSS, ʿSL, ʿḌW, ʿṬF, ʿFR, ʿMQ, ʿNW, ʿWL, ʿYB, ĠBN, ĠDQ, ĠZL, ĠZW, ĠṢB, ĠṢṢ, ĠṬŠ, ĠLQ, ĠMZ, ĠMḌ, ĠWL, FTʾ, FTQ, FĞW, FRṮ, FRʿ, FRH, FSR, FṢḤ, FṢM, FḌḤ, FḌW, FẒẒ, FQʿ, FLN, FND, FNN, FNY, FHM, FWḌ, FWM, FYL, QBḤ, QṮʾ, QDḤ, QRŠ, QSR, QSS, QṢF, QṢM, QḌB, QḌḌ, QṬṮ, QṬN, QʿR, QFL, QLʿ, QMḤ, QMʿ, QML, QWB, QWS, KBD, KṮB, KDR, KDW, KSD, KŠṮ, KFʾ, KFT, KLʾ, KLḤ, KND, KNS, KWY, LḤF, LḤN, LḤW, LZB, LFḤ, LFẒ, LQB, LQḤ, LHM, LWḌ, MĞS, MḤL, MḤḌ, MRT, MZN, MSḤ, MSD, MSW, MŠĞ, MṬW, MʿZ, MʿN, MʿY, MKK, MYR, NBZ, NBṬ, NTQ, NĞD, NĞS, NḤB, NḤR, NḪR, NSR, NḌĞ, NḌḤ, NṬḤ, NʿQ, NʿL, NĠḌ, NFṮ, NFḤ, NFY, NQʿ, NKD, NMM, NHĞ, NWʾ, NWŠ, NWṢ, NWN, NWY, HĞD, HĞʿ, HDM, HRB, HRT, HZL, HŠŠ, HLʿ, HMD, HMR, HMS, HWʾ, HYT, HYL, WʾD, WʾL, WBR, WTN, WĞB, WḤŠ, WSN, WŠY, WḌN, WṮN, WFD, WFR, WFḌ, WQB, WQḌ, WKD, WKZ, WLT, WNY, WHĞ, WHY, YQT, YQẒ and YNʿ.

(3) Roots of quadriliteral Quranic hapax legomena are ḤLQM, ḪRṬM, DRHM, ZMHR, SRDQ, ŠRḌM, ḌFDʿ, ʿBQR, ʿRĞN, QŠʿR, QṬMR, QMṬR and NMRQ.

(4) Roots of triliteral Quranic *dis legomena* are ʾṮṮ, ʾŠR, ʾFQ, ʾLL, ʾML, ʾMW, ʾWH, BḪʿ, BRṢ, BZĠ, BSL, BʿR, BNN, TBT, TNR, ṮḪN, ṮʿB, ṮQB, ĞBB, ĞRD, ĞRZ, ĞSM, ĞLL, ḤBS, ḤĞZ, ḤŠW, ḤṬB, ḤṬṮ, ḤQB, ḤWḌ, ḪBL, ḪDN, ḪṢF, ḪMD, ḪMṢ, ḪWR, DḪN, DMʿ, DHR, RSḪ, RSS, RʿD, RFT, RFṮ, RKS, RMM, RWḌ, ZĞĞ, ZLM, ZMR, SBʾ, SFK, SQM, SHW, ŠHQ, ṢBʿ, ṢĠW, ṢFD, ṢNW, ḌĠN, ḌMM, ṬRW, ṬLṮ, ṬMṮ, ʿTQ, ʿĞF, ʿZB, ʿḌD, ʿḌḌ, ʿḌL, ʿHN, ʿYW, ĠṮW, ĠDR, ĠRW, ĠṬY, ĠLF, ĠWṮ, ĠYḌ, QṬF, QWʿ, QYḌ, KRS, KSL, KLW, KMM, KMH, KHL, KHN, KYN, LBN, LDD, LĠB, LQṮ, LMḤ, LHṮ, MḤṢ, MḤQ, MḪN, MḪR, MLḤ, MLQ, NBʿ, NṢT, NʿS, NKṢ, HBW, HRʿ, HŠM, HYĞ, WDQ, WSL, WṢB, WṮR and YSʿ. Quadriliteral *dis legomena* are derived from BʿṮR, ḤNĞR, ḪRDL, SRMD, ʿNKB, FRDS, QRṬS, QSṬS and MRĞN.

(5) Roots of triliteral Quranic *tris legomena* are ʾSS, ʾṢR, ʾFF, BRḤ, BHM, ṮLL, ĞʾR, ĞṮW, ĞDṮ, ĞḌʿ, ĞZʾ, ĞLT, ĞYB, ḤDQ, ḤWĞ, ḌʾB, ḌQN, RĠD, RKḌ, RMN, RHṮ, RWĠ, ZBD, ZFR, ZQM, SʾM, SLW, ŠʿM, ŠḤN, ṢBʾ, ṢḪR, ḌĞʾ, ḌĠṮ, ṮFʾ, ṮFQ, ʿYR, FTL, FĞĞ, FRT, FZZ, QRḤ, QRD, KBT, KWR, LĞʾ, LFW, LQF, LHB, MTN, MḤW, MZĞ, MḌĠ, NʾY, NSB, NFḌ, NKF, HṬʿ, WTD, WṮN and WĞS. Quadriliteral tris legomena are derived from BRZḪ, ĞBRL, SRBL and SNDS.

(6) Triliteral roots deriving only one word occurring more than three times in the Quran are ʾBD, ʾḤD, ʾDM, ʾRḌ, ʾRK, ʾMD, ʾMS, ʾNṮ, ʾHLu, ʾYB, ʾYK, BʿL, BĠT, BĠḌ, BQR, BKM, BWB, BWL, TĞR, THT, ṮQF, ṮMD, ṮWR, ĞBR, ĞṮM, ĞḤD, ĞḪM, ĞSD, ĞND, ḤBL, ḤRĞ, ḤZB, ḤẒẒ, ḤNF, ḤWT, ḤYṮ, ḤYṢ, ḤYQ, ḤYN, ḪRR, ḪRQ, ḪSF, ḪṮW, ḪWW, DBB, DḪR, DMY, DWD, DWN, ḌRʾ, RʾS, RĞS, RḌL, RʿB, RMY, RYM, ZKR, SBṮ, SBL, SDR, SRĞ, SFN, SQR, SQF, SLḤ, SLK, SWF, SWL, ŠʾN, ŠRḤ, ŠṬR, ŠṬN, ŠKK, ŠMS, ŠHB, ŠHR, ŠYḤ, ṢRḤ, ṢRṬ, ṢLL, ṢNM, ṢWT, ṢYḤ, ḌYʿ, ṬBʿ, ṬBQ, ṬFL, ṬMS, ṬYN, ʿṮW, ʿDN, ʿSW, ʿQL, ʿQM, ʿMH, ʿNB, ʿNQ, ʿWĞ, ʿWR, ʿWM, ʿYS, ĠḌḌ, ĠLM, ĠMR, FʾD, FŠL, FWĞ, FWH, QḌF, QRʿ, QRW, QLM, QMR, QMṢ, KʾS, KTM, KRB, KRR, KSF, KHF, KWB, KWD, LʾK, LBB, LḤM, LSN, LʿL, LWṮ, LWN, LYL, MʿY, MĞD, MQT, MHN, MWS, MWL, MWH, NĞL, NĞM, NḤT, NDD, NṢF, NṢW, NṬF, NʿĞ, NWḤ, NWS, NWQ, HBṬ, HRN, HNʾ, WḌR, WRʾ, WYL, YTM, YDY and YWM. Quadriliteral roots deriving a single word occurring more than three times are BRHM, BRHN, ĞHNM, ḪNZR, ZḪRF, SRʾL, SNBL, FRʿN, KWKB and LʾLʾ.

amounts to 748. This means that approximately every second root is represented through a sole lemma in the Quran, covering 5,421 (5,066+339+16) of its 78,245 tokens(1), i.e., only 6.23%!

Unsurprisingly, the 114 suras of the Quran contain different numbers of HLu: 28 do not contain any HLu at all, while among the 86 other suras, Q 2 contains 21 and thus the most HLu for a single sura(2), while some ayas even include several HLu(3):

HLu	Suras	Sura numbers
0	28	1, 10, 32, 41, 43, 45, 57, 59, 60, 62, 65, 67, 82, 84, 85, 87, 92, 94, 97, 98, 99, 101, 102, 103, 104, 109, 110, 114
1	17	13, 29, 35, 40, 42, 44, 46, 48, 58, 61, 64, 66, 71, 93, 95, 105, 107
2	13	23, 30, 31, 52, 63, 74, 77, 86, 96, 108, 111, 112, 113
3	13	15, 25, 36, 39, 50, 51, 70, 75, 78, 80, 88, 89, 106
4	12	8, 14, 33, 38, 49, 54, 68, 72, 73, 76, 90, 91
5	8	11, 24, 26, 27, 53, 69, 83, 100
6	4	6, 34, 56, 79
7	4	3, 19, 47, 81
8	2	17, 28
9	4	9, 18, 21, 37
10	1	55
11	3	4, 5, 16
13	3	7, 12, 20
14	1	22
21	1	2

(1) There has been some historical variation regarding the number of words and roots in the Quran. According to Ḥusayn Muḥammad Fahmī al-Shāfiʿī's *al-Dalīl al-mufahras li-alfāẓ al-qurʾān al-karīm* (Cairo: Dār al-salām, 2002), there are 77,865 tokens, whereas we find figures of 77,934, 77,437 and 77,277 tokens, respectively, in Suyūṭī's *Itqān* (Jalāl al-Dīn Abū al-Faḍl ʿAbd al-Raḥmān ibn ʿAbī Bakr al-Suyūṭī, *al-Itqān fī ʿulūm al-qurʾān*, Muḥammad Abū al-Faḍl Ibrāhīm (ed.) (Beirut: al-Maktabah al-ʿaṣriyyah, 1426/2006), p. 163), while Muḥammad Zakī Muḥammad Khiḍr differentiates 17,622 types of 1,767 'roots' in his *Muʿjam kalimāt al-qurʾān al-karīm* (http://www.al-mishkat.com/words, 1426/2005). However, Martin R. Zammit (*A Comparative Lexical Study of Qur'ānic Arabic*, (Leiden: Brill, 2002), p. 2) states that there are 1,717 lexical items belonging to 1,504 roots. Nonetheless, this is not convincing, as we find 2,367 different nouns in Arne Ambros's data ('Die morphologische Funktion der Vokalqualitäten im Althocharabischen', WZKM 65/66 (1973/74):77-150, p.85), and 1,763 verbal forms including deverbal nominal forms in Moustapha Chouémi's analysis of the verbs in the Quran (*Le verbe dans le Coran* (Paris: Klincksieck, 1966), p. 233), and 1,458 different verbal forms from 928 roots in Ambros (*Lexikostatistik*, p. 13).

(2) Some ayas contain more than a single HLu: Q 2:255 (M), 4:83 (M), 6:143 (K3), 7:133 (K3), 7:150 (K3), 9:35 (M), 11:44 (K3), 12:20 (K3), 18:79 (K2), 20:12 (K2), 21:30 (K2), 22:27 (M), 22:40 (M), 23:104 (K2), 27:88 (K2), 28:34 (K3), 37:103 (K2), 49:11 (M), 53:9 (K1), 55:76 (K1), 63:4 (M), 69:7 (K1), 73:14 (K1), 100:1 (K1), 106:2 (K1) and 111:5 (K1) contain each two, whereas Q 2:102 (M), 16:80 (K3), 34:16 (K3) and 47:15 (M) each contain three, Q 5:3 (M) four and Q 2:61 (M) a maximum of five HLu.

(3) HLu phrases include *(mimmā tunbitu l-arḍu min) baqlihā wa-qiththāʾihā wa-fūmihā wa-ʿadasihā wa-baṣalihā* (Q 2:61), *fa-tukwā (bihā) jibāhuhum* (Q 9:35), *fa-khlaʿ naʿlayka* (Q 20:12), *(kānatā) ratqan fa-fataqnāhumā* (Q 21:30), *la-huddimat ṣawāmiʿu* (Q 22:40), *wa-tallahū li-l-jabīn* (Q 37:103), *(wa-lā) tanābazū bi-l-alqābi* (Q 49:11), *(fa-kāna) qāba qawsayni* (Q 53:9), *khushubun musannadatun* (Q 63:4) and *(wa-kānati l-jibālu) katīban mahīlan* (Q 73:14).

Looking at the distribution over sura periods as proposed by Nöldeke[1], i.e., early, middle, and late Meccan suras and Medinan suras (abbr. K1, K2, K3, and M, respectively), one cannot draw a strong conclusion about the distribution of HLu. This is because the suras of each period are not of comparable length[2]:

Type	0	1	2	3	4	5	6	7	8	9	10	11	13	14	21	HLu
K1	15	4	9	8	4	4	2	1	0	0	1	0	0	0	0	**111**
K2	2	2	1	4	4	2	0	1	1	3	0	0	1	0	0	**97**
K3	4	6	2	1	1	1	2	0	1	0	0	1	2	0	0	**79**
M	7	5	1	0	3	1	0	2	0	1	0	2	0	1	1	**104**
HLu	**0**	**17**	**26**	**39**	**48**	**40**	**24**	**28**	**16**	**36**	**10**	**33**	**39**	**14**	**21**	**391**

Nevertheless, one can test whether there is a correlation between the length of a sura in ayas and the number of HLu it contains for each period of revelation as proposed by Nöldeke or overall in the Quran:

Corr.	All	Meccan	K1	K2	K3	Medinan
Pearson	0.747	0.665	0.662	0.551	0.736	0.868
Spearman	0.662	0.591	0.585	0.611	0.634	0.821
Kendall	0.502	0.442	0.407	0.462	0.485	0.650

Since the p-values are virtually zero, one can say that the number of ayas and HLu that a sura contains are directly proportional and grow together, i.e., the longer a sura is, the more likely it is to contain more HLu. This relationship becomes manifest with increasing sura length (here: revelation period), making HLu an organic part of the Quranic discourse including the longer, Medinan suras.

3.2. Morphology

One might wonder whether HLu are peculiar in terms of morphology and represent rare nominal and verbal patterns. To examine their contribution to the morphological variety in the Quranic text as such, one must have a complete data set for the Quran to check them against. Fortunately, we can rely on Ambros's[3] and Chouémi's[4] data for nominal and verbal morphology. We can say that approximately 30% of the HLu are triliteral ("Verb T") and quadriliteral ("Verb Q") verbal forms[5], while 56% are nouns and the remaining 14% are deverbal nominal forms (comprising more active participles [AP] than passive participles [PP]). The fewest HLu are verbal nouns – of derived stems, to be exact – or quadrilateral verbal forms.

(1) Unlike Azhar, Nöldeke considers four suras to be non-Medinan because he suggests Q 55 and Q 99 to be early Meccan, Q 76 middle Meccan and Q 13 late Meccan; see Theodor Nöldeke, *Geschichte des Qorāns: Erster Teil. Über den Ursprung des Qorāns*, Friedrich Schwally (ed.) (Leipzig: Dietrich'sche Verlagsbuchhandlung, 1909).

(2) 48 suras (1,219 ayas, 105 ayas containing 111 HLu, 5,556 words) are considered early Meccan, 21 suras (1,898 ayas, 91 ayas containing 97 HLu, 16,955 words) middle Meccan, 21 suras (1,656 ayas, 68 ayas containing 78 HLu, 26,395 words) late Meccan and 24 suras (1,463 ayas, 86 ayas containing 104 HLu, 28,501 words) Medinan.

(3) See Arne A. Ambros, 'Die morphologische Funktion des Systems der Vokalqualitäten im Althocharabischen: Teil 2', *WZKM* 67 (1975), pp. 93-164, p. 120f.

(4) See Chouémi's verbal root count in Moustapha Chouémi, *Le verbe dans le Coran* (Paris: Klincksieck, 1966), p. 233 [sums corrected by the author].

(5) The Roman numbers indicate the different forms of the verb in Arabic morphology as follows *faʿ{a,i,u}la* (I), *faʿʿala* (II), *fāʿala* (III), *ʾafʿala* (IV), *tafaʿʿala* (V), *tafāʿala* (VI), *infaʿala* (VII), *iftaʿala* (VIII), *ifʿalla* (IX), *istafʿala* (X), *ifʿālla* (XI) of the triliteral verb, and *faʿlala* (QI) and *ifʿalalla* (QIV) of the quadriliteral verb, respectively. The forms that do not occur in the Quran are *ifʿawʿala* (XII), *ifʿawwala* (XIII), *ifʿanlala* (XIV) and *ifʿanlā* (XV) of the triliteral verb and *tafaʿlala* (QII) and *ifʿanlala* (QIII) of the quadriliteral verb.

Word form	***K1***	***K2***	***K3***	***M***	***Total***	***Ratio***
Noun	68	54	43	55	**220**	***56.27%***
Triliteral verbs: forms I-XI	23	31	25	33	**112**	***28.64%***
Active participles: forms I-XI	12	10	3	8	**33**	***8.44%***
Passive participles: forms I-XI	5	2	2	4	**13**	***3.32%***
Verbal nouns: forms I-XI	1	1	2	3	**7**	***1.79%***
Quadriliteral verbs: forms QI and QIV	2	0	3	0	**5**	***1.28%***
hayta (Q 12:23)	-	-	1	-	**1**	***0.26%***
Total	***111***	***98***	***79***	***103***	***391***	

3.2.1. Nominal morphology

Ambros counted 2,367 nouns(1) belonging to 100 patterns, which he arranged into 22 classes. The nominal HLu are of 50 different patterns, to which approximately 90% of the Quranic nouns belong. Based on his data, the ratio of HLu for single patterns ranges from 3.57% (*fuʿal*) to 100% (*fuʿlūl*); however, the following HLu can be considered particularly peculiar in terms of nominal morphology:

ratio	pattern	HLu	Non-HLu
100%	**fāʿil*	*Bābil*	
	fuʿlūl	*ḥulqūm, khurṭūm, ʿurjūn*	
	faʿwal	*qaswarah*	
	fuʿālil	*Surādiq*	
	C_1uC_2	*Thubāt*	
75-100%	*faʿlalīl*	*qamṭarīr, zamharīr, zanjabīl*	*salsabīl*
50-100%	*y-*	*yaqṭīn*	Yaḥyā
66%	C_2iC_3	*sinah, shiyah*	*diyah*
50%	*fīʿāl*	*Dīnār*	Mīkāl
	fiʿʿāl	*qiththāʾ*	*kidhdhāb*
	fiʿlil	*shirdhimah*	*silsilah*
	C_1iC_2	*ʿizīn, ʿiḍīn*	*fiʾah, miʾah*

3.2.2. Verbal morphology

Regarding rarities concerning verbal morphology, there is only one example of form XI (*ifʿālla*) – the dual participle *mudhāmmatān* in Q 55:64, an aya with a unit length(2). The HLu *la-nasfaʿan* [لَنَسْـفَعًا]

(1) I added *thubāt* (C_1uC_2), *ẓarabiyy* (*-īy*) and *ʿabqariyy* (*-īy*), which were not documented in Ambros's data, in addition to a pattern for augmented *qaswarah* (*faʿlal* > *faʿwal*) and counted *maryam* and *madyan* as of *mafʿal* (< *faʿlal*) and *zabāniyah* as of *–iy* (< 'Residuum').

(2) There are 27 more ayas consisting of only one word, 20 of them being *fawātiḥ* or *muqaṭṭaʿāt* (ḤM (7), ʾLM (6), ṬSM (2), YS, KHYʿṢ, ʿSQ, ṬH, ʾLMṢ), four objects of oath (*wa-l-fajr*^{i}, *wa-l-ʿaṣr*^{i}, *wa-ṭ-ṭūr*^{i}, *wa-ḍ-ḍuḥā*) and three subjects (*al-qāriʿat*^{u}, *ar-raḥmān*^{u}, *al-ḥāqqa*^{tu}).

(Q 96:15) is the only other definite energetic (I) form[1], i.e., without *shaddah* on the *nūn* morpheme, besides *wa-la-yakūnan* [وَلَيَكُونًا] (Q 12:32)[2].

3.3. HLu as *fawāṣil*

Often enough, the last word in an *aya* has been considered to simply 'build rhyme', ignoring the meaning of the Arabic term denoting these rhymes: *fawāṣil* 'dividers'. Angelika Neuwirth defines the *fāṣilah* as a means of structuring the discourse by resemblance of sound ('Klangentsprechung zur Gliederung der Rede'[3]). A total of 118 out of 391 HLu end an aya[4], achieving this near-rhyme through consonantal rhyme or resemblance in the last literal(s) of the root[5], the morphological pattern[6] and affixation[7], or, most often, through a combination of the mentioned factors[8]. While 55 suras contain no fHLu, Q 55 contains 6 such 'rhyming' HLu-*fawāṣil* (fHLu).

fHLu	Type	Suras	Sura numbers
0	K1	17	1, 52, 82, 84, 85, 87, 92, 94, 95, 97, 99, 101, 102, 103, 104, 109, 114
	K2	5	21, 27, 43, 44, 67
	K3	14	6, 10, 14, 16, 29, 31, 32, 34, 39, 40, 41, 42, 45, 46
	M	19	2, 3, 4, 5, 8, 33, 48, 49, 57, 58, 59, 60, 62, 63, 64, 65, 66, 98, 110
1	K1	11	51, 77, 88, 89, 93, 96, 105, 107, 111, 112, 113
	K2	8	17, 23, 25, 26, 36, 38, 50, 71
	K3	6	7, 11, 13, 28, 30, 35
	M	4	9, 22, 24, 61
2	K1	8	69, 73, 74, 75, 86, 91, 106, 108
	K2	2	15, 72
	K3	1	12
	M	1	47

(1) Ambros lists 108 energetic verbal forms in the Quran; see Arne A. Ambros: 'Syntaktische und stilistische Funktionen des Energikus im Koran', *WZKM* 79 (1989), pp. 35-56, p. 41.

(2) The corresponding energetic form with *shaddah*, i.e., *–anna*, occurs as *yakūnanna* in Q 35:42. Furthermore, the energetic mood of the verb *kāna* can be found in the following 19 *ayas*:

takūnanna	Q 2:147, Q 6:14, Q 6:35, Q 6:114, Q 10:94, Q 10:95, Q 10:105, Q 28:86, Q 28:87
la-nakūnanna	Q 6:63, Q 7:23, Q 7:149, Q 7:189, Q 10:22
la-takūnanna	Q 26:116, Q 26:167
la-akūnanna	Q 6:77
wa-la-nakūnanna	Q 9:75
wa-la-takūnanna	Q 39:65

(3) See Angelika Neuwirth, *Studien zur Komposition der mekkanischen Suren: Die literarische Form des Koran - ein Zeugnis seiner Historizität?* (Berlin: de Gruyter, 2007), p. 65. For a detailed study of rhyme and rhythm in the Quran, see Pierre Crapon de Caprona, *Le Coran - aux sources de la parole oraculaire: structures rythmiques des sourates mecquoises*, (Paris: Publications orientalistes de France, 1981).

(4) Two HLu were not ascribed this function although they are the last words in the *ayas* in which they occur – *taʿūlū* (Q 4:3) and *ḥubuk* (Q 51:7) – because the surrounding *ayas* end on *kabīran* and *marīʾan* and *la-wāqiʿ* and *mukhtalif*, respectively.

(5) E.g., *kunnas* (Q 81:16; following *khunnas*), *lāzib* (Q 37:11; following *thāqib*).

(6) E.g., *ḍīzā* (Q 53:22; following *al-unthā*), *al-ṣamad* (Q 112:2; following *aḥad*).

(7) E.g., *tafḍaḥūni* (Q 15:68; following *muṣbiḥīna*), *suṭiḥat* (Q 88:20; following *nuṣibat*).

(8) E.g., *jamman* (Q 89:20; following *lamman*), *qamṭarīran* (Q 76:10; following *shukūran*) and *wahhājan* (Q 78:13, followed by *thajjājan*).

fHLu	Type	Suras	Sura numbers
3	K1	7	53, 68, 70, 78, 79, 80, 83
	K2	3	18, 54, 76
4	K1	3	56, 90, 100
	K2	3	19, 20, 37
5	K1	1	81
6	K1	1	55

3.3.1. Distribution of fHLu

If we split up the counts for each sura type, we can see that for early Meccan suras, the ayas with fHLu make up 5.82% of all ayas and that slightly more than two-thirds of the ayas containing HLu end with an fHLu! The latter ratio falls gradually to 36.26% for middle Meccan suras, 11.76% for late Meccan suras and finally to 6.98% for Medinan suras. It is worth noting that the number of HLu decreases from 111 to 97 and 78 in Meccan suras only to increase to 104 in Medinan suras, whereas the number of fHLu falls continuously from 71 to 33, then to 8, and eventually to 6.

Parameter	**Sura type**							
	K1		K2		K3		M	
	fHLu	total HLu	fHLu	total HLu	fHLu	total HLu	fHLu	total HLu
Suras	31	48	16	21	7	21	5	24
Ayas (A)	985	1.219	1.515	1.898	676	1.656	323	1.463
AHLu	102	105	78	91	37	68	31	86
HLu	108	111	82	97	43	79	36	104
fHLu	71		33		8		6	
fHLu:A	7.21%	**5.82%**	2.18%	1.74%	1.18%	0.48%	1.86%	0.41%
fHLu:AHLu	69.61%	**67.62%**	42.31%	36.26%	21.62%	11.76%	19.35%	6.98%
AHLu:A	10.36%	8.61%	5.15%	4.80%	5.47%	4.11%	9.60%	5.88%

These counts suggest a correlation between the main discriminative factor between revelation periods, i.e., the length of an aya in words and the number of fHLu that a sura contains. The significant results of the correlation test confirm that the shorter an aya is, the more likely it is to end with an fHLu. This becomes clearer when considering that early Meccan and middle Meccan suras together contain 196 ayas in which 208 HLu occur, half of which (104) are fHLu, so that only 14 fHLu are to be found in the typically longer late Meccan and Medinan ayas(1).

Correlation	All	Meccan	K1	K2	K3	Medinan
Pearson	-0.480	-0.487	-0.352	-0.333	-0.259	-0.197
Spearman	-0.582	-0.543	-0.302	-0.331	-0.270	-0.255
Kendall	-0.484	-0.456	-0.268	-0.279	-0.226	-0.212

We could group the suras according to their length in ayas to see that the shortest and early Meccan suras(2)

(1) Ibn ʿAbbās considered Q 22 (except for ayas 19-21), Q 47 (except for aya 13) and Q 61 to be Meccan; see Tilman Nagel, *Medinensische Einschübe in mekkanischen Suren* (Göttingen: Vandenhoeck & Ruprecht, 1995, pp. 102-107. Hence, the fHLu in Q 24:49 and Q 9:57 should be the only ones in Medinan ayas.

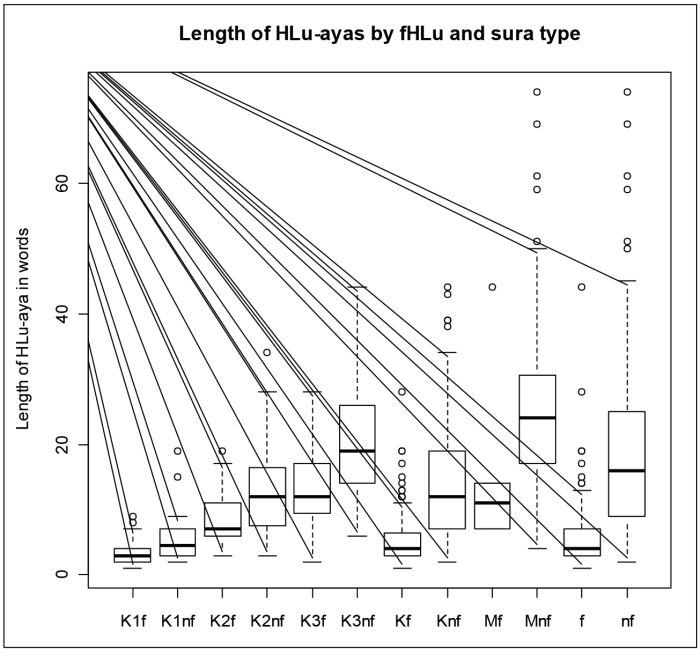
(2) Contrary to the Azhar classification, Nöldeke considers Q 55 and Q 99 to be early Meccan, Q 76 middle Meccan and Q 13 late Meccan and not Medinan.

(except for Q 49, Q 58-66, Q 98 and Q 110) contain the most fHLu (48 out of 118), while almost half of the fHLu (61 out of 118) occur in suras with a length of up to 50 ayas. Among suras with a length of up to 25 ayas, fHLu end 5.51% of their 472 ayas.

Sura length	Total number	Total number	Sura Type				Number	Ratio
in ayas	of suras (S)	of ayas (A)	K1	K2	K3	M	of fHLu	fHLu:A
0-25	41	472	29	0	0	12	26	5.51%
25-50	25	889	11	5	6	3	35	3.94%
50-75	16	925	6	2	6	2	17	1.84%
75-100	14	1.202	2	7	3	2	21	1.75%
100-125	8	914	0	4	3	1	8	0.88%
125-150	3	392	0	1	1	1	5	1.28%
150-175	1	165	0	0	1	0	0	0.00%
175-200	2	358	0	1	0	1	4	1.12%
200-225	2	406	0	0	1	1	1	0.25%
225-250	1	227	0	1	0	0	1	0.44%
250-275	0	0	0	0	0	0	0	0.00%
275-300	1	286	0	0	0	1	0	0.00%
Total	**114**	**6.236**	**48**	**21**	**21**	**24**	**118**	

Table 15: fHLu by sura length and sura type

If we group the ayas containing HLu subject to their ending on an fHLu or not and boxplot their length in words[1] against their revelation period, we can clearly see that ayas with fHlu are shorter than ayas that contain non-*fawāṣil* HLu.



(1) The word count of *Fihris iḥṣāʾ ʿadad kalimāt al-qurʾān al-karīm* (http://www.alargam.com/quran2/kalemat) was used.

3.3.2. Peculiarities of fHLu

It is worth mentioning that among fHLu, there are only 19 triliteral[1] finite verbal forms and one quadriliteral[2] finite verbal form and that the HLu of three unique patterns could be considered 'rhyming': *yafʿīl* (*yaqṭīn* in Q 37:146), *faʿwal* (*qaswarah* in Q 74:51) and *mufʿāll* (*mudhāmmatān* in Q 55:64), with the last one being flexion based. Nevertheless, if we go further and rely on the consonant text only, we can identify singular fHLu-endings, i.e., combinations of two graphemes occurring in an fHLu only.

There is a single aya ending with an fHLu bearing the only combination of YḌ (*ḥanīdh* in Q 11:69), ZB (*lāzib* in Q 37:11), CCL (*al-muzzammil* in Q 73:1), ṬT (*kushiṭat* in Q 81:11), ʿS (*ʿasʿasa* in Q 81:17), ZL (*bi-l-hazl* in Q 86:14), ḤT (*suṭiḥat* in Q 88:20), ĞĀ (*sajā* in Q 93:2), YŠ (*quraysh* in Q 106:1), YF (*wa-l-ṣayf* in Q 106:2) and MD (*al-ṣamad* in Q 112:2). Other special endings include rare consonants in the ultima, among which one can find three of the just-mentioned fHLu (unframed):

Ending	*fawāṣil*	fHLu	non-HLu
Ḍ	2	*ḥanīdh* [Q 11:69]	*majdhūdh* [Q 11:108]
Š	2	*quraysh* [Q 106:1]	*manfūsh* [Q 101:5]
F	3	*wa-ṣ-ṣayf* [Q 106:2]	*khawf* [Q 106:4], *mukhtalif* [Q 51:8]
Ḥ^{an}	4	*ḍabḥ^{an}* [Q 100:1], *qadḥ^{an}* [Q 100:2]	*sabḥ^{an}* [Q 79:3], *ṣubḥ^{an}* [Q 100:3]
Z^{an}	4	*rikz^{an}* [Q 19:98]	*juruz^{an}* [Q 18:8], *ʿazīz^{an}* [Q 33:25, Q 48:3], *mafāz^{an}* [Q 78:31]
S^{an}	3	*hams^{an}* [Q 20:108]	*yaʾūs^{an}* [Q 17:83], *libās^{an}* [Q 78:10]
BB^{an}	3	*abb^{an}* [Q 80:31]	*ṣabb^{an}* [Q 80:25], *ḥabb^{an}* [Q 80:27]
MM^{an}	2	*jamm^{an}* [Q 89:20]	*lamm^{an}* [Q 89:19]
CCah	5	*al-ṣākhkhah* [Q 80:33][3]	*muṭmaʾinnah* [Q 89:27], *marḍiyyah* [Q 89:28], *al-ḥāqqah* [Q 69:1, 2, 3], *al-bariyyah* [Q 98:6, 7]

Finally, to put these results into context and to show how special these fHLu are, we can say that no aya ends on the consonants Ḫ[4], Ġ[5] or W[6] (*in pausa*), while nearly three-quarters of all 6,236 ayas end on a long vowel followed by a consonant: 31.09% on *–ūC*, 36.20% on *–īC* and 5.48% on *–āC*. The final (ingeminated) consonant is N in 3,121 ayas (50.05%), M in 650, R in 443, D in 198, B in 161 and L in 67 ayas, while 946 ayas show an *alif* preceded by a *fatḥah* or *fatḥatān* as the last grapheme, indicating an ending on vocalic *–ā* (120: *-īrā*, 103: *-īlā*, 96: *-īmā*, 67: *-ūrā*, 40: *-yyā*).

(1) These are (ordered by their roots) *yajmaḥūna* (Q 9:57), *taḥīdu* (Q 50:19), *daḥāhā* (Q 79:30), *dassāhā* (Q 91:10), *yaziffūna* (Q 37:94), *sajā* (Q 93:2), *suṭiḥat* (Q 88:20), *ṭaḥāhā* (Q 91:6), *yataghāmazūna* (Q 88:30), *tafḍaḥūni* (Q 15:68), *tufannidūni* (Q 12:94), *inkadarat* (Q 81:2), *[wa-]akdā* (Q 53:34), *kushiṭat* (Q 81:11), *yatamaṭṭā* (Q 75:33), *[wa-]nḥar* (Q 108:2), *yahjaʿūna* (Q 51:17), *yūfiḍūna* (Q 70:43) and *waqaba* (Q 113:3).

(2) The only quadriliteral verbal fHLu is *ʿasʿasa* in Q 81:17.

(3) The fHLu *al-ṣākhkha^{tu}* (cf. *al-ṭāmma^{tu}* in Q 79:34) was counted as ending on *-ā* like its predecessors, but it starts a new sura-section (hence the difference); see Neuwirth, *Studien*, p. 220 and Crapon de Caprona, *Le Coran*, p. 294. Abdul-Raof regards it to be onomatopoetic; see Hussein Abdul-Raof, *Qur'an Translation: Discourse, Texture and Exegesis* (Surrey: Curzon Press, 2001), p. 124.

(4) There are few *fawāṣil* having Ḫ in their ultima: *akhi* (Q 20:30), *al-ṣākhkha^{tu}* (Q 80:33), *wa-akhkhar^{a}* (Q 75:13), *yataʾakhkhar^{a}* (Q 74:37), *wa-akhfā* (Q 20:7), *fakhūr^{un}* (Q 11:10), *fakhūr^{in}* (Q 31:18, Q 57:23), *wa-akhīh^{i}* (Q 80:34) and *wa-akhīh^{i}* (Q 70:12).

(5) Some *fawāṣil* have Ġ in their ultima: *fa-rghab* (Q 94:8), *lughūb^{un}* (Q 35:35), *lughūb^{in}* (Q 50:38) and *yaghīẓ* (Q 22:15) as well as (de)verbal forms of ṬĠY I; see Table 26.

(6) 21 ayas end on W followed by *alif maqṣūrah*: *fa-sawwā* (Q 75:38, Q 87:2), *al-hawā* (Q 53:3, Q 79:40), *hawā* (Q 20:81, Q 53:1), *istawā* (Q 20:5), *ghawā* (Q 53:2), *fa-stawā* (Q 53:6), *fa-ghawā* (Q 20:121), *li-l-shawā* (Q 70:16), *al-quwā* (Q 53:5), *al-maʾwā* (Q 53:15, Q 79:39, Q 79:41), *aḥwā* (Q 87:5), *al-najwā* (Q 20:62), *ahwā* (Q 53:53), *bi-l-taqwā* (Q 96:12), *li-l-taqwā* (Q 20:132) and *wa-l-salwā* (Q 20:80).

3.4. Conclusion

In this contextualization of Quranic studies in Austria, the very brief and recent history of Arabic studies proper in the German-speaking world was introduced, and some results of applying statistical methods to the Quranic text were presented.

Almost every second root (748/1,676) represented in the Quranic text (78,245 tokens) derives from a single word and nearly every fourth root (391/1,676) a single word that occurs once, out of which 377 are triliteral, 13 are quadriliteral and one is a multiliteral hapax legomena of unical roots (HLu). They occur in 86 suras, and one can say that the longer a sura is in ayas, the more HLu it is likely to contain. As HLu are distributed over 350 ayas, some ayas contain up to five HLu that can make up whole phrases such as *fa-khlaʿ naʿlayka* (Q 20:12), *wa-tallahū li-l-jabīn* (Q 37:103) or *khushubun musannadatun* (Q 63:4), which testifies to the fact that they are an organic part of the Quranic discourse. However, there are some peculiar words among this set of least frequent words, since some word patterns are only witnessed through HLu, e.g., *fuʿlūl* (*ḥulqūm, khurṭūm, ʿurjūn*), *faʿwal* (*qaswarah*), *fuʿālil* (*surādiq*), C_1uC_2 (*thubāt*), *faʿlalīl* (*qamṭarīr, zamharīr, zanjabīl, salsabīl*), *yafʿīl* (*yaqṭīn*) and *mufʿāll* (*mudhāmmatān*). Among finite verbal forms, *nasfaʿan* stands out as one of two certain energetic forms without *shaddah*. With regard to the employment of rare words as rhyming words, while almost 75% of the Quranic ayas end on a long vowel followed by a consonant, *fāṣilah*-HLu (fHLu) add a variety of very rare sound combinations to end an aya. Almost every third HLu is an fHLu, the overwhelming majority of which occur in early Meccan and middle Meccan suras, which makes one in twenty early Meccan ayas rhyme on a hapax; more notably, two-thirds of the hapaxes in early Meccan suras are in a rhyming position never used another time in the Quranic text.

Bearing in mind that the academic study of Arabic in Europe is rather a new venture and that there was not even a proper list of hapax legomena in the Quran until 2001, the results of Ambros's and my own work should drive people towards exploring the Quranic text and its parameters further by applying methods of corpus and quantitative linguistics. The quantitative and computational study of the Quran is still in its infancy, as is that of Arabic literature in its entirety, and there is a whole new world of discoveries to be made. To illustrate this by mentioning but a few studies in this field, one can refer to Nora Schmid's quantitative analysis of syllable count in the Quran in the context of the chronology of revelation and considering the sura a literary unit(1), Behnam Sadeghi's stylometric analysis of the chronology of revelation(2), and a comprehensive paper on the automatic extraction of keyness and its prosodic encoding in the Quran by Claire Brierley, Majdi Sawalha, Tajul Islam, James Dickins and Eric Atwell(3). These are brilliant examples of scholarship, and there is still much work to be done and progress to be made to further study the Quran (and the Arabic language and literature in general) in light of contemporary methodologies and the technology available to us in the 21st century.

(1) Schmid, Nora. K., 'Quantitative Text Analysis And Its Application To The Qurʾan: Some Preliminary Considerations', in Angelika Neuwirth, Nicolai Sinai, and Michael Marx (eds), *The Qurʾan in Context* (Leiden: Brill, 2009), 441-459.

(2) Sadeghi, Behnam, 'The Chronology of the Qurān: A Stylometric Research Program'. *Arabica* 58/3 (2011): 210–299.

(3) Claire Brierley et al., 'Automatic Extraction of Quranic Lexis Representing Two Different Notions of Linguistic Salience: Keyness and Prosodic Prominence'. Journal of Semitic Studies LXIII/2 (2018): 407-456.

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