The Effect of Morphological Awareness on Reading Qur'anic Words and Pseudo-Words: A Case Study of English-Speaking Qur'an Learners

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ABSTRACT:

Original Paper

Research findings have shown that acquiring proficiency in reading is highly dependent on morphology. Also, it has been proved that morphology is a stronger determiner and predictor for reading in Semitic languages such as Arabic. Due to the fact that Qur'anic reading is an important skill for the Muslim community and the gap in the literature on Qur'anic reading, the current research is an attempt to study the effect of morphological awareness on Qur'anic reading fluency and accuracy. To this aim, an intact group entailing 29 native English-speaking adults (aged 19-43) enrolled in a lower-intermediate Qur'anic course was selected through purposive sampling in which outliers were removed (N=27). The remaining participants underwent three sessions of morphological instruction on some of the challenging and frequent Qur'anic roots and morphemes and then took part in three different reading tests on a standard Arabic text, a pseudo-word text, and a Qur'anic text. The results of an analysis through ANOVA (F (2, 72) = 67.483, p = .000) showed that the group performed differently in the three tests, i.e., the morphology instruction enhanced their performance in reading the Qur'anic text as well as the standard Arabic text while leaving the performance on the pseudo-word text almost unaffected. The post-hoc test showed that this effect was strongest in the Qur'anic test, revealing that Qur'anic reading is

significantly affected by morphological awareness-raising. This indicates that raising awareness of morphology through instruction promotes the reading of difficult languages such as the Holy Qur'an and standard Arabic. These findings have implications for Qur'anic teachers, learners, and Arabic language practitioners.

1. Introduction

Evidently, reading in any language requires a complex set of skills that work together and help language learners to identify and decode the printed words and then decode meaning and comprehend the text (Cain 2010). Some of these skills, such as word recognition, rest on the phonological aspects of language, while reading comprehension is dependent on the semantic aspects of language. However, in addition to these skills, gaining knowledge of the forms (morphs) of any language, especially those languages that are root-based, has a determining role in reading fluency and accuracy (Silverman et al. 2013). A bulk of research conducted on Semitic languages in the past decades has underscored the critical role of morphology in different linguistic aspects such as semantics and pragmatics as well as in different linguistic functions such as spelling, reading, and writing (Awwad & Mimran 2024). Yet, among other linguistic competencies, reading is more dependent on morphology compared with other language skills since it is interlocked with phonology and production operations, burdening cognitive processing (Issa 2022).

In line with the same assertion, in the previous decades, a number of studies conducted on Arabic reading have reported that the morphology of Arabic contributes fundamentally to its reading and spelling systems because it is a root-based language. Building on this understanding, this study investigates how morphological awareness impacts the reading fluency and accuracy of Iranian learners when engaging with Qur'anic texts, Arabic pseudo-words, and standard Arabic.

To underline the importance of the current research, it is worth mentioning that Prunet et al. (2000), Ravid and Malenky (2001), Abu-Rabia (2002), and Abu-Rabia and Taha (2004) have argued that in spite of the fact that decoding vowelized Arabic words can be carried out consistently on the basis of grapheme-phoneme conversion, which is not apparently concerned with a word's morphological formation, the identification of non-vowelized Arabic words cannot be processed simply without morphological information. In addition to that, Arabic is a Semitic language in which word

identification is dependent on the identification of word roots for prime lexical access, which subsequently leads to the retrieval of the missing phonological information and accurate word pronunciation (Abu-Rabia 2002). This is in line with Tibi (2016), who postulates that morphological and phonological awareness are among the linguistic and cognitive factors involved in Arabic reading accuracy and fluency. Morphological awareness is the ability to relate word components and their roles, such as nominal pattern, root, verbal pattern, and affixes (Frost 1994), knowing the internal structure of words and the rules for creating them (Bishara 2020), as well as the ability to reflect on and manipulate these structures (Carlisle 1995). Morphological awareness resides in morphology, which is a major sub-discipline in linguistics. In this regard, Yule (2006) states that morphology encompasses the smallest meaningful unit of a word (morpheme), which may be as short as a single letter, such as *tā'* for the feminine form in Arabic, or a whole word such as *walad* (child). It is worth noting that pseudo-words are letter strings that do not have meaning but are pronounceable since they conform to the orthography of the language (as opposed to non-words, which are not pronounceable and have no meaning). Pseudo-words are only used in language for instructional purposes, as is the case in the current study.

2. Literature Review

A scant review of the literature reveals that in alphabetic languages such as Arabic, phonological awareness is the strongest predictor of literacy proficiency and reading fluency and accuracy (Melby-Lervag et al. 2012); however, a good bulk of literature has also proved that morphology serves as a core skill in literacy and reading development. For instance, Bowers and Kirby (2009) believe that in the triangle model of word-reading suggested by Seidenberg and McClelland (1989), morphology has a critical position because morphological knowledge is a plausible constituent binding agent and therefore serves as a lexical representation glue that contributes to and strengthens knowledge of word meanings. Therefore, morphology is a critical component for the study of Arabic because word structure in this language is morphemic, meaning that almost all Arabic words are derived by means of combining at least two bound morphemes, including roots and word patterns. Though a good bulk of studies has been conducted on the importance of morphological, phonological, and syntactic awareness in promoting different aspects of Arabic, including reading, almost all these studies have been conducted on eloquent standard Arabic.

Thus, morphology provides meaningful cues for readers, allowing them

to analyze unknown words by breaking them into their morphemes and synthesizing these into meaningful units. Research has shown that morphological awareness is closely linked to literacy skills, particularly reading (Carlisle 2000; Roman et al. 2009; Kirby et al. 2012). At the same time, some studies conducted on Arabic have shown that readers of Semitic languages such as Arabic are sensitive to the morphological structure of a word, meaning that the representation of words in their mental lexicon is morpheme-based (Ravid & Malenky 2001). In addition, some scholars have reported that morphological awareness has a direct influence on reading fluency, reading accuracy, and even reading comprehension, among them Deacon et al. (2013) and Tong et al. (2014).

Although morphological awareness was neglected in a number of reading models and hypotheses developed around reading skill, such as Seidenberg and McClelland's tripartite model (1989), in later models and theories it was given more centrality. For instance, Perfetti (2007), in his lexical quality hypothesis, stipulated that the quality of the lexical representations learners develop about lexical units exerts an influence on the efficiency with which words are retrieved during reading. Later, Verhoeven and Perfetti (2011) gave a more cardinal role to morphology in decomposing poly-morphemic words and enhancing the lexical quality of words, particularly complex words. After establishing the position of morphological awareness in reading skills, the next wave of research on this relation was devoted to the assessment of morphological awareness. According to Tibi (2016), morphological awareness can be assessed through a wide range of tasks across spoken and written language with different levels of complexity, in a way that some tasks demand composing words out of morphemes while others demand decomposing a morphologically complex word into its constituent morphemes. Semantic judgment and semantic relatedness are also two themes on which these tasks are carried out.

Considering the issues mentioned above, a number of studies were conducted in the Arabic language investigating the effect of morphological awareness on different aspects of reading. Here, we briefly review some of these studies. Elaborating on the role of morphology in Qur'anic language processing, Bashir et al. (2022) carried out a systematic review study to bring to light the latest advancement in Qur'anic reading processing tools, data sets, and approaches. It was revealed that these technologically based advancements not only raise reciters' morphological awareness but also help in modifying or correcting ill-formed patterns through speech recognition intelligence. An evident drawback in this research is that the application of these advancements in real educational settings is not discussed. Also,

Bishara (2020) investigated the association between phonological and morphological awareness on one hand, and reading comprehension on the other, in Arab elementary schools. The research findings revealed that the higher the level of phonological awareness in Arabic, the better their reading comprehension. Also, it was found that the higher the level of morphological awareness in Arabic among learners, the better their reading comprehension level. Yet, it is not known whether morphological awareness alone (unaccompanied by phonological awareness) can bring about the same effects on children. Also, the generalization of these findings to normative Arabic learning is not discussed in the study.

Tibi (2016) investigated the role of morphological awareness in reading. In the first round of Tibi's study, 10 morphological awareness measures and two reading measures were developed and tested on a sample of one hundred and two Arabic-speaking children. Factor analysis of the 10 morphological awareness tasks resulted in one predominant factor, supporting the construct validity of morphological awareness in Arabic. Besides, hierarchical regression analyses indicated that the morphological awareness factor solution accounts for forty-three percent of the variance in reading. The relative merit of this study lies in the fact that the interaction of cognitive skills and linguistic processing is also discussed. However, the findings are reported in an experimental setting. Thus, the generalization of findings to real educational contexts remains a vital issue. Furthermore, Al-Musawi (2014) studied the role of phonology, morphology, and dialect in reading Arabic. The findings of this study, which was carried out on children with Arabic as their native language, revealed a significant superiority of phonological awareness as the predominant predictor of all literacy skills across children but also showed that morphological awareness is a predictor of first-graders' spelling ability and was subsequently implemented to predict all the literacy skills of second-graders. However, it is not discussed whether these pedagogic findings can be securely generalized to andragogy and normative settings. Also, dialect served as a mediating variable, one without which the findings might change dramatically.

Last but not least, Abu-Rabia (2006) investigated the effect of morphological knowledge among normal readers and readers with dyslexia and found that readers with dyslexia experience difficulty with morphological knowledge, and this manifests in several ways, depending on the awareness and modality of knowledge being tested. It is then discussed that morphological-orthographic proficiencies, including familiarity with word structure and the ability to distinguish root letters and affixes, which help store words in a mental orthographic lexicon, affect reading. An epistemological flaw from which this research suffers is the assimilation of

cross-cultural findings. Also, from a methodological viewpoint, the effect of different variables is reported monolithically, while morphology and orthography are two distinct variables affecting reading, as depicted by Wadi (2020), who postulated that the effect of orthography on text interpretation is a distinct phenomenon.

A review of the literature shows that none of the studies conducted on the role of morphological awareness in reading has selected second language learners for their investigations. In addition to that, none of the studies conducted on the Arabic language has investigated the effect of morphological knowledge on reading religious texts such as the Holy Qur'an. For the same reason, the current research is an attempt to delve into this effect among Iranian Qur'anic learners through a quasi-experimental design.

3. Method

The present study has adopted a quantitative approach via the agency of a quasi-experimental study in which three experimental groups participated in an intervention, post-test-only research design.

3.1. Participants

Participants of this study were selected from a Qur'anic center in the city of Qom in which Arabic language and Qur'anic skills, including reading, recitation, and interpretation, were taught simultaneously to foreign learners of the Qur'an living in the city of Qom. In total, 27 Qur'anic learners registered in the lower-intermediate level were selected based on purposive sampling procedures. The logic behind using purposive sampling resides in the fact that these groups of learners could provide the richest data for answering the research questions. These participants, aged 19 to 43, were studying different disciplines of Islamic and Qur'anic sciences in Qom's seminary schools. Aiming at homogenizing the sample, a trainer-developed Qur'anic test of reading selected from the 30th chapter of the Qur'an was administered to this group, as a result of which two learners whose scores were two standard deviations beyond the sample mean were deleted as outliers.

3.2. Instruments

The major instrument employed in this study was the morphological awareness taxonomy adopted from Deacon et al. (2008), which served as

the framework for intervention. In other words, the instruction of the trainer in the intervention phase was based on this taxonomy, which is shown in table 1.

Table 1. Morphological awareness intervention on the basis of Deacon et al. (2008).

Composition	- Word analogy (standard/local) - Sentence analogy - Morphological relation judgement - Morphological Composition - Sentence Selection - Sentence Completion
Decomposition	- Word analogy (standard/local) - Sentence analogy - Word analysis - Morphological relation judgment - Morphological Production through Decomposition - Sentence Selection

In addition, the list of pseudo-words (Appendix I) and eloquent (standard) Arabic words (Appendix II) were adopted from Tibi (2016), while the list of Qur'anic derivations (Appendix III) was adopted from Khoshmanesh (2009), as shown below:

3.3. Procedure of the Study

After selecting the participants of the study, homogenizing them, and determining the core roots for intervention (see Appendices I, II & III), the participants received a morphological instructional intervention for three intensive sessions. The rationale for limiting the intervention phase to three sessions was that the instruction was kept within the bounds of the adopted scales (the roots and pseudo-words represented in the three appendices) rather than general and normative morphological instruction. Each session lasted 60 minutes in the form of a teacher-fronted classroom, wherein metalinguistic information regarding the morphology of the selected lexical items, suffixation, infixation, lexical roots, bound morphemes, free morphemes, etc., was presented through an explicit approach. A mechanical post-task activity in each session evaluated learning. Any error or ill-formed performance during the class was noticed and corrected by the teacher. The intervention was centered on the theoretical framework of Deacon et al. (2008) and encompassed the composition and decomposition tasks on the roots extracted from the adopted scales.

Then, in the post-test, the participants were administered three reading

tests in three successive sessions, including a test developed from the core words, a test from Qur'anic verses centered on the roots, and a reading test based on pseudo-words listed in Appendices I, III and II, respectively. All three reading tests were developed by the researcher, but their face and content validity were commented on by an Arabic associate professor at Razi University. Also, the reliability of the tests was already estimated in three successive pilot studies employing non-native Arabic speakers at a seminary school in the city of Qom, using Cronbach's Alpha (r = 0.68, 0.74, and 0.69, respectively). Each test encompassed 20 items, resulting in a parametric score ranging between 0-20. This quasi-experiment was conducted during the first semester of the seminary schools in the city of Qom in 2024.

3.4. Data Collection and Analysis

All three Arabic reading tests produced a score between zero and twenty. Accuracy, fluency, and speed of reading were the major criteria for scoring. The scores of Qur'anic learners in all three tests were collected and entered into SPSS (version 21). The mean scores of these tests were compared through a one-way analysis of variance (ANOVA). The rationale for using ANOVA was that three independent observations were made, and it was intended to determine any significant difference between the mean scores obtained in these observations (tests). Our dependent measure (tests) was continuous, and our independent categorical variables (groups) had more than two levels that meet critical assumptions of the measure. Outliers were already removed, and observations in the three different tests were independent, i.e., performance in each test did not affect performance in the other. Assumptions of normal or approximately normal distribution of the independent variable were affirmed. A drawback of one-way ANOVA is that the test is omnibus; thus, while determining the existence or non-existence of a significant difference between the groups, it does not determine exactly where the difference lies. In order to determine which test score is significantly different from the other test scores, a post hoc test (Tukey) was employed.

4. Results and Discussion

In order to answer whether raising awareness of morphological structures affects the reading of Qur'anic learners, an experimental study (intervention-post-test-only design) was carried out on Iranian lower-intermediate Qur'anic learners. The scores associated with the performance of the participants were collected and analyzed through ANOVA. The

results of the analysis are presented in table 2 & 3.

Table 2. One-way analysis of variance for the groups on three tests

	Sum of Squares	Df*	Mean Square	F	Sig.
Between Groups	361.707	2	180.853	67.483	.000
Within Groups	192.960	72	2.680		
Total	554.667	74			

*df = Degree of Freedom

As can be seen in Table 2, there was a statistically significant difference between the group's performances on three tests as determined by one-way ANOVA (F (2, 72) = 67.483, p = .000). Also, conducting multiple comparisons through a Tukey post hoc test revealed that the performance of participants in the Qur'anic test was significantly higher than their performances on the Pseudo-words test (p = .00) and the standard words test (p = .000); however, there was no statistically significant difference between performance on the standard words test and the pseudo-words test (p = .989), showing that raising awareness of Qur'anic morphemes directly affects Qur'anic reading more than two other kinds of readings. This means that raising awareness of the morphological structure of Qur'anic words promotes Qur'anic reading among lower-intermediate learners in Iran.

Table 3. Result of multiple comparison for three performances of the participants (Tukey HSD).

I Groups	J Groups	Mean Diff	Std. E	Sig	95% CI	
					LB*	UB**
Standard Test	*Qur'anic Test*	-4.400	0.463	**0.000**	-5.51	-3.29
	Pseudo-Words Test	0.480	0.463	**0.556**	-0.63	1.59
Qur'anic Test	*Standard Test*	4.400	0.463	**0.000**	3.29	5.51
	Pseudo-Words Test	4.880	0.463	**0.000**	3.77	5.99
Pseudo-Words Test	*Standard Test*	-.480	0.463	**0.556**	-1.59	0.63
	Qur'anic Test	-4.880	0.463	**0.000**	-5.99	-3.77

*LB = Lower Bound **UB = Upper Bound

The findings of this study revealed that instructing Qur'anic learners with the composition and decomposition of Qur'anic morphemes promotes the reading fluency and accuracy of Qur'anic learners in the context of the study. The results obtained confirm Lotfi Gaskaree et al. (2023), reporting that analyzing lexical bundles in the form of suffixes or independent items promotes usage-based and use-based linguistic competence of language learners, particularly in Qur'anic language that is lexically sophisticated.

These findings are also in line with previous studies conducted on the English language, such as Berninger et al. (2010), Nagy (2007), and Stahl and Nagy (2006), reporting that morphological awareness contributes to accurate and fluent reading to a meaningful extent. Also, these findings are consistent with Tibi (2016) in Arabic, which confirmed that morphology has a determining role in the reading skill of Arabic learners, and also endorsed the substantial empirical evidence in other languages concluding that morphology is an independent and powerful determiner in Arabic reading.

Furthermore, considering the fact that the current study adopted an intervention-based design, the findings obtained support other intervention-based experimental studies conducted on other languages, including Elbro and Arnbak (1996), Goodwin and Ann (2013), and Quémart and Casalis (2015), which showed that morphological awareness exerts a positive effect on reading skills such as fluency, accuracy, and comprehension.

In addition, these findings confirm Almusavi (2014), who submitted proof of the predictive contribution of morphological awareness on the development of Arabic literacy and education among cognitively able and cognitively deficient Arabic learners, despite their age. Last but not least, the findings of the current research support a huge bulk of studies conducted on Semitic languages (Mahfoudhi et al. 2010), in which the role of morphology in reading was emphasized.

Why participants outperformed in reading the Qur'anic text compared with two other reading tests is subject to explanation from a couple of perspectives; attitudinal and linguistic. The difference between Qur'anic text performance and Arabic text performance was not statistically significant. From an attitudinal perspective, this subtle difference might be attributed to the inherent Muslims' attentiveness and heedfulness to the Holy Qur'an during reciting or reading it, rather than technical differences between the two sets of texts or the effect of the instruction on them. This means that this inherent tendency toward Qur'anic texts might be a source of measurement error or scoring bias that cannot be controlled through similar experiments. Supriyadi and Julia (2019) stand firm behind this explanation.

However, why Qur'anic and Arabic test performances were significantly better than performance on pseudo-words has a linguistic explanation. According to Issa (2023, 334), Arabic word processing proceeds in a hierarchical way through which lexical items are accessed and then interpreted based on root or stem (morphological decomposition). This naturally decreases the cognitive load of working memory and attention pools in favor of accuracy, fluency, and speed. Since pseudo-words lack

basic standard roots, stems, and critical suffixes, the instruction does not exert a significant effect on their reading.

5. Conclusion

This study was intended to answer whether raising awareness of the morphology of Qur'anic language promotes reading fluency and accuracy in Qur'anic learners. Considering the fact that the Qur'anic language follows the rules of Semitic languages, it is heavily dependent on phonology — especially in Qur'anic reading (Farokhipour et al. 2019) — and morphology, and the morphologically-rich instruction in the present experiment had a significant effect on reading. The current study has implications for Arabic instructors, Arabic learners, and above all, Qur'anic practitioners. The primary implication is for language teachers, who could consider integrating morphological knowledge in cognitively-demanding linguistic performances such as reading fluently and accurately. This can also internalize the knowledge of Qur'anic learners about Arabic forms, which is contributive to learning other Qur'anic skills such as comprehension, translation, interpretation, etc. Besides, among other implications of the current research is the inclusion of morphologically loaded activities in regular Arabic and Qur'anic teaching, since knowledge about forms of language can enrich knowledge of other aspects of language such as semantics, pragmatics, and rhetorical conventions involved in text construction. These findings can also be used in teacher talk research and practice, and therefore have implications for researchers and practitioners too.

Unlike any other research, the present study had some limitations. Thus, several suggestions for future research are proposed to address these limitations. The current study used an intact group through purposive sampling. Future research can sample from a greater population and context to secure greater generalizability of its findings. Also, the inclusion of more learning and learner variables, such as other language skills, psychological traits such as anxiety and motivation, are suggested. It is also suggested to examine the effect of morphological knowledge on other aspects of Qur'anic education such as syntax, semantics, discourse analysis, etc. Furthermore, the current study employed a post-test-only control group design due to time and expense limitations. Further studies are suggested to use a pre-test/post-test design in which the amount of effect can be traced with more confidence.

Acknowledgements

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Appendices

Appendix I. List of Standard Arabic words adopted from Tibi (2016)

في، أنا، كان هو، الله، الصف، ماذا، الكتاب، الذي، أقرأ، الأطفال، الأرض، تحتها، معلمي، الملونة، الفتى، سيفعل، الأسئلة، المدينة، بطاقة، المفاهيم، عَنْكَبوت، الصحة، رَئيس، يستخدم، نهاية، أتذكر، أعجبتني، مسرحية، أزهارا، عبارتين، اختراع، شاطئ، الآخرين، كثيرا، يحفظها، دائرة، الرياضية، إضاءة، الجائعة، تنبعث، زملائي، وظيفتها، قررت، خمسين، المتسابقون، التخصصي، أتأمل، مُسْتَطيل، المؤلفون، رأسيتان، حياتنا، سريره، عزيمتك، ليعالج، استفدت، يناقش، يحللها، أشْتَرَى، استمعت، القرويين، مبصرا، لاحظنا، المستشفيات، يتفاءل، الرحالتان، الإيماءات، ينشدون، شلالات، وجوههم، ضوء، صائمين، أضحى، الخضراوات، قارئ، سيكررن، ليبيعها، اصبروا، مقترحاتكم، ليستيقظ، المسوَّرة، إقليميا، الدواوين، ترنَّموا

* All these words appeared in the tasks in a vowelized form

Appendix II. List of Pseudo-Words adopted from Tibi (2016)

غَيقاءُ، ضَقُ، طحاضمُ، فا شَ، تجاعش، ذيصَ، ارتعى، شَكك، اجلود، رَوَخَنُ، جحجبى، سُوَيحُ، هنلاع، خُوَيئُف، يسترب، الصُكام، سنستغيرج، أريضَفَ، تقامجت، غَريفا ت، نويطروما، صُقيراوانُ، فرنتظحنا، الدَمارات، جُبَيهَلوم، مُؤوس، يَبيراماً، غَريحَةُ، ثامح

* All these words appeared in the tasks in a vowelized form

Appendix III. List of some Qur'anic roots adopted from Khoshmansesh (2009)

Qur'anic Root	Qur'anic Example
ق ف ل	أَفَلا يَتَدَبَّرُونَ الْقُرْآنَ أَمْ عَلَى قُلُوبٍ أَقْفَالُهَا
غ ف ل	وَلا تُطِعْ مَنْ أَغْفَلْنَا قَلْبَهُ عَنْ ذِكْرِنَا
غ ل ف	وَقَالُوا قُلُوبُنَا غُلْفٌ بَلْ لَعَنَهُمُ اللَّهُ بِكُفْرِهِمْ فَقَلِيلا ما يُؤْمِنُونَ
ا ل ه	لَوْ كان فيهما آلِهَةٌ إلَّا اللهُ لَفَسَدَتا
ف ر ق	فَكَانَ كُلُّ فِرْقٍ كَالطَّوْدِ الْعَظِيمِ
ق ب س	انْظُرُونَا نَقْتَبِسْ مِنْ نُورِكُمْ
ق ب ض	وَيَقْبِضُونَ أَيْدِيَهُمْ
ا ب و	كَما أَخْرَجَ أَبَوَيْكُمْ مِنَ الْجَنَّةِ
ر ا ى	مِنْ حَيْثُ لا تَرَوْنَهُمْ
ق ط ر	سَرابِيلُهُمْ مِنْ قَطِرانٍ
ق ل د	لَهُ مَقَالِيدُ السماوات وَالْأَرْضِ
ق ن و	نُخْرِجُ مِنْهُ حَبًّا مُتَراكِبًا وَمِنَ النَّخْلِ مِنْ طَلْعِها قِنْوانٌ دانِيَةٌ
ك ف ت	أَلَمْ نَجْعَلِ الْأَرْضَ كِفَاتًا
ك ه ف	أَمْ حَسِبْتَ أَنَّ أَصْحَابَ الْكَهْفِ وَالرَّقِيمِ كَانُوا مِنْ آيَاتِنا عَجَبًا
م س ك	خِتَامُهُ مِسْكٌ وَفِي ذَلِكَ فَلْيَتَنافَسِ الْمُتَنافِسُونَ
ه ج ر	وَاهْجُرْنِي مَلِيًّا