

Developing an Informal-Formal Persian Corpus: Highlighting the Differences between Two Writing Styles

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Abstract

Informal language is a style of spoken or written language frequently used in casual conversations, social media, weblogs, emails and text messages. In informal writing, the language undergoes some lexical and/or syntactic changes varying among different languages. Persian is one of the languages with many differences between its formal and informal styles of writing, thus developing informal language processing tools for this language seems necessary. In the present paper, the methodology in building ParsMap, a parallel corpus of 50,000 sentence pairs with alignments in the word/phrase level is described. The resulting corpus has about 530,000 alignments and a dictionary containing 49,397 word and phrase pairs. The observed differences between formal and informal writing are explained in detail.

Keywords: Colloquial Language, Corpus, Informal Writing, Persian.

1. Introduction

Informal language is more common when we speak. However, there are times when writing can be very informal, for instance, in weblog posts, social media comments, and text messages. Informal writing is in fact a reflection of linguistic features of colloquial speech in our written materials.

Informal Persian is different from its formal form both lexically and syntactically. It is not a sociolect, i.e. everybody from every social level uses it in the casual situations. A large amount of colloquial Persian data is created every day in the cyberspace and the media, thus developing informal language processing tools for this language seems necessary. Forming a Persian informal-formal parallel corpus will enable computer engineers and computational linguists to develop tools for converting these two styles automatically or process texts in both styles with a strong performance.

2. Related Work

There are several studies on Persian informal language. Most of them have tried to suggest a uniform orthography for informal language. Tabibzadeh (2020), among all, reviews 112 Persian novels and dramas written over 100 years. He chooses 1697 informal words randomly out of these works and based on them, he categorizes and explains the features of informal Persian. Since all his data comes from the books, they have partly approved forms by the authors and editors. However, the situation is different in the virtual space where the people break the linguistic norms and try to show their feelings through the words by creating new forms.

Moreover, there are some researches on converting Persian colloquial texts into formal ones. Armin and Shamsfard (2011) and Naemi et al. (2021) propose rule-based systems which only cover a small part of the data. In addition, they just handle the lexical changes and syntactic ones are left.

Rasooli et al. (2020) suggest an automatic method for standardizing colloquial Persian text. Their core idea is training a sequence-to-sequence translation model translating colloquial Persian to standard Persian. They have annotated a publicly available evaluation data consisting of 1912 sentences.

Abdi Khojasteh et al. (2020) propose a dataset for Large-Scale Colloquial Persian (LSCP) containing about 120M sentences from twitter for machine translation with universal and treebank-specific POS tags with dependency relations and translations in five languages. In order to annotate the datasets, they adopt a semiautomatic crowd-sourcing method.

Kabiri et al. (2022) develop an Informal Persian Universal Dependency Treebank (iPerUDT) with a total of 3000 sentences from Persian blogs and mention a few differences between formal and informal Persian.

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Although LSCP and iPerUDT can be used to study the colloquial Persian in lexical and syntax levels, they are not parallel corpora and have no formal counterparts for informal data, therefore they cannot be directly used for inter-style conversions.

As is noticeable, the available resources and tools are insufficient for covering all aspects of this issue either due to applying rule-based methods and having limited rules or due to using data-driven methods with limited or incomplete data. Therefore, a converter with a big dataset which can transform informal into formal language in both lexical and syntactic levels is needed to fill this gap. This article is a report of an attempt to build this dataset. Moreover, the differences between formal and informal Persian writing styles will be reported in details. We are not going to propose a standard orthography for informal Persian, however, studying these differences and making parallel corpus of these two language styles help linguists with developing uniform and regulated grammar and orthography for informal Persian.

The article is organized as follows: the next section briefly introduces Persian language and its informal style. Section 3 explains the procedure of building this informal dataset. Section 4 explains the differences between formal and informal Persian. Section 5 represents the results and in the end, section 6 concludes the paper with pointing out the conclusions and further works.

3. Informal vs. Formal Persian

Persian is a pro-drop language with canonical SOV word order which is written in Arabic script with some small adjustments. In this script some letters are written connected to their adjacent ones and short vowels do not normally appear in writing. Persian informal language is different from formal in many ways. In order to build a comprehensive corpus covering syntactic and lexical dimensions, we need to know the characteristics of Persian informal language and its writing style.

Informal writing style has some general characteristics including making use of interjections, more idiomatic and conversational expressions, contractions, and

imprecise words. Moreover, sentences are shorter since appositive phrases and complicated structures are not normally used in the informal language, whereas both fragments and run-on sentences are acceptable. People break some rules of standard writing style and devise different writing methods to be able to convey the tone along with the meaning as far as possible.

Apart from the fact that informal Persian is associated with particular choices of grammar and vocabulary, there are many formal words and expressions changing in informal language. Persian informal writing style is often called *shekæste-nevisi* literally translated as “broken-writing”, indicating that some formal words are cut down in informal Persian. In some others the pronunciation of a letter changes. In the present study, typical informal language used by Iranians has been considered and its informal writing style has been investigated in detail to develop the dataset.

4. Developing the Dataset

In this section we discuss our methodology in extracting candidate sentences, choosing appropriate ones, transforming them into formal sentences and making the alignments.

4.1 Extracting Informal Sentences from Available Resources

Sentences could be either selected from external sources or generated by the data linguists. In order for the linguistics teams to have access to a great variety of sources, they were provided with texts derived from online crawling of social networks, websites and blogs as well as some scripts of books, screenplays and movie subtitles. Before distributing the sources among team members, fonts were standardized and texts were normalized as far as possible.

There were other sources including different messengers and everyday conversations that could be considered by the linguistics teams. Since the study aimed to cover all styles of writing, we attempted to use every sources reasonably, depending on the level of usage. Table 1 shows the distribution of external sources and the number of informal sentences extracted from each one.

source of data	# of extracted sentences
instagram	9,625
twitter	7,000
web pages	293,426
weblogs	26,146
books	124,130
movies	179,290
total	639,617

Table 1. Sources of informal sentences and their distributions

In order to extract data, pages were crawled and sentences with the length of 26-40 tokens (space separated) including at least 4 informal words were selected. As a result, about 640,000 informal sentences were provided to the linguistics teams for searching the proper data. Finally, 50,000 sentences were selected or generated and entered into the dataset. More than 50% of them were reviewed and corrected or confirmed by two linguist leaders.

4.2 Software Tool for Data Gathering and Preparation

Aiming to create the dataset, a software tool was developed letting the users enter data records. Each record included an informal sentence, its formal equivalent and their alignments in word and phrase levels. For each record, time and date of data entry, the data provider and the source of the informal sentence were saved and were searchable.

In order to speed up the development process, the system employed some automatic methods for suggesting the alignments using the previous found alignments, according to their frequency of occurrence and the context of the aligned word. The annotators checked the system's alignment suggestion to accept or correct it.

The tool managed data entry, data revision and confirmation, report generation, accounting, upload and download of raw and annotated corpus and some automatic data processing tasks for data verification and generation. For example, normalizing input sentences, checking for missing or inconsistent alignments and suggesting alignments were among automatic data processing tasks of the developed software. Fig. 1 shows a screenshot of data entry in this tool.

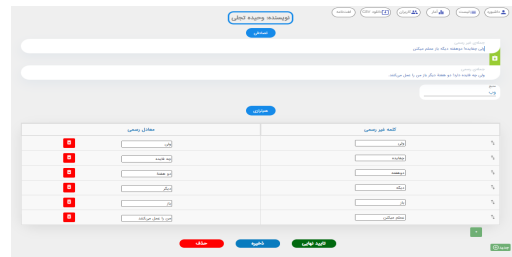


Figure 1. An entry of dataset in the data gathering software

The data is available at:

<https://drive.google.com/drive/folders/1dgcDO1y0VUSemq1jJbcxTu72D2KNckEy?usp=sharing>

4.3 Data Entry

Exploring the resources and spotting the linguistic points, we began to highlight the features of Persian informal language. 50,000 pairs of formal-informal sentences with specified alignments were supposed to be entered into the dataset. In order to decide the formal alignment, minimum changes were made and paraphrasing was not applied. Slang words and phrases were not replaced. There were a few expressions and utterances with no near formal equivalents; for these cases a negotiated equivalent was chosen. Formal sentences were entered with correct punctuations.

The style of writings seemed mostly to be affected by age, education level, and social group membership of language users. We attempted to cover all the levels as far as possible. As previously mentioned, many Persian words including the largest number of verbs have an abridged informal form. They were all replaced by formal word forms.

Rare mistakes like uncommon spelling mistakes in informal sentences were edited before entering but common mistakes were kept and edited in the formal equivalents. Some common spelling mistakes are the result of having more than one character for a sound in the Persian alphabet. The frequent ones were included. In addition, some characteristics of informal language including vowel lengthening which is converted to vowel repetition in writing for showing emphasis, surprise and other feelings were kept in informal sentences and edited in formal ones. As a matter of fact, it

can be a shortcoming since we did not convey the feelings to the formal equivalents.

The last point is that Persian has two personal pronouns for singular address. It employs the second-person plural *shoma* instead of the singular *to* as a sign of respect. A significant feature of colloquial Persian is a hybrid usage of the overt deferential second person pronoun and informal agreement forming a mismatch construction. It shows actually a different level of politeness (Nanbakhsh, 2011:1). In other words, plural pronoun with singular verb is used when the person being addressed is neither very intimate nor totally distant. A version of third person plural (*ishun*) can be used in the same way. We kept this feature and did not change it in formal equivalents.

In the next section we are going to review the features of informal Persian and find out how users change the formal Persian in the informal writing. We are describing what we have seen in the data and explaining how we found the similar cases to develop a comprehensive corpus as far as possible.

5. Differences between Formal and Informal Persian Writing

The level of informality varied among selected sentences. Some sentences only showed lexical changes. In example 1 every word of the sentence has different form in the formal equivalent.

- (1) Informal: ye hendune værdar!
 a watermelon take
 Formal: yek hendævane bærdar!
 a watermelon take
 (Take a watermelon!)

Some others underwent syntactic changes. Sentence 2 shows an example of word order change and preposition omission.

- (2) Inf: diruz bærgæsht-Ø inja.
 yesterday came back-3rd sg here
 F: diruz be inja bærgæsht-Ø.
 yesterday to here came back-3rd sg
 (S/He came back here yesterday.)

Several other sentences had both kinds of changes. Many random differences including

different kinds of abbreviations were only possible to be found by reading texts and other sources. On the other hand, there were changes that followed some morphological or phonological rules not necessarily regular led us to similar cases of the change. In order to examine each pattern, we searched it in general corpora including FarsNet (Persian wordnet) (Shamsfard, et al, 2010) and other online sources to find similar cases. Provided that the change had a reasonable frequency of occurrence, a few sentences from the sources were selected and recorded and in this way, tens or hundreds of instances of a change pattern were entered into the corpus. However, for the sake of space limits, only one example of each pattern is provided here. Next section will review the differences between formal and informal texts in four parts of phonological differences, morphological differences, syntactic differences and common mistakes.

5.1 Phonological Differences

There are many pronunciation distinctions between formal and informal Persian which have found their ways into written texts. Some are partly rule-based and follow the general rules of phonology and some others are users' creations. As mentioned earlier, language users sometimes break the rules of formal writing and devise different writing methods to be able to convey the tones and feelings. Some differences are as follows:

- a. Many patterns of phonological reduction (mostly consonants) are observed in the informal Persian:
 - (3) Inf: chan
 F: chand
 (how many)
- b. Sometimes speakers add a specified part to a formal word without adding any special meaning and make a slang-like version of the word. These phonological additions, too, had some patterns to follow:
 - (4) Inf: kharej-æk-i
 F: kharej-i
 (foreign)

- c. Phonological alternation, being often rule-based, happen frequently in switching from formal to informal Persian:

(5) Inf: **asun**
F: **asan**
(easy)

- d. Transposition of two adjoining sounds, known as adjacent metathesis, occurs in the informal Persian, mostly among poorly educated people:

(6) Inf: **qolf**
F: **qofl**
(lock)

- e. There are some silent letters which do not correspond to any sound in the word's pronunciation. On the other hand, there are some sounds with no corresponding character in the word form. Since in some cases, the word forms follow the pronunciations in informal writing, people omit the silent letter or add the absent one:

(7) Inf: **xahær**
F: **xwahær**
(sister)

“w” is silent in the formal word form. This change looks like writing the English word “enough” as “enaf”.

- f. There are some Arabic phrases imported to Persian with their Arabic writing style (along with their articles and prepositions). Persian speaker usually changes their pronunciations and subsequently their word forms in the informal usage.

(8) Inf: **ishalla**
F: **en-sha-ællah**
(God willing)

- g. In order to break vowel sequences, the speakers use different epenthetic consonants in informal speaking and subsequently in informal

writing which may not match the usual epenthetic consonants (EPE):

(9) Inf: **nobæt-e shoma-ʔ-e**
turn-EZ² you-EPE-is
F: **nobæt-e shoma æst.**
turn-EZ you is
(It is your turn.)

- h. When words ending in /e/ are connected to words or clitics beginning with a vowel, both /e/ and the vowel are usually omitted in writing:

(10) Inf: **ændaz-m³**
size my
F: **ændaze-æm**
size my
(my size)

Sometimes people omit only the second vowel (andaze-m).

- i. Some users, especially in social networks, deliberately change the letters of a word to emphasize something or ridicule or insult somebody:

(11) Inf: **selebridi⁴**
F: **selebri**
(celebrity)

5.2 Morphological Differences

A great deal of distinctions between formal and informal word forms can be studied in the field of language morphology. The morphological changes observed in this work are as follows:

- a. The language users from younger generations are frequently observed to make up new infinitives from nouns:

(12) Inf: **zæng-idæn**
call – infinitive suffix
F: **zæng zædæn**
call hit
(to telephone)

- b. Some adverbs, conjunctions and question words can be used in plural forms in the informal language:

(13) Inf: **chetori- y - a - st?**
how- EPE-pl-is

2 - Ezafe marker is placed into noun phrases, adjective phrases and some prepositional phrases linking the head and modifiers.

3 - Since short vowels do not appear in Persian writing, they are omitted in this example to show the change more clearly.

4- offensive word

F: chetor æst?
 how is
 (How is it?)

- c. In Persian, there is no number agreement between adjective and its modified noun. In standard language, the plural suffix attaches to the noun while in informal Persian the plural suffix may be added to the adjective in a noun phrase:

(14) Inf: sib qermez-**a**
 apple red-pl
 F: sib - **ha** - y - e qermez
 apple-pl-EPE-EZ red
 (red apples)

- d. In Persian script, some letters are written connected to their adjacent letter. When word forms are shortened in informal usage, they are sometimes written connected to each other and create new forms to process. For example, object marker (OBJ) *ra* changes into *ro* and *o* depending on the previous letter being a vowel or a consonant. Both *ro* and *o* may be written connected or unconnected:

(15) Inf: mæn-o næ-did- Ø
 me-OBJ not-saw-3rd sg
 F: mæn ra næ-did- Ø
 me OBJ not-saw-3rd sg
 (S/He did not see me.)

- e. The shortened forms of some words have exactly the same forms; thus the ambiguity of informal writing is much more than formal writing. The data included the following examples:

- *hæm* (also/too), *hæstæm* (am), and the first-person possessive pronoun are all shortened to “m”:

(16) Inf: maman-**m**
 mom-**m**

(mom too/ I am a mom/ my mom)

- “i” can be a noun suffix, an indefinite article or second-person singular “to be” verb:

(17) Inf: shad-**i**
 happy-**i**

(happiness/a happy [person]/ you are happy)

- The informal form of *æst* (is) and the definite article have the same appearance (e):

(18) Inf: ketab-**e**
 book-**e**
 (it is a book/ the book)

- Informal object marker and the coordinating conjunction have a same form (o):

(19) Inf: ketab-**o** bede mæn.
 book-OBJ give me
 (give me the book)

(20) Inf: ketab-**o** medad
 book-and pencil
 (book and pencil)

- Nunation or *tævin* is an Arabic character appearing at the end of some Arabic loan words. It is written on “a” character, however, similar to short vowels, *tævin* is usually omitted in writing. “a” is the shortened form of the plural suffix, as well.

(21) mæsæla =for example
 mæsæla = proverbs

A bigger number of examples were entered for ambiguous words in order for the machine to learn each meaning in different contexts.

- f. Persian has two indefinite articles: *yek* and *i*. In informal Persian people normally use both together:

(22) Inf: **ye** doxtær-**i**
 One girl-indef
 F: doxtær-**i**
 girl-indef
 (a girl)

- g. Contrary to formal Persian, informal Persian has a definite article. Demonstratives were sometimes used in formal equivalents:

(23) Inf: mærd-**e**
 man-def
 (the man)
 F: **an** mærd
 that man
 (that man)

This article may also be used with adjectives. According to the context, the modified word was added in the formal equivalent:

(24) Inf: qermez-e
red-def
(the red one)
F: **an** [chiz]-e qermez
that [sth]-EZ red
(that red [sth])

- h. Clitics are vastly used in informal Persian. To come up with the formal equivalents, informal clitics were replaced by independent syntactic elements, as far as possible, in this study. However, there were informal clitics with no formal equivalents which needed to be omitted. The following examples show the cases of this change:

- Subject clitics on some third person intransitive verbs with no impact on meaning (25) and object clitics in clitic doubling structures (26):

(25) Inf: sara ræft-**esh**.
Sarah went-sub cli
F: sara ræft-Ø.
Sarah went-3rd sg
(Sarah left.)

(26) Inf: sara ro did-æm-**esh**.
sarah OBJ saw-1 sg-obj cli
F: sara ra did-æm.
sarah OBJ saw-1 sg
(I saw Sarah.)

- Emphatic clitics:

(27) Inf: lebas-a-t-o beshur-i-y-**a**
clothes-pl-your-OBJ wash-2sg-EPE-cli
F: lebas – ha – y -æst ra beshuy.
clothes-pl-EPE-your OBJ wash
(Don't forget to wash your clothes.)

- In informal Persian some elements can be left-dislocated and left a clitic trace:

(28) Inf: sara baba-sh pir-e.
Sarah dad-poss old-is
F: baba-ye sara pir æst.
dad-EZ Sarah old is
(Sarah's dad is old.)

5.3 Syntactic Differences

These kinds of changes were possible to be found only by searching in the sources. In other words, there was no specified pattern to follow. Syntactic changes are more limited comparing to the lexical ones, but they can almost be seen in everybody's informal language. The changes observed in this study are listed below:

- a. In general, Persian has a relatively free word order, but there is a standard SOV order followed in formal language, while the informal sentences do not often follow it and the syntactic constituents can move more freely. In this project, word order was standardized in the formal part of each sentence pair (29), except for when an idiomatic meaning was intended (30):

(29) Inf: ræft-æm mædrese mæn.
went-1st sg school I
F: mæn be mædrese ræft-æm.
I to school went-1st sg
(I went to school.)

(30) Inf: boro baba! (idiom)
go dad
F: boro baba!
(Go away!)

- b. Omissions occur commonly in the informal language:

- The auxiliary in 3rd person singular present perfect verbs is omitted in informal Persian:

(31) Inf: bæche qæza ro **xorde**.
child food OBJ eaten
F: bache qæza ra **xorde æst**.
child food OBJ has eaten
(The child has eaten the food.)

- Omission of conjunctions, conditional elements and markers including *ægær* (if), *væqti* (when), *ta* (so that), and *ke* (clause marker)

is also common, as can be seen in example 29.

- Preposition stranding is disallowed in informal Persian, while a lot of preposition omission can be observed:

(32) Inf: ræft-æm mædrese.
 went-1stsg school
 F: be mædrese ræft-æm.
 to school went-1stsg
 (I went to school.)

- The coordinating conjunction *væ* (and) is sometimes omitted:

(33) Inf: qælæm kaqæz biyar.
 pen paper bring
 F: qælæm væ kaqæz biyavær.
 pen and paper bring
 (Bring pen and paper.)

Simple past and present perfect have the same word form in informal written Persian (except for the 3th person singular).

(34) Inf: xord-i
 ate-2ndsg

F: xord-i / xorde-ʔi
 ate-2ndsg/ eaten-2ndsg
 (ate/ have eaten)

5.4 Common Mistakes

Common linguistic mistakes of the users can again be syntactic, phonological or morphological. Mistakes were more observed in online comments and short messages. Similar to the two other changes, common mistakes could be traced by searching or following the patterns. Some of them are as follows:

- a. Incorrect use of informal written form of copula *æst*, Ezafe marker and informal definite article, all sounds like /e/, known as *Hekæsre* error.

(35) Inf: maman-h mæn
 mom-def my
 [using article instead of Ezafe marker]
 F: maman-e mæn
 mom-Ez my
 (my mom)

- b. Making plurals out of plural nouns

(36) Inf: aqa - y - **un -a**
 gentleman-EPE-pl-pl
 F: aqa - y - **an**
 gentleman-EPE-pl
 (gentlemen)

- c. Adding Arabic *tænvin* (nunation) to Persian words:

(37) Inf: telefon-**an**
 phone-tanvin
 F: telefon-**i**
 phone-noun suffix
 (by phone)

- d. Using a word mistakenly instead of another word with a similar pronunciation:

(38) Inf: tæsfiyehesab
 F: tæsviyehesab
 (settlement)

These kinds of mistakes which are much more common in informal writings, were tried to be covered in the database.

6. Results and Evaluation

The result of this research is available as a corpus of more than 50,000 pairs of formal-informal sentences along with a dictionary consisting formal-informal pairs of words and phrases. About half (49.77%) of the informal sentences needed syntactic changes besides lexical changes to be converted to formal ones, while the other half, could be converted just by changing the informal words. A detailed statistic is presented in table 2.

50,014	the number of input sentences
12.32	the average length of formal sentences
11.36	the average length of informal sentences
529,286	the number of word/phrase alignments
71,842	the number of unique word pairs (alignments)
49.77%	the percentage of data with syntactic change
49,397	the dictionary size

Table 2. Statistics of the developed corpus

Raw data (informal sentences) is gathered from various sources. Table 3 shows the distribution of sentence sources in the final corpus. The row ‘myself’ means that the sentence is not extracted from a source and is rather generated by the linguists.

source	# of sentences
web	26,014
Twitter	5,308
Instagram	4,747
myself	3,528
movie (including movies, dramas and movie subtitles)	3,282
messenger	2,751
weblog	2,400
book	1,984
total	50,014

Table 3. Distribution of different sources in the final data

For extrinsic evaluation of the corpus, we used it in a deep model of an informal to formal converter and compared the results with a rule-based method. Experiments show that using a deep Bert2Bert architecture trained on our corpus (named Fa-BERT2BERT (Falakflaki and Shamsfard, 2024) leads to bleu score of 70.68% and Rouge-L of %86.15 on the testset of ParsMap, while the rule-based method (which does not use this corpus to train) gains 34.36% bleu score and 54.21% Rouge-L on the same test set. A comprehensive study on various style transfer methods evaluated by various metrics using this corpus can be found in Falakflaki and Shamsfard (2024).

7. Conclusion and further work

This study was conducted to develop an informal-formal language corpus for Persian language for the purpose of natural language processing. In order to achieve this aim, many available sources of informal writing were explored to recognize its particular features and build a well-organized and operative dataset.

The minimum possible changes such as transpositions, additions and omissions were applied to make the formal equivalents in order not to change the original meaning, however, there are evidently shortcomings such as omitting some informal segments of emphasis and feelings in formal equivalents which led to omit a part of meaning that was inevitable according to our instructions. This issue can be addressed in future studies.

Moreover, although we tried to cover the differences between informal and formal Persian writing as far as possible, there are certainly cases we have missed.

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