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Verb: A Cognitive Facilitator
A Case of Marathi Colloquial Conversations

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Abstract

Language comprehension has been a fascinating area of research for grammarians, linguists, philosophers and computer scientists alike. In Marathi grammatical tradition, a sentence is viewed from the verb-centric position in several treatises. Moreover, the complete discussion is put in a theoretical framework. The current report, the extension of earlier research on the Marathi language, adopts an experimental outlook to examine the communicative aspect of the sentence in colloquial (non-standard variety) Marathi written conversations. Based on the subjective reports of 95 native and non-native readers obtained from four experiments it is argued that a single-verb in a conversation is comprehensible hence can be regarded as a complete sentence itself. The contrastive analysis suggests that complete sentences are easier to process than single-verb sentences, which in turn, are more accurately comprehended than nominal sentences. Resorting on textual and sociolinguistic variables, the report also probes into the underlying nuances of language comprehension.

Keywords: Marathi, nominal sentence, sentence comprehension, experimental research, single-verb sentences

"*In verbal communication, the usage has a more powerful status than that of rules of grammar...*"
Arjunwadkar (1987)[1]

1. Background of the study: [2]

1.1. What is this research about?

[1] Arjunwadkar quotes Dadoba Tarkhadkar, a renowned Marathi grammarian and states that when it comes to the verbal behaviour of the people, the language which is actually used in speech is more effective than the rules of grammar, because it serves the purpose of communication. The original Marathi sentence is: "*lokāta vyākaraṇācyā niyamāṇpekṣā prayogācīca sattā balavattara asatye…*" Arjunwadkar (1987, p. 50).
This statement is cited for setting a background for the argument of the manuscript, *viz.*, studying the comprehension of the colloquial conversations. In colloquial or non-formal language, many words do not necessarily follow the standard rules of grammar but denote the desired meaning.

[2] The transliteration system for original non-English sentences used in the manuscript follows the IAST system (International Alphabet of Sanskrit Transliteration). Abbreviations used in the manuscript are as follows: CS- Complete Sentence, Exp- Experiment, M_D- Mean-Difference (between two variables), NS- Nominal Sentence, p-value- Probability value, Para- Paragraph, Pop.- Population, RQ- Research Question, SV- Single Verb (Sentence), VP- '*Vākyapadīya'* by Bhartṛhari, and vs.- Versus.

This research on the study of the comprehension of Marathi colloquial conversational data is an extension of our earlier research on Marathi literary or formal (non-colloquial) data[3] which in turn is an extension of the critical investigation of Sanskrit conversations[4] and of a massive experiment on English news items.[5] Thereby, the current research can be considered as one of the many pieces in a long string of studies encompassing the cognitive and sociolinguistic aspects of human sentence-comprehension and also as a starting point for the following future researches[6] in the same field.

Human-like language comprehension has been a captivating area of research for grammarians, linguists, logicians, philosophers, computer scientists and neurocognitive scientists. An enormous amount of literature can be found on the concepts such as a word, sentence, their interrelations with word-meanings and sentence-meanings, the types of sentence meanings, the auxiliary means that aid the sentence processing and speakers' intention, several ways used by the listener to disambiguate the complex words in the context, etc. in ancient Indian literature. The grammatical literature in Marathi also studies the concept of word and sentence in great detail, from both syntactic and semantic aspects. It is observed that the theoretical discussion has been the common underpinning of this discourse.

With the advancements in the mechanical and statistical fields, the scientific and methodical study of exploring the process of human sentence comprehension has become possible. The development of the psycholinguistic field has enabled us to carry out a more sophisticated and explorative study of the same issues by conducting experiments to study the nuances in the comprehension process.

1.2.The Emergence of the Idea of the Research

Bhartṛhari, the grammarian-philosopher (*circa* fifth century CE) has enumerated a total of eight definitions of a sentence in the second chapter of his phenomenal work '*Vākyapadīya*' in Sanskrit versified form.[7] The very first definition of a sentence '*ākyātaśabdaḥ*' (i.e., the word which is a verb) gives the status of a sentence to the single-verb in the conversations. The definition emphasizes the fact that when a user utters a single-verb, it can be considered as a sentence if it denotes the complete meaning.[8] Thereby, the definition establishes the important

[3] (Gajjam & Kulkarni, 2020a), (Gajjam & Kulkarni, 2020c)
[4] (Gajjam, Kanojia, & Kulkarni, 2018), (Gajjam & Kulkarni, 2020b), (Gajjam & Kulkarni, 2020c), and (Gajjam & Kulkarni, 2020d)
[5] (Wani, Mathias, Gajjam, & Bhattacharyya, 2018)
[6] Based on the results obtained from this research, the author has investigated the cognition of the kārakas and the respective verbs and suggested five criteria readers consider before assuming a kāraka of a single-verb (Gajjam, 2021).
[7] Bhartrihari has enumerated the following definitions of a sentence: (1) the verb, (2) the combination of the words, (3) the universal which lies in the combination of the words, (4) the single, part-less unit of language, (5) the sequence, (6) the meaning principle in the mind of the speaker, (7) the first word, and (8) all the words in the sentence having mutual expectancy of one another. (VP.II.1-2) (Sarma, 1980, p. 1).
[8] The commentator Pt. Raghunatha Sarma explains that, when a mere verb denotes the complete meaning without its *kāraka*s (arguments), it can be regarded as a sentence (Sarma, 1980, p. 2).

role of the verb in the sentence from a syntactical and semantic perspective.[9] In the last three years, the communicative aspect of this definition has been explored to study the status of the single-verbs in human sentence processing mechanism.

In a novel eye-tracking experiment on Sanskrit, it is found that the verb is an important element in the sentence semantics without which a sentence seems to be incomplete (Gajjam, Kanojia, & Kulkarni, 2018, p. 243)[10] which is valid for both prose and poetry texts (Gajjam & Kulkarni, 2019a, p. 142). For verb-less (nominal) sentences, it is argued that readers take a copular verb with which the other words in the nominal sentence are construed to have a complete, precise understanding (Gajjam & Kulkarni, 2020d, p. 145). It accented the fact that the words in the sentence revolve around the main verb. These studies have been conducted on the second-language speakers of Sanskrit. The first-of-its-kind of research on the Marathi native speakers suggest that the nominal sentences in Marathi are comprehended with similar efforts as single-verb and complete sentences (Gajjam & Kulkarni, 2020a, pp. 18-19). However, the data set in this experiment belong to the literary or formal variety of Marathi conversational data. The unanswered question of whether similar results can be obtained for the colloquial conversations has been addressed in the current report.

1.3. Marathi Grammarians on Sentence

A lot of theoretical discussion on the sentence and the necessity of the verb has been carried out by several Marathi scholars in various books on Marathi grammar (Tarkhadkar, 1857; Damle, 1970; Arjunwadkar, 1987; Govilkar, 2001; Dhongde & Wali, 2009; Pandharipande, 1997). It is stated by Damle (1970, p. 662) that the discussion on the sentence is the prominent area in the grammar. It is accepted by all grammarians that the verb makes a linguistic string a sentence. Hence, the verb is said to be the soul of the sentence. Govilkar (2001, p. 293) goes one step further and states that generally speaking, it wouldn't be wrong in considering as many sentences as many verbs are present in it. Later on, the author suggests another definition as a sentence is a combination of words that gives the comprehender a complete idea of the message. Thus, the author considers both syntactic and semantic approaches while defining a sentence.

Basically, a sentence can be considered as a concatenation of words having a qualifier-qualificand relation among them. Whenever we hear a sentence, we understand the action which is denoted by the verb[11] as the chief qualificand, with other words in the sentence

[9] Apparently, the definition '*ākhyātaśabdaḥ*' given by Bhartrihari appears to be focused on the syntax of the sentence. The commentators Punyaraja and Pt. Raghunatha Sarma (1980, p. 2) point out the semantic aspect of it. Sarma gives an example of the verb '*pidhehi*' ('[Please] close [the door]') mentioning that when a listener listens to this word, s/he understands its object 'door' that is to be construed with the verb. Hence, the single-verb '*pidhehi*' denotes the complete desired meaning in this case.

[10] The authors have also provided some guidelines to translate Bhartṛhari's definitions into experimental research (Gajjam & Kulkarni, 2019b, pp. 10-12).

[11] The definition of a verb as given by Tarkhadkar (1857, p. 23&148) is the word that denotes an action or a state.

qualifying that meaning. Hence, the verb plays an important role while designating a sentence. Hence, if one must have a one-word sentence, it has to be the verb. Verb along with the noun is considered basic parts of speech without which a sentence, grammatically and syntactically, seems incomplete.[12] Damle argues that it is necessary to have an object (i.e., destination or goal- '*karma*') as well if the verb is transitive in nature (Damle, 1970, p. 663). There are mixed opinions about the necessity of the agent and object in a sentence, but the necessity of the verb is being unanimously agreed upon.

Consequently, a verb-less sentence or nominal sentence is considered to be incomplete. All of these scholars view the sentence mainly from the syntactical approach and explain the verb playing the role of the '*vākyāpūraka*' (something that completes the sentence).[13] The semantic nature of the single-verb sentences is slightly being touched upon and of the nominal sentences has remained a twilight area.

1.4. Psycholinguistics and Sentence-Comprehension

The study that how human comprehends a language has started before the end of the nineteenth century which was then known as *Psychology of Language* in the field of linguistics. Various aspects of language such as language production, language comprehension, language acquisition, text reading, and so forth have been explored within a theoretical framework. It was only in the 1980s, with the emergence of various modern and sophisticated machines such as EEG, fMRI, PET, ERP, eye-tracking and so forth, when the behavioural experimental research has begun in psycholinguistics that has engendered a plethora of research. They study the real-time comprehension among the readers with intrusion or semi-intrusion methods.[14] A few other, comparatively old but well-established methods such as pen-paper method is used by us. It is usually conducted in a controlled environment (more often in a classroom) with the investigator supervising the participants and also in a less supervised manner (e.g., web-based) using an internet facility. These are non-intrusive methods and are often used to study a previously proposed theory.[15]

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[12] Tarkhadkar (1857, p. 300) argues that a sentence must have at least two words: an agent ('*kartā*') and a verb form ('*kriyāpada*'). He makes it clear by mentioning that it shouldn't be misunderstood that only these two types of words make a linguistic string a sentence, but it is a minimum requirement.

[13] Damle (1970, p. 163) suggests that the third adjective '*vākyapūraka*' (that which completes the sentence) should be added to the definition of the verb with the other two adjectives, that is, '*kriyābodhaka*' (that which denotes the action) and '*kālabodhaka*' (that which denotes the time).
A similar view is presented by Govilkar (2001, p. 145) that semantically speaking, the verb is an important element to make a linguistic string a sentence. The author quotes Jesperson while proposing this view, 'the verb is a life-giving element, which makes it particularly valuable in building up a sentence, a sentence nearly always contains a verb'.

[14] These methods are known as true-online methods such as EEG- electroencephalography, fMRI- Functional Magnetic Resonance Imaging, PET- Positron Emission Tomography, and ERP- Event-Related brain Potentials, etc. that are highly automatized and measure the unconscious mental and neural processes. More details are presented in Gajjam et.al (2018).

[15] Gajjam have given a detailed account of the several experiments conducted on different languages, with different the orthographic system, writing principles, morphological systems, etc.

In the current paper, we present the details of pen-paper experimentation, both web-based and classroom-controlled. This research comes under the purview of psycholinguistics because readers' behaviour with respect to the processing of different types of sentences is the topic of exploration.

1.5. Sociolinguistics and Sentence Comprehension: A Brief Introduction

The study of sociolinguistics, viz., the study of the effect of social aspects such as age, gender, education, ethnicity, religion, occupation, social status, etc. on language use has started in the first half of the nineteenth century. Gender-wise study of language use has started with the famous essay written by Robin Lackoff[16] that mentions ten features that are exclusively found in women's speech and theories related to it (Karlsson, 2007).

This field of research was chiefly dedicated to the use of language, although, modern scholars have started studying the effect of sociolinguistic variables on language comprehension as well. The results have shown that women are better readers (Wei, 2009), better speakers (Karlsson, 2007), and better comprehenders than men (Kansaku, Yamaura, & Kitazawa, 2000; Keshavarz & Ashtarian, 2008). However, Nemati et.al (2007) showed no significant difference between males and females. The age and the linguistic exposure of the participants almost always work hand in hand, at least when the native language is considered. More the age, more linguistic exposure! Linguistic exposure in terms of daily usage has also been considered as one of the variables. Non-native speakers of Marathi, who acquired the Marathi language after the age of six years as a medium of instruction in their respective schools are also included. This variable is leveraged while analyzing the data to perform a comparative analysis of comprehension among native and non-native speakers.

1.6. A Brief Note on the Marathi Language: With Reference to Experiments

Marathi (pronounced as *Marāṭhī*) belongs to the south-west branch of New Indo-Aryan languages. Indo-Aryan is a sub-branch of the Indo-Iranian branch of the Indo-European language family.[17] It is spoken in the Maharashtra state of India. With around 100 million speakers, it is one of the of the major languages of India. It is written using the Devanagari (*Devanāgarī*) script. The reason behind using Marathi for the experiment is to test the sentence-processing among native speakers as stated already.[18]

[16] Lackoff's book '*Language and Women's Place*' has given rise to the systematic study of gender roles in language usage.
[17] [Quote:] "Marathi is a modern cultivated language with standardization, conscious vocabulary enrichment, widespread school & college education, print and audiovisual mass-media, urban theatre, sociopolitical movements… and public administration." (Taken from the introduction of the book (Kelkar, 1997))
[18] It can be argued that when Bhartrihari enumerated the sentence-definitions, Sanskrit *might* have been *lingua franca* and the definitions might have taken shape based on the language that was spoken. (However, we do not intend to claim that Sanskrit *was* spoken by the majority of the population even at that time.) Hence, while studying this definition, we were motivated to take the native language of the readers as the stimuli, which has remained unexplored in earlier Sanskrit experiments by modern researchers owing to the restriction posed by the lack of native speakers of Sanskrit.

The instances of single-verb sentences are abundantly found in the daily conversations of Marathi speakers. Similarly, many examples of nominal sentences are also seen in the informal conversations, newspaper headlines, exclamations, affirmative questions, titles of the books, proverbs, and idioms, etc.[19] Cognitively speaking, these sentences are definitely comprehensible. The very fact that the speaker uses these types of sentences and the listener replies to the speakers' message verifies this fact. Consider the following conversation from the Marathi novel 'Shala'[20] ('School') by writer Milind Bokil:

> "What are you up to?" I asked Chitre…
> "Experiment."
> "What about?"
> "Arre, I'm trying to create a torch that works both ways."
> "Both ways?"
> "Yes. It'll light up on this side when I push the button that way and then on that side when I push it this way," explained Chitre.
> It was beyond me…

Here, a competent reader understands the meaning of each sentence without much effort. This is taken as an example of nominal sentences to demonstrate the successful comprehension.

1.7. How Is This Study Different From Earlier Studies?

This study is one among a series of many studies on the cognitive investigation of sentence definitions. The earlier studies on Marathi are conducted on the literary language. The primary difference between literary and colloquial language is that colloquial language is not used in the literature of the language. The distinctive vocabulary makes it difficult to read and understand as annotated by some of our participants. It leads to difficulty in understanding the sentence. A few types of such distinct words found in colloquial language data used in our experiments are as follows:

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[19] A few examples of nominal sentences in Marathi are as follows: In (1) newspaper headlines ('*chīnacā pardāphāśa*'- China Busted), (2) in exclamations ('*śābbāsa!*'- used to express appreciation, '*che!*'- used to express disapproval), (3) in affirmative questions ('*ho ki nahi*'- Isn't it?), (4) as titles of the books ('*tī phularāṇī*', '*kuṇā ekācī bhramaṇagāthā*' etc.), (5) proverbs, and idioms ('*ati tethe mātī*'- too much of anything is bad), etc. In each example presented here, a verb is missing, making it a nominal sentence.
[These examples are taken from the links https://www.sumanasa.com/marathinews/, http://kaushiklele-learnmarathi.blogspot.com/2013/02/exclamations-in-marathi.html, https://www.goodreads.com/shelf/show/marathi, and https://marathi.popxo.com/2019/04/125-famous-marathi-proverbs-in-marathi/. All links are accessed on 13 July 2020, 10:00IST]
Similarly, single-verb sentences are used as a reply or as a question in conversations such as '*karate*' ([I will] do), '*yenār*?' ([Will you] come?) etc. These two examples are taken from the experiment mentioned in this manuscript.

[20] The story was later adapted and made into a national award-winning motion picture with the same name in 2012 directed by Mr. Sujay Dahake. The English translation taken here is by Vikrant Pande's 'Shala', Harper Perennial Publication, 2014 Edition, ISBN-10: 9353026679.

Table 1: Distinctive vocabulary in Marathi colloquial texts

	Colloquial word	Formal Marathi equivalent word	Meaning
Little modification:	*sālet*	*śālet*	In school
	karatī	*karate*	[I will] do
	pan	*paṇ*	But
	sārakī	*sārakhī*	Always
	ragāt	*rakta*	Blood
Omission of a few letters:	*cā*	*cahā*	Tea
Addition of a few letters:	*doska-biska*	*doka-bika*	Head etc.
Borrowed words with change:	*ṭāyam*	-	Time
	miśīn	-	Machine
	hāpīs	-	Office
	mol	-	Mall

The current report addressed the effect of distinctive features of colloquial language on the processing of sentences. In what follows, we resume the details of the experimental research in the next sections. In Section 2, we present the hypothesis and research questions, followed by experimentation details in Section 3. Section 4 deals with the results, and analysis of the data in a detailed manner. We present some observations and discussion on the result obtained in Section 5. A few limitations regarding this research along with the future scope are given in Section 6. The paper is concluded in Section 7.

2. Problem Statement and Research Questions

We set our hypothesis as, "The majority of Marathi readers successfully comprehend single-verb sentences and nominal sentences in a conversational data of Marathi colloquial language."

Research Questions (RQ, henceforth):

(i) Are the nominal sentences in Marathi comprehensible?

(ii) If yes, do the nominal sentences pose a more cognitive load on the readers due to the lack of the verb?

The next topic we explore is single-verb sentence comprehension. Hence, the next RQs to be addressed are:

(iii) Are the single-verb sentences comprehensible for the majority of the readers?

(iv) Which among the three types of sentences: nominal sentences, single-verb sentences, and complete sentences- are easier to process or are processed more accurately?

To add a few more facets to the study, we carry out a sociolinguistic study to have a better perspective of the research:

(v) Does the context of the conversation facilitate the process of comprehension?
(vi) How much do the reader-specific variables such as age, native language, and language exposure affect the comprehension accuracy?
(vii) How do some textual features such as difficulty level[21] and familiarity of the conversation affect comprehension?
(viii) Which among all these variables has the most effect on comprehension?
(ix) Finally, what is the effect of the Observer-Participant bias?

Rather than answering these questions one by one, we address them topic-wise in Section 4. The next section gives the details of the experiment that will set the background for the next section on data analysis.

3. Experimentation Details

Table 2: Experiment details

Experimentation Details	
Language	Marathi
Type of literature	- Conversations - Colloquial language - Two paragraphs each experiment
Type of dataset	- Continuous Text - Discontinuous Text
Mode of conduct	- Web-based - Classroom-controlled
Participants	- Total 95 readers - Both male and female - Different age groups - Native and non-native speakers
Methodology	- Semi-supervised - Unsupervised
Measures to evaluate the data	- Accuracy of the answers - Demographical data of the readers - Statistical significance tests

Dataset Description

A total of four paragraphs from modern Marathi literature published online[22] were manually chosen, selected and then finalised by a team of two expert linguists, one among them being a native speaker of Marathi. These four paragraphs are divided into two data sets for the

[21] It is suggested that the textual features such as difficulty and familiarity of the text have either a facilitating or inhibiting effect on reading comprehension (Wei, 2009).
[22] Marathi paragraphs are chosen from several blogs published on the website www.misalpav.com. (The link was accessed in July 2019.)

experimentation purpose. In the first data set, a single story is divided into two different paragraphs. The second data set contains two different stories in two different paragraphs. The first data set is used in Exp1 (continuous text) and the second data set is used in Exp2 (discontinuous text). The purpose of two different types of data sets is to test whether the textual features such as continuity in the paragraphs affects the accuracy of the comprehension of the sentence. All paragraphs are taken from the modern Marathi literature depicting the colloquial Marathi used by people in the daily conversations, more prominently by the people from villages or lower societal strata. Each paragraph was presented in Devanagari script and did not exceed 25 sentences[23] and consisted of at least one instance of the three types of sentences viz. single-verb sentence, nominal sentence and the complete sentence (Figure 1)[24] as follows:

(S1) '*maśin kāy dombal kāmācī*!' (What a useless machine this [is]!)- A nominal sentence.
(S2) '*yetīs*?' (Will [you] come?)- A single-verb sentence
(S3) '*ābānnīc āṇalyāt salaLī pustaka*' (*Aba* [father] has brought all these books.)- A complete sentence.

Paragraphs are followed by three questions related to these three sentences the correct answers to which ensures the successful comprehension of respective sentences. Readers are also asked to annotate the difficulty level and the familiarity of the paragraph.

[23] The sample size is small to avoid boredom, fatigue and to ensure readers' interest and attention throughout the task.

[24] The sentences in a box in Figure 1: Sample paragraph from Marathi web-based experiment are taken as examples of different types of sentences: Sentence 1: '*karatī*' ('[I will] do') as a single-verb sentence, Sentences 2: '*kisanacā cā kapāt vatalā*' ('[She] poured the tea in a cup for Kisan'), and Sentences 3 and 4: '*koṇ inspecṭar*' ('Who/ which inspector [do you mean]?') and '*raktācī tahān*' ('a thirst for blood [is the name of this novel I am reading]') Here, we present the loose English translation of the sentences and also provided omitted word in brackets to present the complete context.

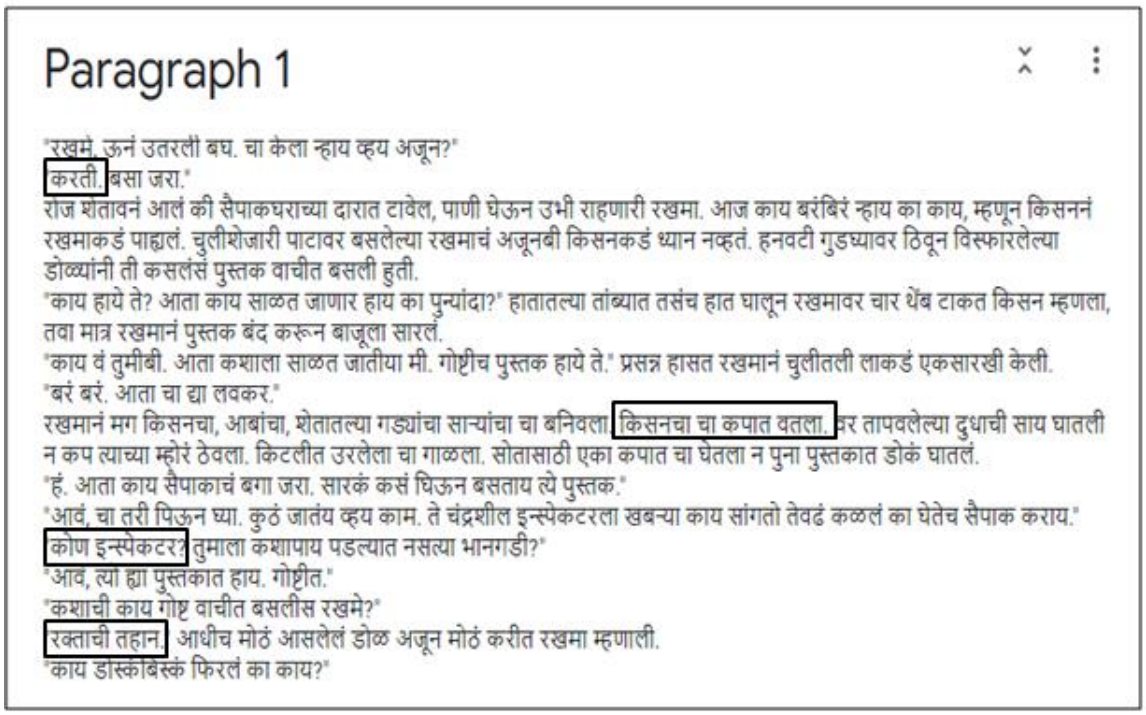

Figure 1: Sample paragraph from Marathi web-based experiment

Participant Description

A total of 67 readers, both male and female readers from all over India, participated in a web-based experiment. All of them were neurologically healthy adult readers. A few of them were native speakers of Marathi while the remaining readers had Telugu, Kannada, and Hindi as their mother tongues. Almost all readers have daily exposure to the spoken and written Marathi. In a classroom-controlled experiment, a set of 28 readers, female readers, participated in both experiments. All of them were teenagers belonging to the age group of 15 to 22 years. They are neurologically healthy, college-going students in Maharashtra. Almost all of them are native speakers of Marathi and acquired the language at an early age. Thus, a total of 95 participants[25] participated in the task.

Each participant was asked to give his/her consent before participating in the experiment.[26] They were informed about the experimentation details, annotation input method, and the need for attentive reading before the experiment begins. Two sample paragraphs were given as a pre-test to have them acquainted with the experimentation process. The experiments

[25] In a psycholinguistic experiment, the sample size of 30 participants is conventionally considered valid for analysing the data statistically. Too few or too many participants are said to disrupt the results leading to non-conclusive findings. We have a set of 35-32 (67 in a web-based experiment), and 28-28 (in a classroom-controlled experiment) participants in each experiment which makes it valid for consideration of a statistical significance test.

[26] In a consent form, we have mentioned the details about the purpose of the experiment and its use for purely academic purposes, assurance of no breaching of their personal data, etc. We also ensured them of no potential loss, either on medical grounds or other health or mental hazards, in participating in the experiment. Rather, participants have given positive feedback that the experiment/s will help them in their state-level final examinations.

were conducted during their regular timings of instructions at the college so that they were not needed to invest extra personal time which makes it more authentic in terms of capturing their attention during the task. Each participant has participated voluntarily and was acknowledged and rewarded for the time and effort after the experiment.

Methodology

The web-based experiment was conducted by creating a Google form mentioning the information about the experiment (Figure 2), followed by the consent form. The participants were allowed to proceed only when they consent to participate in the experiment (Figure 3). The task consists of two paragraphs, which are presented one after another so that participants cannot view the second paragraph while they are viewing the first paragraph however they can come back to the first one once they reach the second paragraph if they wish so. Each paragraph is followed by the questions and multiple-choice options as answers. The task concludes with the feedback form and the acknowledgement receipt.

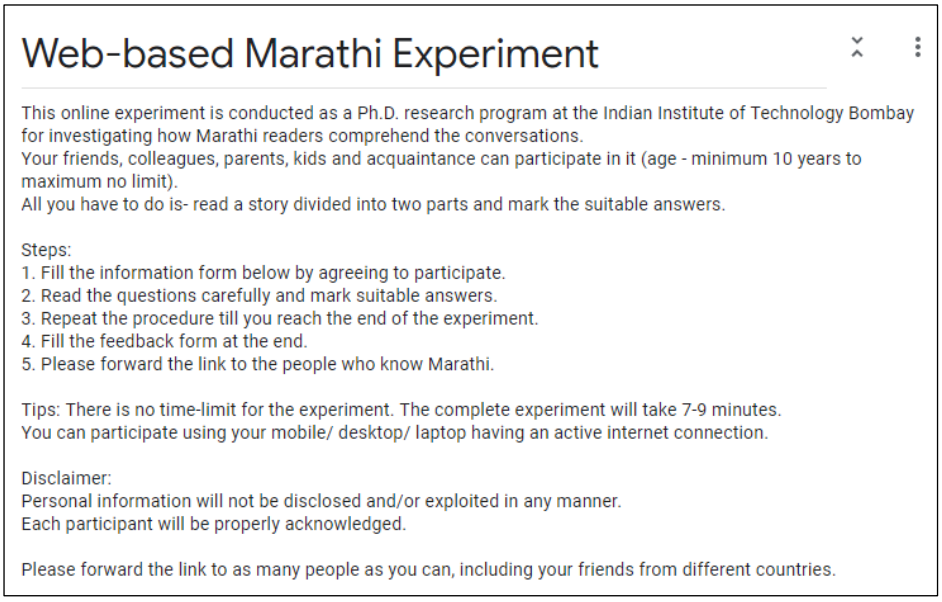

Figure 2: Web-based Marathi Experiment: Screenshot

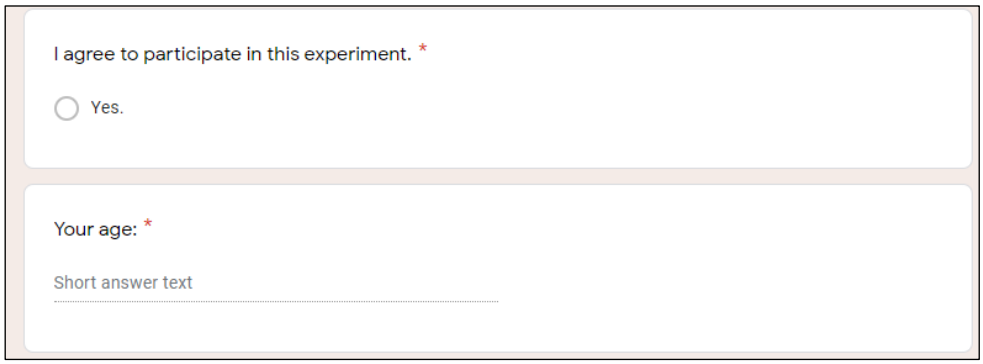

Figure 3: Consent asked to the readers before participating in the experiment

Participants across India have participated in the web-based experiment. Since there is no intrusion of the investigator during the experimentation, this method is considered an 'unsupervised experiment' in which readers' reading behaviour was not recorded. On the contrary, the classroom-controlled experiment was a semi-supervised experiment as the investigator can observe the participants performing the task- their speed of reading, their navigation through the paragraphs, etc. Several Marathi speakers from Maharashtra have participated in the classroom-controlled experiment. Since both experiments followed the self-paced reading method, no time limit was set. The average time taken to finish the task in a web-based experiment was around seven minutes as against the classroom-controlled experiment in which readers have taken almost 15 minutes on average to finish the task.

4. Results and Analysis

Originally, a total of 36 readers have participated in two web-based experiments (Exp1 and Exp2). Among them, one reader in Exp1 and four readers in Exp2 have scored less than 50% accuracy and hence were removed from the process of data analysis. Similarly, among 32 readers who have participated in a classroom-controlled experiment, we eliminated four readers.[27] Hence, we have data of a total of 35 readers (Exp1- web-based), 32 readers (Exp2- web-based) and 28 readers (Exp1 and Exp2- classroom-controlled) to be considered henceforth.

Table 3: Participant Description

Participant Description		
	Online Exp.	**Classroom-controlled Exp.**
Sample Size	Total 67	Total 56
Distribution of sample	35 (Exp 1) + 32 (Exp 2)	28 (Exp 1) + 28 (Exp 2)
Age-group	Adults	Teenagers
Gender	Both male and female	Almost all female
First Language	Both native and non-native	Almost all native

[27] We have removed P23 in Exp1 and P8, P9, P10, and P25 in Exp2 of an online experiment since they have marked 50% or less accuracy. Similarly, four readers- P13, P18, P19, and P30 have been eliminated from the classroom-controlled experiment for the same reason.

4.1. Overall Comprehension of Marathi Colloquial Conversations

A total of 67 readers among a total of 72 readers that have participated in a web-based experiment and 28 readers among 32 readers who participated in a classroom-controlled experiment have scored more than 50% accuracy in comprehending colloquial Marathi texts. In a low-load task, usually, 67% of accuracy is taken as a standard measure, however, we resort to 50% accuracy since the colloquial language is annotated as 'difficult to read and comprehend' making it a comparatively high-load task.

It is observed that almost 93% and 87% of the total population have successfully comprehended the paragraphs in a web-based and a classroom-controlled experiment respectively (Table 5). For the remaining population, we could not find any possible reason for their unsuccessful attempt at comprehension that can be confirmed. No consistent variable is found behind their failure in comprehending the texts. Four teenagers, Marathi native speakers, and female participants in a classroom-controlled experiment that have daily exposure to Marathi have scored the least accuracy. Similarly, among five readers in a web-based experiment that have scored the least accuracy, three female readers are Telugu native speakers and have rare exposure to Marathi. The remaining two male readers are Marathi native speakers that belong to age 31 and 25 years and have daily exposure to Marathi. It appears that these readers have performed careless inattentive reading which led to the incorrect marking of the answers. They are removed from the data analysis procedure.

Table 4: Analysis1: Population-wise Comprehension

Population-wise Comprehension		
	Web-based Exp.	***Classroom-controlled Exp.***
Out of total Pop.	93%	87%

To summarize, our hypothesis is proven that the majority of Marathi readers comprehend colloquial conversations successfully.

4.2. Comprehension of all SV, NS, and CS in all experiments:

First, we address the research questions RQ (i) and RQ (iii) presented earlier. We take all three types of sentences comprehended by all readers in both types of experiments separately. We found that 92% of the complete sentences are comprehended successfully. It is followed by single-verb sentences and then by nominal sentences. 90% of total single-verb sentences and 82% of nominal sentences were understood by the readers. It is found that all three types of sentences are definitely successful which proves the hypothesis however they differ in the degree of comprehension.

Now we study the difference in the degree of comprehension by taking all sentences together (Table 5) to address RQ (ii). We found that complete sentences are easier to process than nominal sentences (*p*-value is significant 0.00). The logical explanation behind this can be stated as the reader does not have to assume any omitted verb in the case of complete sentences, it is easier for him/her to process the complete sentence in a more effortless manner than the nominal sentences where the omitted verb has to be provided by the reader with reference to the context to have a complete cognitive experience of the sentence.

Table 5: T-test Results for all three types of sentences

T-test Analysis for all three types of sentences		
	M_D	***p-value***
NS vs. CS	-0.11	**0.00**
NS vs. SV	-0.09	**0.002**
SV vs. CS	-0.02	0.22

However, such difference is not found with respect to the single-verb sentence viz. both SV and CS are processed in a similar manner (insignificant difference of 0.22). Here, even though a reader has to provide the omitted words in the case of SV, it appears that s/he has managed to extract most of the meaning based on the single- verb that is attested on the surface level of the language. This establishes the fact that the verb is the most important element in sentence semantics.

When we compare the data of SV and NS, we found that it is the SV that is processed more accurately than NS (Mean-difference is -0.09) with a significant difference among both types of sentences (i.e., 0.002). The sentence without a verb requires more mental effort on the reader's part due to which it is difficult for them to process nominal sentences as easily as SV and CS. Thus, we have addressed two research questions here viz. whether the NS pose more mental fatigue as compared to other sentences [RQ (ii)] and also which among the three types of sentences are easier to process [RQ (iv)]. It is found that the CS is comprehended more accurately, followed by SV sentence, and then by NS. Despite the difference, the successful comprehension by the majority of Marathi speakers is unanimous in all three types of sentences.

4.3. Comprehension in a Web-based vs. Classroom-controlled Experiments

As seen in analysis 4.1, almost 93% and 87% of the total population have successfully comprehended the paragraphs in a web-based and a classroom-controlled experiment respectively. It seems that more readers in a web-based experiment comprehended texts accurately than those in a classroom-controlled experiment. The difference between these two types of experiments is significant (Table 6) that is, 0.00.

Table 6: T-test Results for two types of experiments

T-test Analysis for two types of experiments		
	M_D	***p-value***
Web-based vs. Classroom Exp.	0.42	**0.00**

If we check percentage-wise accuracy (Table 7), it is found that more questions from the web-based experiment are answered with 100% accuracy as compared to classroom-controlled experiments. In the classroom-controlled experiment, most of the questions obtained 33-67% accuracy than in a web-based experiment. A number of questions that have a minimum accuracy, that is, 33% are more in a classroom-controlled environment (Figure 4).

Table 7: Percentage-wise accuracy and number of total correct answers in two types of experiments

Percentage-wise accuracy and number of correct answers in two types of experiments		
	Web-based	**Classroom-controlled**
100%	115	80
67%	24	27
33%	4	17
0%	1	4

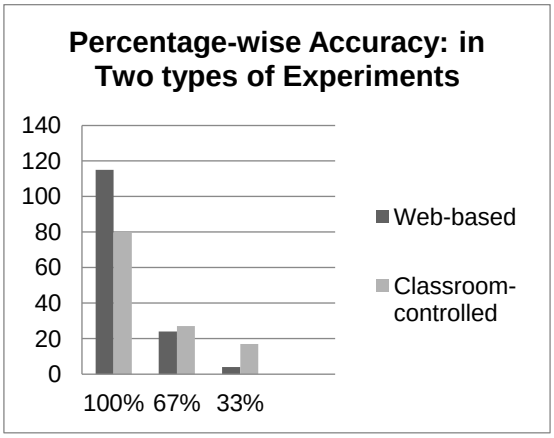

Figure 4: Percentage wise accuracy and number of correct answers in two types of experiments

If we compare the comprehension of NS, SV, and CS in two types of experiments, we find that NS in web-based experiments required more processing as compared to SV and CS since the difference in their comprehension is significant as shown in

Table 8. No such difference can be seen in a classroom-controlled experiment viz. all sentences are processed in a similar manner.

Table 8: T-test Analysis for all types of sentences in two types of experiments

T-test Analysis for all types of sentences in two types of experiments				
	Web-based		***Classroom- controlled***	
	M_D	***p-value***	M_D	***p-value***

NS vs. CS	-0.13	**0**	-0.08	0.06
NS vs. SV	-0.14	**0**	-0.03	0.27
SV vs. CS	0.01	0.16	-0.05	0.16

To account for the difference between the two types of experiments in terms of processing three types of sentences, we compare NS, SV, and CS in both experiments (

Table 9). A significant difference is seen for all three types of sentences, that is, these sentences are processed more easily in a web-based experiment than in a classroom-controlled experiment.

Table 9: T-test Analysis for a comparison of NS, SV and CS

T-test Analysis for a comparison of NS, SV and CS		
Web-based vs. Classroom-controlled Exp.		
	M_D	***p-value***
NS	0.08	**0.04**
SV	0.2	**0**
CS	0.14	**0**

Additionally, to account for this difference in two types of experiments, viz. to address one of our research questions [RQ (ix)] we consider a few independent variables that might have affected the data. One possible reason behind this type of difference might lie in the age group difference among the readers who participated in both experiments. Readers in a web-based experiment are adults while readers in the classroom-controlled experiment are teenagers. Another possible reason might have been the gender of the readers as in a classroom-controlled experiment all were female readers. Another possible reason might be the observer-participant bias in which readers' behavior gets affected by the presence of the investigator which leads to inconsistent results as compared to the experiments where the investigator is not physically present. We discuss more on this difference in the section where we explain the effect of sociolinguistic variables on comprehension and answer the RQ (ix) in that section.

4.4. Comprehension of Continuous and Discontinuous Paragraphs

In a web-based experiment, there is not much difference in the Exp1 which has continuous paragraphs (

Table 10) as the comprehension accuracy is a minimum of 94% and a maximum of 100%. On the contrary, in Exp2 which contains discontinuous paragraphs, we observe a remarkable difference for both paragraphs. Even though the maximum accuracy is 100% for both paragraphs, the minimum accuracy ranges from 69% to 81% stating a notable difference in the comprehension of NS. This difference is justified by the statistical significance test (Table 11) where we get a significant *p*-value, that is, 0.005 and 0 for Para1 and Para2 respectively. We argue that NS in a discontinuous text requires more mental effort as compared to both SV and CS. However, this difference cannot be seen when we present the text in continuation with earlier text which leads to the easier processing of NS since the context is presented.

Table 10: Comprehension Accuracy of NS, SV and CS in both paragraphs in both experiments

	Web-based Exp.				Classroom-controlled Exp			
	Exp1: Continuous Text		Exp2: Discontinuous Text		Exp1: Continuous Text		Exp2: Discontinuous Text	
	Para 1	*Para 2*	*Para 1*	*Para 2*	*Para 1*	*Para 2*	*Para 1*	*Para 2*
NS	94%	97%	81%	69%	93%	79%	54%	79%
SV	100%	100%	100%	100%	93%	75%	71%	82%
CS	100%	97%	100%	100%	82%	82%	96%	86%

Table 11: T-test results: Difference between comprehension of NS vs. SV vs. CS in a Web-based Experiment

	Exp1: Continuous Text				Exp2: Discontinuous Text			
	Para 1		*Para 2*		*Para 1*		*Para 2*	
	M_D	*p*	M_D	*p*	M_D	*p*	M_D	*p*
NS vs. SV	-0.06	0.08	0.03	0.16	-0.19	**0.005**	-0.31	**0**
NS vs. CS	-0.06	0.08	0	0.5	0.58	0.23	-0.31	**0**
SV vs. CS	0	-	0	0.16	0	-	-0.94	0.6

Now, the question that whether the same results can be found in a classroom-controlled environment too will be addressed. Referring to

Table 10, no type of sentence has 100% accuracy in either Exp1 or Exp2 in a classroom-controlled setting. The accuracy ranges from 75% to 93% for continuous text which is not remarkable as the *p*-value is insignificant (

Table 10). Nevertheless, the difference is significant for Para 1 in discontinuous text, that is, accuracy is 54%, 71%, and 96% for NS, SV, and CS respectively, the *p*-value for which is 0.08, 0, and 0 respectively (Table 12). In other words, CSs are processed in an undemanding manner than both NS and SV. However, there is no difference between NS and SV comprehension stating similar processing of them.

Table 12: T-test results: Difference between comprehension of NS vs. SV vs. CS in Classroom-controlled Experiment

	Exp1: Continuous Text				Exp2: Discontinuous Text			
	Para 1		*Para 2*		*Para 1*		*Para 2*	
	M_D	*P*	M_D	*P*	M_D	*P*	M_D	*P*
NS vs. SV	0	0.5	0	0.37	-0.2	0.08	0	0.36
NS vs. CS	0.1	0.08	0	0.36	-0.4	**0**	-0.1	0.23
SV vs. CS	0.1	0.08	-0.1	0.25	-0.3	**0**	0	0.35

To conclude, we address one of the research questions [RQ (v)] here: while the continuous text is processed easily in both web-based and classroom-controlled experiments, we can see a remarkable difference in NS processing in the discontinuous text in both types of experiments. Processing of discontinuous text which requires a reader to shift his/her attention became more difficult when NS is presented since NS itself needs more attention which makes it a high-load task to perform.

4.5. Comprehension based on sociolinguistic factors:

We have considered some sociolinguistic variables to answer the research question RQ (vi) to study the effect of readers' age, gender, and first language on the comprehension of three types of sentences (Table 13) in a web-based experiment. It is found that readers belonging to the age group of more than 30 years process NS more accurately than the readers below the age of 30 years (*p*-value is 0.03), especially in the discontinuous text. Similarly, they also exceed in the overall comprehension of all three types of sentences (*p*-value is 0.03 for both variables, that is, overall comprehension and NS comprehension).

Gender-based analysis suggests that male readers comprehend the NS in the continuous text better than female readers (a significant difference of 0.04). There is no such difference in the comprehension of all three types of sentences in a discontinuous text, viz. all sentences are processed in a similar manner by male readers. On the contrary, female readers do not show any difference in the comprehension of all types of sentences.

Based on the readers' native language, it is found that native speakers of Marathi have exceeded in overall comprehension of all three types of sentences in both experiments, continuous and discontinuous (*p*-value is 0.05 and 0.01 respectively) and also in processing the NS in both experiment (*p*-value is 0.04 and 0.01 respectively) than the non-native speakers. The early exposure to the language and the daily usage of the language might have a facilitating effect for the native speakers of Marathi while reading the colloquial Marathi texts.

Table 13: Sociolinguistic variables and Comprehension of NS, SV and CS: Web-based Experiment

	Age <30 vs. >30				Gender Male vs. Female				First Language Native vs. Non-native			
	Exp1		Exp2		Exp1		Exp2		Exp1		Exp2	
	M_D	*P*	M_D	*P*	M_D	*P*	M_D	*P*	M_D	*P*	M_D	*P*
Overall	0.08	0.1	0.24	**0.03**	0.04	0.22	0.04	0.37	0.23	**0.05**	0.41	**0.01**
NS	0.05	0.2	0.24	**0.03**	0.08	**0.04**	0.04	0.37	0.25	**0.04**	0.41	**0.01**
SV	0	-	0	-	0	-	0	-	0	-	0	-
CS	0.04	0.16	0	-	-0	0.16	0	-	-0	0.16	0	-

In a classroom-controlled experiment, all are female readers who are native speakers of Marathi. Only readers' age is considered to analyse the data from a sociolinguistic point of view (Table 14). We found that readers above the age of 18 years show differences in the comprehension of NS, SV, and CS in both types of texts. They also exceed the overall comprehension of all three types of sentences.

Table 14: Sociolinguistic variables and Comprehension of NS, SV and CS: Classroom-controlled Experiment

	Age 15 to 17 vs. 18 to 22			
	Exp1		Exp2	
	M_D	*P*	M_D	*P*
Overall	-0.48	**0**	-0.26	0.12
NS	-0.5	0.28	-0.26	**0.02**
SV	-0.23	**0**	-0.11	0.16
CS	-0.19	**0.02**	0.11	**0.04**

To conclude, continuity in the text facilitates the easier processing of nominal sentences and single-verb sentences. Against this, the discontinuity in the text not only requires more mental effort it also affects the accuracy of the comprehension of NS and SV sentences. Comprehension accuracy comes with age since readers above age 30 have comprehended NS in a better manner in a web-based experiment and readers above age 18 years have comprehended NS in a better manner. Similarly, male readers and native speakers of Marathi process NS in a better manner compared to female readers and non-native speakers respectively.

4.6. Comprehension Based on Textual Features

(a) The Difficulty Level of the Paragraphs

The majority of the participants in a classroom-controlled experiment have annotated the paragraphs as the most difficult except for two participants who have marked them as medium difficult ones. The participants that have found the texts difficult have scored around 66% accuracy in the experiment (Table 15). On the contrary, the majority of readers have annotated paragraphs as easy ones and have scored 100% accuracy.

Table 15: Textual features and Accuracy: Effect of difficulty level

Web-based Exp.	Classroom-controlled Exp.
Easy	*Most difficult*
100% accuracy	66% accuracy

Generally speaking, it can be straightforwardly concluded that the difference in accuracy in both experiments is due to the difficulty level as marked by the readers since participants in web-based experiments found paragraphs easy to process while participants in a classroom-controlled experiment found the texts difficult. However, we cannot neglect the fact that in the former experiment, all participants are adults, that is, belong to the higher age group as compared to participants in a classroom-controlled experiment, where all participants are just 15-22 years old. The difference in their accuracy in comprehension might betide due to the age gap which leads to the comparatively less amount of exposure to the language that teenage readers might have encountered. To account for the difference in accuracy between them, we have checked the instances where adult participants have marked the paragraphs as difficult and whether we can find the least accuracy in their comprehension. We found five such cases (P4, P7, P11, 20, and P24). These readers found the texts difficult and have scored 66% accuracy. Similarly, teenagers who have marked texts as medium-difficult (P6, P10, and P19) have scored 100% accuracy for those paragraphs. All these readers are native speakers of Marathi. This confirms that *age, language exposure, and the native language of the readers do not play part in the comprehension of colloquial Marathi language when the texts are difficult*. If the reader finds the text difficult, his comprehension gets affected and we find the least accuracy for respective texts regardless of their varied demographic data. Thus, here we address the research question [RQ (vii)] about the effect of textual difficulty.

(b) Familiarity with the Paragraphs

Readers were asked to annotate the text whether they are familiar with it or not. Usually, familiar texts are processed faster and with more accuracy. In our experiments, readers have unanimously marked the unfamiliarity with the texts in both experiments. Hence, we cannot analyze the data by taking familiarity as one of the textual variables. The same experiment with the same texts if conducted on a control group one who were already given these paragraphs for reading and on a control group two who was given these texts for the first time may shed some light on the effect of the familiarity in the process and accuracy of the comprehension. We consider this as future research.

(c) Difficulty Concerning Reading and Understanding as Annotated by Readers

The colloquial language is heard during daily communication and often in the movies by people more often than it is being read. We asked readers to mark the paragraphs concerning the reading and understanding difficulty such as:

(1) Easy to read and easy to understand (Easy-easy);
(2) Easy to read but difficult to understand (Easy-difficult);
(3) Difficult to read but easy to understand (Difficult-easy); and
(4) Difficult to read and difficult to understand (Difficult-difficult).

Table 16: Annotation by readers with respect to reading and understanding difficult of the texts in both experiments

Distribution of readers as per their Annotation about difficulty		
	Web-based Experiment	***Classroom-controlled Experiment***
(1) Easy- easy	30	15
(2) Easy- difficult	2	8
(3) Difficult- easy	4	5
(4) Difficult- difficult	0	0

The majority of the readers in both experiments have found the texts easy to read and easy to understand (

Table 16). A total of 10 readers found the texts easy to understand but difficult to read. It is crucial for us to check the accuracy of the readers who found the text difficult to understand if the comprehension is considered. Among a total of 10 such readers, five readers have scored 100% accuracy, and the remaining five readers have scored 66% accuracy or less. One reader (P 12 in a classroom-controlled experiment) who has scored less than 66% accuracy is a 16 years old female reader having Kannada (*Kannaḍa*) as her native language. She can be considered an outlier. Among the remaining nine readers, the least accuracy can be seen in a discontinuous text and not in a continuous text.

(d) Effect of Linguistic Exposure in terms of Regularity in Language Usage

Readers were asked to annotate whether they have daily/weekly/rare exposure to reading Marathi texts. Three readers who have rare exposure have scored the least accuracy, that is, less than 66% of accuracy in a classroom-controlled experiment. They are P11, P12, and P23. All of them are female teenager readers. While P12 is a Kannada speaker, the other two readers are Marathi native speakers. Similarly, three readers in a web-based experiment have annotated that they have weekly exposure to reading Marathi texts (P6, P16, and P27) although it is observed that all of them have 100% accuracy in comprehending all paragraphs. In other words, readers in the classroom-controlled experiment who have rare exposure have the least accuracy while readers in a web-based experiment

who have rare exposure do not have the least accuracy. It can be concluded that exposure to the language in terms of daily/ rarely reading Marathi texts does not affect comprehension accuracy.

Considering inter-variable features, we conclude that the difficulty of the Marathi colloquial language has an inhibiting effect on the comprehension among the Marathi readers, irrespective of their age, linguistic exposure in terms of years and language usage, and the native language. Thus, we address research question RQ (viii) above about the interplay between the variables.

4.7. Error Analysis

The basic discrepancy in the experiment design is the uneven distribution of the sample in two sets of experiments concerning age, gender, and native language. Since the readers in web-based experiments differ from the readers in a classroom-controlled experiment in terms of their demographic details, we cannot study the effect of the type of the experiment on the readers' comprehension viz. how the presence of the investigator in the classroom-controlled environment poses the Investigator-Participant bias and thus affects the readers' behavior, etc. A more refined and methodical investigation in the future will help us in deriving a precise conclusion only when the demographic details of the participants are kept constant and uniform.

Secondly, a total of 13 readers who took part in the experiment have been eliminated from the analysis procedure since they acquired less than 50% accuracy as stated earlier. Among them, three readers are male and seven are female readers belonging to the age minimum of 16 to a maximum of 34 years, having Telugu, Kannada, and Marathi as their native language. More than 50% of these readers have scored 0%, the reason for which is not apparent. Hence, we assumed that they might have performed inattentive reading and haphazard marking of the answers and decided to eliminate them from the data analysis procedure to avoid the skewing of the results. The remaining three readers have left a few answers unmarked (i.e., blank) in a classroom-controlled experiment, hence they were also removed from the overall data analysis.

Thirdly, even though in a web-based experiment, Marathi readers from across India have participated, in a classroom-controlled experiment, Marathi readers only from two cities in Maharashtra state have taken part. A few more tests on a different set of readers belonging to different regions in Maharashtra and India might give us some interesting results in the future.

Fourthly, to maintain readers' attention throughout the task, we only presented four paragraphs to each reader. It will be more insightful if varied texts are taken as a data set to study the nuances in colloquial language processing.

5. Some Observations and Discussion

The contrastive analysis of Marathi colloquial data with that of literary data (Gajjam and Kulkarni, 2020b) suggests that single-verb sentences in Marathi literary conversational data demand more mental exercise, especially for the people having the least linguistic exposure irrespective of their

age and first language. Daily exposure to the written Marathi texts has a facilitating effect on the comprehension of single-verbs (Gajjam and Kulkarni, 2020a). Coming to the nominal sentence, it is found that age and gender do not play any role in understanding NS. Additionally, NS are processed in a similar manner as SV sentences. This result differs from the colloquial data set. In Marathi colloquial texts, NS poses more mental load than SV and CS, more specifically if the text is discontinuous and if the readers found it difficult to comprehend irrespective of their age, gender, and linguistic exposure. The comprehension of colloquial texts might also differ when it is heard than when it is read. Hence, more experiments on spoken language comprehension will help derive a firm conclusion.

Similarly, the ancient Sanskrit grammarians such as Patajañli and Bhartṛhari in their respective works (i.e., in *Paspaśāhnika* of '*Mahābhāṣya'* and in *Brahmakāṇḍa* chapter of '*Vākyapadīya'* respectively) have discussed the concepts of the *sādhu* and *asādhu* words, that is, grammatically correct and incorrect words. Resorting on this discussion, the current research can be extended concerning colloquial language comprehension in other modern Indo-European languages.

6. Limitations and Future Scope

Limitations: Both web-based and classroom-controlled experiments are offline methods. They measure comprehension after readers have performed the task. Since we do not have access to the mental processes happening in readers' minds while they process the given sentence, we cannot go deeper into the real-time comprehension analysis. Similarly, the reaction time taken by the readers in marking the answers were not considered in both experiments. Offline methods, thus, rely completely on readers' honesty in marking the answers. Participants were asked to perform the attentive reading. Although there are many ways an investigator can retain participants' attention such as adding fillers, giving a small break in between many trials, and talking to the readers to relieve their tension etc., we did not use any of these since the sample size is small, that is, four paragraphs per experiment. We ensure readers' attention only by the means of the accuracy of the answers marked by them.

Future Scope: If extended, this research can be further replicated in other Indo-Aryan languages, using different kinds of texts and a different set of readers. It will provide more insights into the comprehension of nominal sentences which would answer the question of whether the provision of the copula is a language-specific feature of Marathi or is it a common human effort to try to have a complete cognitive experience. Similar experiments can be conducted on spoken language comprehension using recorded audio by using measures such as accuracy in response and recall, reaction time taken to respond, etc. A significant amount of such data will help us in modelling the language tools which would help in various Natural Language Processing applications such as WSD (Word Sense Disambiguation), WordNet, Shabda-mitra and Yogyatā tools,[28] and in several

[28] WordNet is a kind of dictionary that provides meanings of the words along with several other relations such as synonymy, metonymy etc. A few WordNets are found at: http://www.cfilt.iitb.ac.in/wordnet/webmwn/ (Marathi),

other computer-aided tasks such as parsing, Complex Word Identification, sentiment analysis, sarcasm detection and also in other machine learning applications. In the field of pedagogical studies, such data on human comprehension will be useful in creating some comprehension models, especially for people having reading disabilities due to several reasons. In the field of Sanskrit linguistics, one can explore several other sentence definitions given by different scholars belonging to different schools and understand the theories of verbal cognition in an explorative manner.

7. Conclusion

The conclusion of this research is provided as brief answers to the research questions. Based on the subjective reports of 95 Marathi native and non-native readers obtained from web-based and classroom-controlled experiments, it is concluded that:

(i) (SV= S)

The single-verb in Marathi colloquial conversations conveys the complete idea, hence it can be regarded as a complete sentence itself.

(ii) (CS > SV > NS)

The complete sentences are processed more successfully than the single-verbs and nominal sentences in which some words are omitted on the surface level. Single-verb sentences are comprehended more easily than nominal sentences due to the lack of a verb in the latter. In other words, a verb facilitates the cognition of any sentence.

(iii) If the context is presented, texts become easier to process. Hence, paragraphs in the continuation are comprehended more successfully than those which are in discontinuation with each other, with a different context.

(iv) Some sociolinguistic variables affect the sentence cognition process. Readers in a higher age-group process the sentences more accurately than the readers of less age adhering to the fact that they have more exposure to the language.

(v) The difficulty level of the text has an inhibiting effect on the comprehension of Marathi colloquial texts irrespective of readers' age, gender, and linguistic exposure.

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Acknowledgments

http://www.cfilt.iitb.ac.in/wordnet/webhwn/ (Hindi), http://www.cfilt.iitb.ac.in/indowordnet/ (Indo WordNet) and http://www.cfilt.iitb.ac.in/wordnet/webswn/english_version.php (Sanskrit) etc. These tools are developed by a group of research students at IIT Bombay with the guidance of Prof. Pushpak Bhattacharya and Prof. Malhar Kulkarni. More details on these and other tools can be found at http://www.cfilt.iitb.ac.in/Tools.html. (All the links are accessed on 14 July 2020.) Shabdamitra is a tool based on the Hindi WordNet that aids digital teaching and learning. (http://webdev.ircc.iitb.ac.in/research-glimpse/hindi-shabdamitra-digital-aid-language-teaching-and-learning) Yogyata tool is developed to capture the logical/ semantic compatibility of Sanskrit verbs concerning the *kārakas* mentioned in Sanskrit grammar. (The work is still in progress.) Both tools are developed by a group of linguistics and research associates at IIT Bombay under the guidance of Prof. Malahr Kulkarni and other faculty members.

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