RESEARCH ARTICLE

A Phonetic Description of Arabic Spoken by Indian Workers in Jordan

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ABSTRACT

This study aims to provide an analysis of the pronunciation of Jordanian Arabic sounds when uttered by some Indian workers in Jordan. The sample consisted of ten participants working at Al-Hassan Industrial City in Irbid, north Jordan. Information was collected via individual conversations during which the participants were shown pictures and then asked several questions about their contents, so that the number of words produced by each participant was fifty at least. The information was analyzed by transcribing the conversations, comparing the pronunciation of each sound with the original pronunciation in Jordanian Arabic, and then noting the similarities and differences. The study found that Indian Jordanian Arabic shares sounds with Jordanian Arabic and these are: (b, t, d, k, f, z, ʃ, d͡ʒ, n, r, and w), in addition to the identical sounds (ʔ, s, h, m, l, and j). These sounds are originally present in the phonological system of their mother tongue, and this helped the participants to pronounce them correctly in many cases. The study also found that there were at least 11 sounds that the participants could not pronounce correctly and these are: (ʕ, ħ, q, x, ɣ, tˤ, dˤ, sˤ, θ, ð, and ðˤ). The participants managed their pronunciation of these consonants by changing articulation point, articulation manner, deleting some difficult sounds, or replacing them with sounds from their mother tongue, creating an interlanguage peculiar to Indian workers. Regarding vowels, the Indian interlanguage was characterized by using the schwa instead of the vowel /a/ and the diphthong /aj/ instead of /e:/. The study recommends conducting research on other aspects of the Indian Jordanian interlanguage such as syntax, morphology and semantics.

Keywords: Jordanian Arabic; Indian Workers; Language Variations; Phonological Analysis; Al-Hassan Industrial City

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1. Introduction

Human communication is mainly achieved by language, the main tool that enables humans to express, understand, and exchange information[1]. Besides sharing information, this communication can happen for several reasons, such as immigration or travel for the purposes of tourism, work, and asylum[2]. Through communication between people from different linguistic backgrounds, languages affect each other, resulting in the formation of a mixed language, with hybrid phonology, morphology, grammar, and vocabulary. Different types of languages may arise as a result of this influence, including pidgin and creole[3–6].

Because Jordan is a politically stable and safe country in the midst of a troubled region, people from different nationalities with different cultures and languages/dialects are attracted to it for asylum or work[7]. This cultural and linguistic diversity made Jordan have a number of linguistic variations, that are a mixture of Jordanian Arabic and the original language/dialect of a particular nationality (e.g., Jordanian and Syrian dialects as in[8]).

The current study attempts to provide a phonetic description of Indian Jordanian Arabic (IJA), which is spoken by several hundred Indians working in clothes factories in Irbid, Jordan. Phonological or phonetic analysis refers to the process of examining the sound patterns of language and identifying the underlying rules that govern these patterns. It can be used to describe the sound system of a particular language or dialect, to compare the sound systems of different languages or dialects, and to identify patterns of sound change over time[9]. This analysis is crucial in studying and determining linguistic interference as it provides a detailed examination of the sound systems of languages in contact. The analysis involves identifying the phonemes (distinct sounds) and their distribution in the language, the rules that govern their combination, and the patterns of stress, tone, and rhythm[10].

When two or more languages come into contact, they may influence each other's sound systems, resulting in phonological interference. Phonological interference can manifest itself in various ways, such as the transfer of phonetic features, the borrowing of words or sounds, or the adoption of new phonological patterns[11]. By analyzing the phonology of languages in contact, linguists can identify the specific types of interference and determine the extent and direction of the influence. This information can help in understanding the historical and cultural contexts of language contact, as well as the social and linguistic factors that contribute to linguistic interference[11].

Through contact with some Indian workers residing in Jordan, the researchers have noticed that there is a simple language that serves as a communication tool between these workers and Jordanian Arabic speakers. Although this language is close to Jordanian Arabic, it is noted that there are a number of changes made by these workers in the sounds used. This issue is worth investigating as it was found upon literature review that few researches have been conducted on the phonological system used by foreign employees working in Jordan, while there was a complete absence of phonological studies dealing with Indian workers in this country.

Foreign workers in Jordan are employed in various sectors, especially construction (mostly Egyptians), domestic work (mostly Indonesians and Philipinas), garment factories (Indians, Chinese, and Benghalis) and agriculture (Egyptians and Pakistanis). (Information taken from the Jordan Times, Human Rights Watch and FAO) Based on the Annual Report of the Ministry of Labor of 2021, there were approximately 333,283 licensed foreign workers in Jordan, representing about 30% of the workforce in the country. Most of them are located in Amman and Irbid. According to the Annual Report of the Ministry of Labor, the number of Indian workers in Jordan was 16,000 in 2021, representing 4.8% of the total immigrant workers. Indian workers in Jordan are mostly employed in garment factories and agriculture. Due to their limited exposure to the language, Indian workers speak Arabic with a distinct accent influenced by their native language, and Malayalam. They also use loanwords from this language or English in their Arabic speech, or mix Arabic with Malayalam or English.

2. Literature Review

A number of works have studied the forms of languages resulting from contact between Arabic and other languages. For example, Al-Abed Al-Haq and Al-Salman[12] showed that the phonology of the Jordanian Arabic spoken by Bengalis was not fully compatible with that of JA and that JA sounds tended to change a lot. In syntax, the verbs were sim-

plified and invariant. In addition, negation was realized by three simplified negative particles only, as opposed to Arab speakers who use ten particles. Moreover, Al-Salman[13] stated that this language form has the characteristics of a "pre-pidgin" rather than a "stable pidgin".

In addition to Almoaily[14] who discussed variation in Gulf Pidgin Arabic, Potsdam and Alanazi[15] proposed a unified analysis of the preposition /في/ 'in/there's' in this variety, and found that it has several uses such as: a preposition, an existential expletive, and the verb of possession 'have'.

Avram[16] discussed "Romanian Pidgin Arabic" that was used by Romanian and Arab oil workers in Iraq. He found that the verbal system in RPA is invariant in form, while there is an absence of tense, aspect markers and copula. He also found that the preposition /الى/ 'to' is used for direction and possession and that the expletive 'there' is expressed by the word /أكو/, while the English word (no) is used for negation.

Furthermore, Bakir[17] studied the verbal system of Gulf Pidgin Arabic, and concluded that the common verb form in GPA is that of the unmarked 3rd singular masculine imperfect used to express present, past and future actions. Earlier, Næss[18] investigated whether the Gulf pidgin Arabic GPA is considered as "true pidgin" or if it is just "an individual strategy" used for communication. He proposed that the Gulf Pidgin Arabic is a variety on the way to becoming conventionalized and unified as a first-generation contact language which has emerged in a situation of a social gap. Structurally, it resembles an early "interlanguage" variety, but the factors surrounding it place it within the sociological definition of a pidgin.

Yasser[19] attempted to describe and analyze Arabic pidgin spoken by some foreign nationals in Saudi Arabia as opposed to the ordinary Saudi dialect. The findings show that its users have various phonological discrepancies in their production of Arabic vowels and consonants, whereas SAs lack these discrepancies.

Tosco[20] examined the verbal system in Juba Arabic (South Sudan) and found that it has many characteristics of typical creoles, including the expression of different tense, values through preverbal markers, and the division of the verbal lexicon between stative and nonstative verbs, which are distinguished by verbal markers and the different value of the verbal form when used without markers. He also found that Juba Arabic shares a common lexifier and substrata, as well as the same historical origin, with another pidgin called Ki-Nubi.

3. Method

The study population is the Indian workers in Al-Hassan Industrial City, a complex of clothes factories located 15 kms. to the east of Irbid City. Most of the workers, whose number is a few hundreds, live in workers' housing in the nearby city of Ramtha, in northern Jordan. A convenient sample of 10 participants, five males and five females, was chosen. They were aged 35–50 and had worked in Jordan for a period of 2–7 years. The following table (**Table 1**) shows the participants' information.

Table 1. Participants' information.

Participants	Age	Gender	Length of Stay in Jordan
P1	32	Female	3 years
P2	41	Female	6 years
P3	38	Female	5 years
P4	44	Female	7 years
P5	33	Female	2.5 years
P6	33	Male	2 years
P7	45	Male	7 years
P8	40	Male	4 years
P9	37	Male	6 years
P10	39	Male	6 years

Data were collected by recording interviews with participants, who were shown pictures and asked to describe them using Arabic words or short sentences. All the participants could produce a minimum of fifty lexical words in isolation or in sentences to comment on the picture description task. The pictures were shown according to certain criteria, including that the picture be clear, simple and uncomplicated, and contain only one topic. In general, the participants were asked about names of familiar animals, common colors, foods, and tools they use at work and sometimes about their impression of the subject of the picture. Information was collected over approximately 6 hours spread over two days, 12/25–26/2023.

After collecting the data, the researchers analyzed the information obtained and described them in terms of the phonological structure of the words elicited from the participants. The data was analyzed using the qualitative descriptive method, not the statistical one. This is because the statistical study requires a large number of participants, and this makes it very difficult to capture all the voice changes for all participants.

Following the theories of phonetic/phonological analysis[21, 22] of recorded speech, the researchers adopted the following steps during the process of analyzing information:

1. Listen to the recorded conversations individually.
2. Write the sound variations for each participant.
3. Collect the sound variations for each sound separately.
4. Display sounds and their variations according to the place and manner of articulation.
5. Describe the variations of each sound, and compare them with the basic phoneme in Jordanian Arabic, with illustrative examples from the conversations.
6. Discover the participants' ways of pronouncing different sounds.

4. Results

This study is based mainly on comparing JA phonology with that spoken by the Indians workers, so as a necessary introduction, essential information about Jordanian Arabic is presented in this section.

Jordanian Arabic refers to a range of Arabic dialects spoken by the people of the Hashemite Kingdom of Jordan. These dialects form a continuous spectrum of mutually understandable varieties. Jordanian Arabic dialects are used by over 6 million people (Ethnologue website: South Levantine Arabic). As in most Arab countries, language usage in Jordan displays diglossia, with Modern Standard Arabic serving as the official language for written documents and media, while everyday conversations take place in local colloquial varieties.

While there is a generally understood Jordanian dialect shared by most Jordanians, the spoken language in different regions of the country exhibits significant variations in pronunciation, grammar, and vocabulary. According to Palva[23, 24] and Younes and Herin[25], Jordanian Arabic (JA) can be categorized into sedentary and Bedouin varieties, each of which further comprises distinct subgroups. The sedentary varieties are divided into three basic varieties: Modern Jordanian (Ammani Arabic, which developed in the 20th century as a result of an amalgamation of linguistic elements between East Jordanian residents or immigrants from north and south Jordan and Palestinian immigrants since 1948), Balgawi-Horani (spoken by most people in central and north Jordan) and the Southern dialect (Karak, Maan and taafilah). We are concerned here with the second subdialect because it is spoken by the people where our Indian subjects work and reside[25, 26].

The Bedouin dialects are very diverse but in general they comprise three groups: The Northwest Arabian Arabic in Southern Jordan, North Arabian Bedouin in northeast Jordan, and Syro-Mesopotamian Bedouin dialects in the east[23].

Since this study deals with a phonetic description of the Arabic interlanguage used by Indian workers, it is important to show first the consonants of Jordanian Arabic. In addition to the known Arabic consonants and according to Al-Wer et al.[27], three additional sounds are used in JA, namely:

1. The voiceless post alveolar affricate /t͡ʃ/ as an alternative to the letter /k/ in some contexts.
2. The voiced velar stop /g/ as an alternative to the voiceless uvular stop /q/ in rural and Bedouin accents.
3. The interdental emphatic frincative /ðˤ/ as an alternative to the emphatic dento-alveolar plosive /dˤ/. **Table 2** below illustrates the consonants of Jordanian Arabic.

According to Sawaie[28], JA has 10 vowels, the six well-known Standard Arabic vowels in addition of the short and long close-mid back rounded vowel: /o/ and /o:/, and the short and long close-mid front unrounded vowel: /e/ and /e:/. See the JA vowel **Table 3** below.

Table 2. JA Consonants.

| | | Bilabial | Labio Dental | Interdental | | Dental Alveolar | | Palatal | Velar | uvular | Phary Ngeal | Glottal |
				Plain	Emph.	Plain	Emph.					
Stop/plosive	v.l					t	tˤ		k	q		ʔ
	v	b				d	dˤ		g			
Fricative	v.l		f	θ		s	sˤ	ʃ	x		ħ	h
	v			ð	ðˤ	z		ʒ	ɣ		ʕ	
Affricative	v.l							t͡ʃ				
	v							d͡ʒ				
Nasal		m				n						
Tap/Trill						r						
Approximant						l		j	w			

Table 3. JA Vowels.

| | Front | | Central | | Back | |
	Long	Short	Long	Short	Short	Long
Close	iː	ɪ			u	uː
Close mid	eː	e			o	oː
Open mid						
Open			aː	a		

Phonetic analysis made it clear that Indian workers pronounced correctly a large number of JA consonants, which had equivalents in their native language. However, many stops and fricatives were mispronounced through processes like sound substitution, feature addition (aspiration or retroflex quality), and deletion. The sounds which posed problems for these workers are discussed in what follows.

4.1. Bilabial Stops

Most participants pronounced /b/ as a voiced bilabial plosive like JA, while some of them replaced it with the voiceless bilabial plosive /p/, a phoneme not found in JA but common in Indian languages. Example 1 illustrates this.

4.2. Dental/Alveolar Stops

Participants often pronounced the voiceless alveolar plosive /t/ in one of three ways, producing what is called substitution or feature addition. Some of them pronounced it as a voiceless retroflex stop /ʈ/, while some of them replaced it with the voiceless aspirated alveolar plosive /tʰ/. Still, others pronounced it as a voiceless retroflex aspirated stop /ʈʰ/. Examples 2, 3, and 4, illustrate these changes respectively.

Example (1): the sound (b→ p̲)
"Hada pahar hawa hilw, bas ana ma yarif yisbah" JA: /baħar/)
Trans. This is a sea, its air is beautiful, but I don't know how to swim.
Context A picture of the sea was shown; then the participant was asked if he would like to visit it.

Example (2): the sound (t→ ʈ)
" ʈiːmsaːh haːjawaːn jaːkul ʔinsaːn" (JA: /timsaːħ/
Trans. Crocodile is a dangerous animal that eats man.
Context A picture of a crocodile was shown, and the participant was asked about the name of the animal in the picture.

Example (3): the sound (t→ tʰ)
"ʔanaː maː jhib tʰaːmir, hiːlu kiːr" (JA: /tamir/)
Trans. I don't like dates, they are too sweet.
Context A picture of dates was shown; then the participant was asked if he/she liked them or not.

Example (4): the sound (t→ tʰ)

"fi: ʔndʲia fi: be: bæ:ba: t̪ʰu:t̪ʰ ʔæhmæ:r wæ ʔabjæ:ɖ" (JA: /tu:t/)

Trans.	In my father's house in India there are red and white berries.
Context	After being shown a picture of a mulberry fruit, the participant was asked whether mulberry is grown in India or not.

The voiced alveolar plosive /d/ was also often pronounced as a voiced retroflex plosive /ɖ/, as shown in example 5.

The participants could not produce the two JA emphatic alveolar /tˤ/ and /dˤ/ (the second is often pronounced /ðˤ/ by many Jordanians); instead, they replaced them with the non-emphatic counterparts /t/ and /d/. Still, some of them pronounced them as retroflex // and /ɖ /. Examples 6,7, 8 and 9 illustrate this.

4.3. Velar and Uvular Stops

The sound /k/, a voiceless velar plosive, was often pronounced as in JA, but some workers pronounced it as a voiceless, aspirated velar stop /kʰ/, as shown in example 10.

Example (5): the sound (d→ ɖ)

"lā lā, ʔānā mā ysūf ɖūb fī ʔndʲiā" (JA: /dub/)

Trans.	No no, I have never seen a bear in India.
Context	The participant was asked if he/she had met a real bear before, after a picture of a bear was shown.

Example (6): the sound (tˤ → t)

"'ʔana: bero:h bila:d fi tija:ra, mo:mki:n 'ʔaʃra sa:ʔa" (JA: /tˤija:ra/)

Trans.	I go to my country by plane, it can take ten hours.
Context	The participant was asked about how he/she traveled to India and how long the journey would take.

Example (7): the sound (tˤ → t̪)

" t̪ahi:n kti:r ju:tbu:k ʔakil, mumkin sawi kubu:z, sawi ki:k" (JA: /tˤaħi:n/)

Trans.	Many foods are cooked from flour, such as bread and cake.
Context	A picture of flour was shown, then the participant was asked about its uses.

Example (8): the sound (dˤ → d)

"mamnu judrub **bat͡ʃa** (Indian word meaning 'children'), hara:m sagi:r ma: juruf" (JA: /judˤrub/ or /juðˤrub/)

Trans.	It is forbidden to hit children, it is forbidden because he is too small to know anything.
Context	The participant was asked how many children he/she had, and then asked if he/she hit them if they made a mistake.

Example (9): the sound (dˤ → ɖ)

"ʔa, fi dofɖa kti:r fi ʔndia, sut ʔa:li: ktir "(JA: /ðˤufdaʕ/

Trans.	Yes, there are a lot of frogs in India; sound is very loud.
Context	A picture of a frog was shown, and the participant was asked if he/she had actually seen a frog.

Example (10): the sound (k → kʰ)

"ʔana sagi:r kʰan fi jisbah, hasa ʔana kʰabi:r, kʰ la:s fi taa:b bsura "(JA: /kan/ and /kabi:r/)

Trans.	I used to swim when I was little, but now I'm older and get tired quickly.
Context	A picture of the sea was shown, and then the participant was asked if he/she knew how to swim.

The voiceless post alveolar affricate /t͡ʃ/, a variant of /k/ in JA was not used by the subjects although it exists in their language as in the word (bat͡ʃa) which means 'children' (see example 8). However, they used it when imitating some Jordanian speakers, as illustrated in example 11.

The Standard Arabic voiceless uvular stop /q/ is primarily pronounced /g/ (voiced velar stop) in Jordan, but some Jordanians from Palestinian origin pronounce it as /k/ (voiceless velar stop) and some urbanites, influenced by the Lebanese and Damascus Syrians, replace it with the glottal stop /ʔ/. Most participants pronounced /q/ as /g/ like most Jordanians, while few of them pronounced it as /ʔ/ and as

/k/. Still, some of them, probably influenced by their native language, pronounced it as a voiceless aspirated velar stop /kʰ/. Examples 12, 13, 14, And 15 illustrate these 4 pronunciations.

Example (11): the sound (k → t͡ʃ)

"ha:d zalama fi matam jgu:l t͡ʃif ḥalak ammi:? "

The man in the restaurant says: How are you, Uncle?.

Context: The participant was asked if he/she had heard someone pronounce /k/ as /t͡ʃ/. He/She did not understand at first, but when we gave him/her examples, he/she said the word with this sound, which means 'how'.

Example (12): the sound (q → g)

"mansaf w maglubah zaki, bas lazim laha:m, mɑmnu dad͡ʒad͡ʒ "

Trans   Mansaf and maqloubah (well-known Jordanian dishes) are delicious, but they should be made with meat, not chicken.

Context   The participant was asked if he/she had tried Jordanian food, and whether he/she liked it or not.

Example (13): the sound (q → ʔ)

"ma:ma ka:n ygu:l ha:ti ʔalam ya ʔalbi: "(JA: /galam/ and /galbi:/

Trans   My mother (here 'female boss') used to say to me: Bring the pen, my heart

Context   A picture of a pen was shown, then the participant was asked about its name.

Example (14): the sound (q → k)

"kamar hilu, ʔana biddi kti:r ʃu:f kamar fi: lel" (JA: /gamar/

Trans   The moon is beautiful, I love watching the moon at night.

Context   A picture of a sea with a moon above it was shown, and the participant was asked to describe the picture.

Example (15): the sound (q → kʰ)

"ʔana **sæm sæm** baba, ʔana tawil shwai bas baba kʰaṣi:r bas **vɛri strɔng** " (JA: /gaṣi:r/; the words in bold are code-switched from English)

Trans   I look like my dad, but a little taller, my dad is short but very strong.

Context   The participant was asked about his father, whether he was alive or not, and if he looked like him or not.

4.4. Labio-Dental Fricatives

Out of the 13 fricatives in JA, the subjects could pronounce correctly five only: /f, s, z, ʃ, and h/. They had problems with the 8 others. The voiceless labiodental fricative /f/ was mostly pronounced correctly, but some participants replaced it with the voiced labiodental fricative /v/. The next example shows that.

4.5. Interdental Fricatives

The two JA's interdental fricatives /θ/ and /ð/ were never used by the subjects. Instead, they replaced the voiceless /θ/ with the voiceless alveolar fricative /s/ or voiceless alveolar plosive /t/. Similarly, they converted the voiced /ð/ into the voiced alveolar fricative /z/ or the voiced alveolar plosive /d/. (See[8] for similar pronunciations by Syrians living in Jordan). Examples 17–20 illustrate this substitution, which is normal for most Indians when they speak a foreign language. As is well-known, Indian languages have neither /θ/ nor /ð/.

4.6. Dental/Alveolar Fricatives

The voiced alveolar fricative /z/ was mostly pronounced correctly, but some participants substituted it with the voiceless alveolar fricative /s/. and few participants pronounced it as a voiced post-alveolar fricative /ʒ/. Examples 21, 22 clarify that.

The voiceless emphatic alveolar fricative /sˤ/ was changed into the voiceless non-emphatic alveolar fricative /s/. See example 23.

4.7. Palatal Fricatives

The voiceless palato-alveolar fricative /ʃ/ was pronounced correctly by most participants. Nevertheless, some pronounced it as a voiceless alveolar fricative /s/. Look at example 24.

Example (16): the sound (f → v)

"mansɑf fi: ru:z w lɑbɑn, bəkdu:ni:ʃ, vusdək w lɑ:zim lɑhɑ:m" (JA: /fu:sdək/ (JA: /fusduk/

Trans. Mansaf has rice, yoghurt, parsley and pistachios, and it must have meat.

Context The participant was asked if he/she could make mansaf.

Example (17): the sound (θ → s)

"hɑ:d sa:lab sari kɑti:r, inta fi: ma:lum fi ʔndia fi sa:lab bteir? "(JA: /θa:lab/

Trans. The fox is very fast, did you know that in India there is a fox that can fly?

Context: A picture of a fox was shown, and then the participant was asked to name the animal.

Example (18): the sound (θ → t)

"ana jusku:n fi: ramta ma sadik kɑti:r "(JA: ramθa)

Trans. I live in Ramtha with many friends.

Context: The participant was asked about his/her place of residence.

Example (19): the sound (ð → z)

"ʔana jiraf **kurn** zura, ha:d mia: mia: "(JA: /ðura/)

Trans. I know it, this is corn, and it tastes great.

Context: A picture of corn was shown and the participant was asked if he/she liked it.

Example (20): the sound (ð → d)

"dɑhɑb hi:lu: bas gali, ʔnɑ: sugu:l, bɑdi:n jɪdʒi:b dɑhɑb ɪnʃɑ:lɑ: "(JA: /ðahab/)

Trans. Gold is beautiful but expensive. I will work and then I will buy gold, God willing.

Context: A picture of a golden ring was shown, then the participant was asked if she liked jewelry made of gold or not.

Example (21): the sound (z → s)

"baˡr lon ʔasrak, wsama: kama:n lon ʔasrak" (JA: ʔazrag/)

Trans. The sea is blue, and the sky is blue too.

Context: A picture of the sea was shown, and the participant was asked about its color.

Example (22): the sound (z → ʒ)

"ma: yʃu:f , bas ʒara:fa tawi:l kti:r "(JA: /zara:fa/)

Trans. I haven't seen it, but the giraffe is very tall.

Context: A picture of a giraffe was shown, and then the participant was asked about the name of the animal, and if he/she had actually seen it.

Example (23): the sound (sˤ → s)

"ʔoh, sija:d jmsik gaza:l sagi:r, ʔna: ma: jira:f kef taam" (JA: /sˤ iya:d/; /sˤaɣi:r/)

Trans. Oh, a hunter catches a young deer, I don't know what it tastes like.

Context: A picture of a hunter hunting deer was shown; then the participant was asked to describe the picture and tell us if he/she had eaten deer meat before.

Example (24): the sound (ʃ → s)

"hot sama fi kek eid melad, bas kʰati:r, lazim entibeh")JA: /ʃamiʕ/)

Trans. We put candles in the birthday cake, but be careful because candles are dangerous.

Context: A picture of candles was shown, and then the participant was asked about their name and uses.

4.8. Velar Fricatives

Both velar fricatives /x/ and /ɣ/ were substituted by other sounds. The voiceless /x/ was replaced by the voiceless, aspirated velar stop /kʰ/, and in a few cases by the voiceless glottal fricative /h/. The voiced /ɣ/ was replaced by the breathy voiced velar fricative /gɦ/, and sometimes into the voiced velar stop /g/. Examples 25–28 are illustrations of these pronunciations.

Example (25): the sound (x → kʰ)

"laham kʰəru:f mi:a mi:a, momkin kʰəro:f sagi:r yzi tari kti:r" (JA: /xaru:f/

Trans.   Lamb is very good, and if the sheep is young, the meat is very tender.

Context: A picture of a sheep was shown and the participant was asked if he/she ate lamb or not.

Example (26): the sound (x → h)

"sai:tun ʔahda:r za:ki aktar min aswad" (JA: /ʔaxdˤar/

Trans.   Green olives are tastier than black.

Context: A picture of olives was shown, and the participant was asked if he/she liked them or not.

Example (27): the sound (ɣ → gʱ)

"daha:b ahla, bas ʔana fi: silvɜr (English word) ʔalaʃa:n daha:b gʱa:li" (JA: /ɣa:li/)

Trans.   Gold is more beautiful, but I have silver because gold is expensive.

Context: A picture of a gold ring was shown and the participant was asked if she liked gold or silver.

Example (28): the sound (ɣ → g)

"gassala muhim kti:r, ʔalaʃa:n ygsil malabis sari sari" (JA: /ɣassala/; /yɣsil/

Trans.   The washing machine is very important because it washes clothes quickly.

Context: A picture of a washing machine was shown, and then the participant was asked whether she owns one or not, and why she uses it.

4.9. Pharyngeal Fricatives

Similarly, the pharyngeal fricatives /ħ/ and /ʕ/ were not used by the subjects. The voiceless /ħ/ was replaced with the voiceless glottal fricative /h/, and /ʕ/ was pronounced as the voiceless glottal stop /ʔ/, or deleted all together if preceded by the vowel /a/. Examples 29, 30 and 31 are illustrations.

Example (29): the sound (ħ → h)

"fi: tofa:h ʔahmar, fi: ʔasfa:r, fi: ʔahda:r, bas ʔana ma: jihib tofa:h" (JA: tofa:ħ/; /ʔaħmar/; /jiħib)

Trans.   There are red, yellow, and green apples, but I don't like apples.

Context: A picture of apples was shown, then the participant was asked about the kind he/she prefers.

Example (30): the sound (ʕ → ʔ)

"ʔinab ku:ayis bas ʔana jihib batti:kʰ ʔaktar" (JA: /ʕinab/)

Trans.   Grapes are good but I like watermelon more.

Context: A picture of grapes was shown, and then the participant was asked about its name, and whether or not he/she liked it.

Example (31): the sound (ʕ → a)

"ʔana yaraf ismak bas ʔinta ma yaraf ism ʔana" (JA: yaʕraf)

Trans.   I know your name, but you don't know mine.

Context: The participant joked with the researcher when he asked him/her about his/her name.

4.10. Other Consonants

The **Table 4** below shows the remaining seven JA consonants and their correspondents in the Indian pronunciation. They include one affricate, two nasals, one tap/trill, and three approximants.

Some participants pronounced the voiced palatal affricate /d͡ʒ/ as the voiced postal-veolar fricative /ʒ/, similar to some urban Jordanian accents, and sometimes as /z/. Look at examples 32, 33.

Both voiced alveolar nasal /n/ and voiced alveolar or postalveolar approximant /r/ were often shifted to their retroflex counterparts: the voiced retroflex nasal /ɳ/, and the voiced retroflex alveolar /ɽ/. Check examples 34 and 35.

Sometimes, the participants changed the voiced labio-velar approximant /w/ to the voiced labiodental fricative v. See example 36.

Table 4. Other consonants.

Art. Point	Manner of Art.	Arabic Symbol	JA Sound	IJA Sound
Affricative	Palatal	ج	d͡ʒ/ ʒ	d͡ʒ/ ʒ/ z
Nasal	bilabial	م	m	m
	Dental	ن	n	n/ ŋ
Tap/Trill	Dental	ر	r	r/ ɽ
Approximant	Dental	ل	l	l
	Palatal	ي	j	j
	Velar	و	w	w

Example (32): the sound (d͡ʒ → ʒ)

"beːt ?ana fi aʒaːr ktiːr, ?ana yhib ʃaʒar w yizra, bas mama yizra ?alasaːn ?ana fi sogul fi **dʒɔrdan**" (JA: ?aʃd͡ʒ aːr/)

Trans: My house has many trees. I love trees and farming, but my mother plants because I work in Jordan.

Context: A picture of a house surrounded by trees was shown, and then the participant was asked if it was similar to his/her house in India.

Example (33): the sound (d͡ʒ → z)

"zamal fiː sahara, ?ana maː jiʃuːf fiː ?india" (JA: /d͡ʒ amal/)

Trans. The camel lives in the desert, I do not see it in India.

Context: A picture of a camel was shown; then the participant was asked if he/she had seen it in reality.

Example (34): the sound (n → ŋ)

"?arŋab miskiːn, ŋamiɾ jaːkʊl ?arŋab" JA: /?arnab/)

Trans. Poor bunny, tiger eats bunny.

Context: A picture of a tiger and a rabbit was shown; then the participant was asked who is the stronger and faster among them.

Example (35): the sound (r → ɽ)

"fatuːɽ fiː ?india bed, baɽata, ʃai kaɽak mumtaːz" (JA: /faTuːr; barata; karak/)

Trans. Breakfast in India consists of eggs, paratha and excellent Karak tea.

Context: The participant was asked about food in India.

Example (36): the sound (w → v)

"ma bihib tiːn aswad v akdar" (JA: /w/)

Trans. I don't like black and green figs.

Context: The participant was shown a picture of figs, and that was his/her reaction.

4.11. Vowels

Regarding vowels in their JA words, Indian workers used two phonological processes: adding new vowels and frequent vowel substitution.

4.11.1. New Vowels

As previously mentioned, JA has 10 vowels. However, the subjects used two additional vowels in their pronunciation of JA words: the mid central vowel /ə/ (the schwa, which is commonly found in Indian languages) and the diphthong /aj/ (found in Standard Arabic and some Arabic dialects but not in JA). The next two examples illustrate.

The second vowel (/aj/) is found in standard Arabic, but not in JA, where it is pronounced as /eː/ in JA. Have a look on example 38.

4.11.2. Vowel Substitution

All participants often used long vowels instead of short ones, and vice-versa. No explanation could be found for these frequent changes. The examples in (39) illustrate this process.

Example 37: vowel /ə/		
Pronounced word	Instead of	Meaning
/dahəb/	/ðahab/	Gold
/taləb/	/θaʕlab/	Fox
/lahəm/	/laħim/	Meat
/nəm/	/na:m/	Sleep (v.)

Example 38: vowel /aj/		
Pronounced word	Instead of	Meaning
/lajmu:n/	/le:mu:n/	Lemon
/zajtu:n/	/ze:tu:n/	Olives

Example 39: switching vowels.			
Type	Pronounced word	Instead of	Meaning
Replace a with a:	/saka:n/	/sakan/	Housing/Dorm
Replace a: with a	/bab/	/ba:b/	Door
Replace u with u:	/ru:z/	/ruz/	Rice
Replace u: with u	/sura/	/ sˤu:rah/	Picture
Replace i with i:	/si:r/	/sirr/	Secret
Replace i: with i	/tahin/	/ tˤaħi:n/	Flour
Replace o with o:	/so:ra:/	/sorʕah/	Speed
Replace o: with o	/lon/	/lo:n/	Color

5. Discussion

The paper has sought to describe the phonetic system of the Arabic used by some Indian workers who have spent no less then two years in Jordan. The results show that this system combines some of the characteristics of JA and those of the workers' mother tongue. In accordance with previous studies[29, 30], the convergence and mixing of the two phonemic systems of these two languages led to the emergence of some changes that mainly include consonant and vowel substitution, feature addition (aspiration and retroflex characteristics), consonant deletion, and vowel addition. Regarding consonant substitution, similar results are found in Bader and Al-Ali[8] in the description of Syrian refugees' speech in Jordan. The speakers' mother tongue/dialect seems to be the main reason behind these changes[31, 32].

In order to interpret the workers' new phonetic system, it might be useful to compare it with the Indian phonetic system in **Tables 5** and **6** below. (Source:[33]).

Table 5. Consonant phonemes of Malayalam.

Art. Points / Manners		Labial	Dental/Alveolar	Retroflex	Post-alv./Palatal	Velar	Glottal
Nasal		m	n	ɳ	ɲ	ŋ	
Stop/Affricate	**voiceless**	p	t	ʈ	t͡ʃ	k	
	voiceless aspirated	pʰ	tʰ	tʰ	t͡ʃʰ	kʰ	
	voiced	b	d	ɖ	d͡ʒ	g	
	voiced aspirated	bɦ	dɦ	ɖɦ	d͡ʒɦ	gɦ	
Fricative	**voiceless**	f	s	ʂ	ʃ		
	voiced	ʋ	z		ʒ		ɦ
	Approximant		l		j		
Tap/Trill	**unaspirated**		r	ɽ			
	aspirated			ɽɦ			

Table 6. Malayalam vowel phonemes.

	Front		Central	Back	
	Long	**Short**		**Short**	**Long**
Close	iː	ɪ		ʊ	uː
Close mid	eː				oː
Open mid	ɛː		ə		ɔː
Open	æː		aː		

Reviewing **Tables 5** and **6** and comparing them with **Tables 1** and **2**, we find that the Indian speakers borrowed some widely used sounds from their mother tongue's phonetic system to substitute for some JA sounds difficult for them to produce, e.g. adding the sounds /p/ and /v/, which do not exist in JA, adding retroflex and aspiration features to JA sounds, or using breathy voices. It is clear that the origin of these processes stem from their mother tongue.

Moreover, the subjects were unable to pronounce many emphatic, pharyngeal and laryngeal consonants of JA because they did not exist in their language. They either omitted them altogether or replaced them with other sounds. For example, they replaced the pharyngeal fricative /ħ/ with the glottal fricative /h/, and the pharyngeal fricative /ʕ/ with the glottal stop /ʔ/. The uvular /q/ was replaced by the velars /g, /k/ or the aspirated sound /kʰ/. The velar fricatives /x/ and /ɣ/ were substituted for by aspirated /kʰ/ and the breathy/ gɦ/, respectively. The emphatics /tˤ, sˤ, dˤ, and ðˤ/ were replaced with the plain or non-emphatic /t, s, and d for both: dˤ and ðˤ/. Finally, the interdentals /θ/ and /ð/ were replaced mostly with the dental stops /s/ and /t/. According to many scholars, pronouncing these JA correctly can be difficult for learners from various nationalities, due to insufficient practice and lack of familiarity with the specific articulation [34–36].

Findings by some previous studies that dealt with the Arabic varieties spoken by Indians (e.g.,[12, 37–39]) agree with many of the current study's findings. These studies lacked the detailed phonetic description of the present only since they dealt with all aspects (syntactic, morphological and semantic) of the Indians' interlanguage; they only dealt slightly with the phonetic aspect. For example, no study investigated the retroflex or aspirated sounds of the Arabic interlanguage spoken by Indian workers.

The present study's findings are also similar to those by other studies that dealt with the kind of English spoken by some Indians[33, 40–43], especially regarding feature (retroflex and aspirated) addition and sound substitution.

Regarding vowels, Indian workers' JA pronunciation was characterized by the use of the vowel schwa to substitute for the low short vowel /a/ and by the use of the diphthong /aj/ instead of /eː/. The diphthong is found in some Arabic dialects like the Lebanese one, but not in the typical rural Jordanian variety. Multiple switches between short and long vowels, and vice-versa, were frequently noticed. These need further explanation in future studies.

6. Conclusions

The study has provided an analysis of the kind of Arabic spoken by Indian workers in Jordan. It has shown a lot of interference from the subjects' mother tongue, Malayalam. This was manifested in the frequent addition of retroflex and aspirated features to some Arabic sounds and sound substitution in the case of uvular and velar Arabic sounds, which were difficult for them to utter. Sometimes, the participants deleted these sounds altogether, or changed their place or manner of articulation to facilitate their pronunciation. In the realm of vowels, the subjects often substituted long for short vowels, and vice-versa; in addition, they replaced the Jordanian vowel /a/ with schwa, the latter being a common sound in their mother tongue.

Recommendations for future studies include investigating the syntactic, morphological and semantic aspects of the Indian workers' speech. It was noticed from the examples given above that the unmarked third person singular imperfect form of the verb was invariably used and the plural markers of JA were absent. It is also recommended to study the effect of gender and length of stay on the speech of Indian workers in Jordan.

The study has obvious limitations since the sample was small and limited to the phonetic level only. A larger sample might have been more accurate regarding the results. Moreover, the study was limited to workers in the northern city of Irbid, and did not cover large numbers of Indian workers

from other language backgrounds in Amman, Aqaba and the Jordan Valley, most of whom work in the agricultural field.

Author Contributions

S.K.K.: field research, introduction, literature review, method, references; Y.F.B.: abstract, findings and discussion.

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Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of Jadars University (protocol code 123, October 15, 2023).

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

All data in this research are available upon demand.

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Conflicts of Interest

The authors declare no conflict of interest.

Appendix A. JA Phonetic Symbols

Arabic Script	Symbol	Discretion
JA Consonants		
أ	ʔ	glottal stop
ب	b	voiced bilabial plosive
ت	t	voiceless alveolar plosive
ث	θ	voiceless dental fricative
ج	d͡ʒ	voiced post-alveolar affricate
ج القاهرية	ʒ	voiced post-alveolar fricative
ح	ħ	voiceless pharyngeal fricative
خ	x	voiceless velar fricative
د	d	voiced alveolar plosive
ذ	ð	voiced dental fricative
ر	r	alveolar trill
ز	z	voiced alveolar fricative
س	s	voiceless alveolar fricative
ش	ʃ	voiceless post-alveolar fricative
تش	ʧ	voiceless post alveolar affricate
ص	sˤ	emphatic voiceless alveolar fricative
ض	dˤ	emphatic voiced alveolar plosive
ط	tˤ	emphatic voiceless alveolar plosive
ظ	ðˤ	emphatic voiced dental fricative
ع	ʕ	voiced pharyngeal fricative
غ	ɣ	voiced velar fricative
ف	f	voiceless labiodental fricative

Arabic Script	Symbol	Discretion
JA Consonants		
ق	q	voiceless uvular plosive
ك	k	voiceless velar plosive
g	g	voiced velar plosive
ل	l	alveolar lateral approximant
م	m	bilabial nasal
ن	n	alveolar nasal
ه	h	voiceless glottal fricative
و	w	labiovelar approximant
ي	j	palatal approximant

Symbol	Discretion
JA Vowels	
i	close front unrounded vowel
i:	long close front unrounded vowel
e	close-mid front unrounded vowel
e:	long close-mid front unrounded vowel
O	open-mid back rounded vowel
O:	long open-mid back rounded vowel
u	close back rounded vowel
u:	long close back rounded vowel
a	open front unrounded vowel
a:	long open front unrounded vowel

IJA phonological extra symbols

Symbol	Discretion
IJA Consonants	
p	bilabial Stop
v	labiodental Fricative
t^h	aspirated Dental Stop
(k^h/g^h)	aspirated Velar Stop
$(ʈ/ ʈ^h/ ɖ)$	retroflex Stop
(ɳ)	retroflex Nasal
ɽ)	retroflex Tap/Trill

Symbol	Discretion
IJA Extra Vowels	
/aj/.	Diphthongs
/ə/.	mid central vowel or the schwa sound

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