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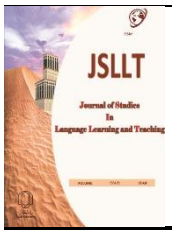

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The Acquisition of Interrogation: A Longitudinal Case Study of a Persian-Speaking Child

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ABSTRACT

Despite a substantial body of research on the acquisition of interrogatives across languages, longitudinal and form–function–integrated evidence from Persian remains scarce, particularly beyond early toddlerhood. This longitudinal study investigates the developmental trajectory of interrogative acquisition in a Persian-speaking child. The data consist of spontaneous speech samples obtained from a 3;9 to 4;10-year-old Persian-speaking girl, totaling approximately 300 hours of naturalistic interactions. The primary aim was to document the systematic emergence of interrogative forms and their associated functions within the Persian language. The findings reveal a clear developmental sequence. Initially, the child acquired the utilization of yes/no questions, characterized by intonational variations, concurrently with the utilization of wh-words such as "*chi*" (what), "*ku/koja*" (where), and "*chera*" (why). This initial phase was succeeded by the gradual assimilation of additional wh-words, including "*ki*" ('who'), "*kodum*" ('which'), "*chandta*" ('how many'), "*cheqadr*" ('how much'), and "*chetor*" ('how'). Notably, the development of semantic functions associated with interrogatives mirrored established research, primarily adhering to two distinct categories: information-seeking functions, conveyed through wh-questions, and non-information-seeking functions, expressed through intonation or yes/no questions. In sum, this study contributes new empirical evidence to our understanding of interrogative acquisition in Persian within a specific age range by illuminating the intricate interplay between linguistic structures and nuanced semantic subtleties.

Keywords: Child language, Development of interrogation, Language processing, Persian language acquisition.

I | INTRODUCTION

Language is our most distinctive and complex human faculty (Chomsky, 1957). Within the rich tapestry of human language, the acquisition of interrogative structures constitutes a fundamental aspect of linguistic development. Questions serve as essential tools through which children explore their environment, seek information, and engage in social interaction. As pointed out by Pinker (2007), the ability to ask questions is a defining feature of human intelligence.

The nature and development of interrogative expressions have long attracted scholarly attention. Consequently, an extensive body of research has been dedicated to the intricate field of linguistic interrogation (Bellugi, 1971; Brown, 1968; Cazden, 1970; Erreich, 1984; Fahn, 2003; Ginzburg, 2010; Klima & Bellugi, 1966; Li et al., 2013; Li et al., 2017; Moradlou et al., 2021; Nguyen & Legendre, 2021; Smith, 1933; Tyack & Ingram, 1977; Vaidyanathan, 1988; Zhou, 2015) with fundamental aspects of language acquisition. These studies have demonstrated that children acquire interrogative forms in systematic developmental stages and employ them for a range of pragmatic purposes, most notably

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information seeking. Cross-linguistic research further suggests that interrogative development reflects an interaction between universal learning mechanisms and language-specific grammatical properties.

Despite this extensive body of research, scholarly attention to the acquisition of interrogatives in Persian remains relatively limited. The existing studies have primarily focused on descriptive analyses of adult interrogative constructions or on the early emergence of individual wh-words in infancy and early toddlerhood. While these studies provide valuable insights, they often rely on cross-sectional designs or short-term observations, limiting their ability to trace developmental trajectories and intra-child variation over time. Moreover, few studies have systematically examined the interaction between interrogative form and communicative function in Persian-speaking children within naturalistic settings.

A further limitation of the existing literature concerns age coverage. Research on Persian interrogative acquisition has predominantly examined children under the age of three, leaving later preschool years rather unexplored. This period is marked by substantial linguistic and cognitive growth, during which children expand their interrogative repertoires and employ questions in increasingly nuanced communicative contexts. A longitudinal perspective during this stage is, therefore, essential for documenting the emergence of more complex interrogative patterns and their functional diversification.

In response to these gaps, the present study adopts a longitudinal case-study approach to examine the development of interrogative forms and functions in a Persian-speaking child between the ages of 3;9 and 4;10. Drawing on a densely collected corpus of spontaneous speech from naturalistic interactions, the study provides a fine-grained account of the sequential emergence of interrogative structures and their pragmatic uses. By integrating formal and functional analyses within a longitudinal framework, this research contributes new empirical evidence to Persian language acquisition and to broader discussions of interrogative development in child language.

Accordingly, the present study addresses the following research questions:

1. What interrogative forms (yes/no questions and wh-questions) emerge in the speech of a Persian-speaking child between the ages of 3;9 and 4;10, and what developmental sequence do they follow?
2. How are different interrogative forms distributed across information-seeking and non-information-seeking functions during this period?
3. How do changes in interrogative form relate to developments in communicative function, reflecting the interaction between structural and pragmatic growth in Persian interrogative acquisition?

II. REVIEW OF THE RELATED LITERATURE

2.1. The acquisition of interrogation

Questions play a central role in human communication, serving as a primary means through which speakers seek information, manage interaction, and explore their environment. Research has shown that the use of questions emerges early in development and constitutes a fundamental component of child language acquisition (Brown, 1968). Beyond their informational function, interrogatives also facilitate social engagement, emotional expression, and cognitive exploration (Hill, 2020).

The developmental trajectory of children's interrogative use has attracted scholarly attention since early descriptive studies by Davis (1932) and Smith (1933). Empirical work has demonstrated that even infants as young as seven months can discriminate between interrogative and declarative prosody (Geffen & Mintz, 2011). During early stages, children's questions are often realized as formulaic expressions such as *"what is this?"* or *"what is that?"*, which are embedded in routine interactions and serve pragmatic functions before exhibiting adult-like syntactic structure (Johnson, 1983).

Smith (1933) conducted a large-scale analysis of spontaneous speech samples taken from 219 children aged 1;6 to 6;0. It revealed that interrogatives constituted approximately 13% of children's total verbal output. Within this category, wh-questions accounted for nearly 40% of all the interrogative utterances. Smith further observed a developmental shift in the distribution of wh-words; the proportion of wh-questions declined with age, decreasing from 49% at age two to 37% by age five. Among younger children, the most frequently produced interrogatives were *what* and *where*, indicating an early preference

for semantically concrete question forms. These findings are consistent with earlier observations by McCarthy (1930), who reported that questions comprised between 7% and 14% of children's speech, as well as with the study by Ingram (1971), which found that interrogatives constituted approximately 19% of total utterances in children aged 2;5 to 3;0. Further supporting this pattern, Tyack and Ingram (1977) underscored the prevalence of *what* and *where* questions relative to other wh-words. Notably, their reported frequencies for *what* (15%) and *where* (12%) closely mirrored the earlier findings of Smith (1933), who reported corresponding frequencies of 15% and 11%, respectively.

Research examining the acquisition of wh-words consistently demonstrates a prevailing pattern, wherein simpler wh-words like "*what*" and "*where*" are typically acquired before more intricate ones such as "*why*" and "*when*." This sequential pattern of acquisition has garnered robust support from a plethora of studies conducted across various languages, including English (Bloom et al., 1982; Smith, 1933; Tyack & Ingram, 1977), German (Forner, 1979), Japanese (Okubo, 1967), and Korean (Clancy, 1989).

With respect to developmental stages, early work by Bellugi (1965), drawing on analyses of the Brown children's corpora, proposed that children's acquisition of interrogatives can be divided into three major stages defined primarily by Mean Length of Utterance (MLU) rather than chronological age. This approach reflects the assumption that linguistic development progresses at different rates across children and that MLU provides a more reliable index of grammatical development than age (see also Bellugi, 1971; Klima & Bellugi, 1966).

Stage One (MLU ≈ 2.0)

In this initial stage, children's utterances are typically short, averaging around two morphemes. Interrogatives are produced both with and without wh-words, and yes/no questions lack subject–auxiliary inversion and auxiliary verbs. Children rely primarily on rising intonation to mark interrogativity, producing forms such as *"No cake?"*, *"Have some?"*, or *"Where mommy?"*. Wh-questions at this stage are largely formulaic, most commonly involving *what* and *where* (e.g., *"What's that?"*). Comprehension of wh-questions is still limited, and responses are often semantically unrelated to the question, as illustrated below:

- Mother: "What did you do?"
- Child: "Head"
- Mother: "What are you doing?"
- Child: "No"

Stage Two (MLU ≈ 2.5)

During this stage, children continue to rely on intonation to form yes/no questions, and auxiliaries are still generally absent. However, wh-questions show greater productivity, with wh-words consistently appearing in clause-initial position, functioning as question introducers. Children also begin to produce forms such as *"Why not?"*. Comprehension improves notably, and children are more likely to provide contextually appropriate responses to wh-questions. For example:

- Mother: "What do you need?"
- Child: "Need some milk"
- Mother: "What do you have?"
- Child: "Have sugar"

Stage Three (MLU ≈ 3.5)

This stage is characterized by the emergence of auxiliary verbs and more complex interrogative structures. Yes/no questions typically exhibit subject–auxiliary inversion, while wh-questions often contain auxiliaries in non-inverted positions. Children generally place auxiliaries correctly, but inversion is largely restricted to yes/no questions. Representative examples include:

- "Does lions walk?"
- "Will you help me?"
- "What I did yesterday?"
- "Why the Christmas tree going?"

These stages illustrate a progression from prosodically marked and formulaic interrogatives to structurally more complex question forms, with development indexed primarily by increases in MLU rather than chronological age alone.

Interrogative expressions serve a wide range of communicative functions in language development, a point emphasized in both early theoretical accounts and later empirical studies. Early classifications distinguished interrogatives used for information seeking from those serving explanatory or interactional purposes (Sully, 1896). Subsequent work further refined these distinctions by identifying multiple functional categories in children's interrogative use, including inquiries about the external world and internal states, requests, imperatives, attention-seeking, confirmations, and repetitions (Holzman, 1972; Sachs & Devin, 1976; Smith, 1933). Building on this tradition, Vaidyanathan (1988) performed a longitudinal study of Tamil-speaking children and proposed a broader functional dichotomy between information-seeking and non-information-seeking interrogatives, a distinction that has since been widely adopted in research on question acquisition. Chouinard (2007) further elaborated this framework by distinguishing requests for information, requests for action, and non-information-seeking uses, arguing that children rely on an Information Requesting Mechanism (IRM) to actively acquire knowledge from their environment. Empirical evidence from typologically diverse languages supports this account: studies of Cantonese-speaking children show that wh-questions are predominantly used for information seeking, while yes/no questions more often serve action-oriented and interactional functions (Li et al., 2013), whereas corpus-based research on Mandarin-speaking children indicates an even stronger bias toward information-seeking interrogatives, with wh-questions constituting the majority of such uses (Li et al., 2017). Taken together, these findings suggest that, while children exploit interrogatives for a variety of pragmatic purposes, information seeking constitutes a core and potentially universal function in early interrogative development.

Recent theoretical and experimental work has refined these accounts by highlighting the role of pragmatics, frequency, and input–intake distinctions in interrogative acquisition. Nguyen and Legendre (2021) demonstrate that children distinguish between pragmatic subtypes of wh-questions, such as echo and information-seeking questions, and selectively regularize dominant patterns in production rather than internalizing all attested variants simultaneously. Complementing this perspective, Šimík (2023) proposes a hierarchical model of wh-constructions in which simple interrogatives constitute the most basic and developmentally primary wh-structure, acquired prior to more complex wh-related constructions. Together, these findings underscore the need for analyses that integrate syntactic, pragmatic, and distributional factors in accounts of interrogative development.

The complex interaction among the structural properties and communicative functions of interrogatives has led scholars to emphasize the need for detailed, language-specific investigation. While cross-linguistic research has identified broad developmental patterns in the acquisition of interrogatives, the ways in which these patterns are realized depend on the grammatical and pragmatic properties of individual languages. This underscores the central role of interrogatives in child language development and motivates focused examination of their acquisition within specific linguistic systems, including Persian.

2.2. Interrogatives in Persian

As classified by Greenberg (1963), Persian seems to fit into the category of a type III language that typically exhibits a verb-final arrangement. Forouqy (1944) suggests a specific word order for Persian: Subject - Attributive - Direct Object - Indirect Object - Verb. Furthermore, Dabir Moghaddam (1982) and Karimi (2005) assert that, in Modern Persian, the typical word order is Subject-Object-Verb (SOV). Interrogatives, or question words, are a fundamental aspect of any language, and in the Persian language, there are different ways to form questions, including yes/no questions and wh-questions. Intonation plays a crucial role in conveying the intended meaning of a question in spoken Persian. Rising intonation is often used to indicate a question, even if the word order remains the same as in a statement. According to Samadi (1997), changing the intonation of affirmative sentences is the only way to create Yes/No Questions. For making Wh-Questions, the change of intonation is required along with the use of Wh-words. Wh-words in Persian include, among others, *che* 'what', *ki* 'who', *koja/ku* 'where', *chera* 'why', *chetor/chejuri/chegune* 'how', *chand/chandta* 'how many', *cheqadr* 'how much', and *key* 'when'. They are also called K-words because they start with *ch* or *k*. For example:

(1) Chekar mikoni?

what-work PROG-do.2SG
What are you doing?

(2) *Ki emruz amad?*
who today come.PST.3SG
Who came today?

(3) *Chera inja nisti?*
why here NEG-be.2SG
Why aren't you here?

(4) *Koja zendegi mikoni?*
where living PROG-do.2SG
Where do you live?

The positioning of wh-words in Persian has been discussed extensively in descriptive and theoretical work. Natel Khanlari (2012) notes that certain interrogative particles, such as *aya*, appear sentence-initially to mark yes/no questions, while other wh-words replace the syntactic position of the constituent being questioned.

Gholamhossein-zadeh (2012) has elaborated on the movement of question words in the Persian language with further explanation. He states that the placement of question words in a sentence is determined based on the position of the element being inquired about. Accordingly, "*aya*" and "*chera*", as they inquire about the entire sentence, appear at the beginning of the sentence. "*magar*", often used for negative inquiries, usually comes at the beginning of the sentence. Moreover, when question words inquire about specific constituents of a sentence, they are positioned in the same place as that constituent within the sentence.

Qarib et al. (2013) refer to question words as question particles and enumerate them as follows: "*ke*" for persons, "*che*" for things, "*ku* and *koja*" for location, "*kodam* and *kodamin*" for doubt, "*chon*" for manner, "*chand*" for quantity and time, "*key*" for time, and "*magar* and *hich*" for denial. The question word "*chon*" has an ancient usage, and nowadays, "*chetor* and *chegune*" are used instead of it.

Bateni (2013) has categorized question words based on their intonation into two groups: the first group includes question words (*aya*, *magar*, and *hich*) that are pronounced with a rising intonation. The rest of the question words are placed in the second group. These question words can be pronounced with either a rising or falling intonation. Apart from the intonation, in the examples provided by Bateni, the question words from the first group are placed at the beginning of the sentence.

(1) *Aya* khodet nagofti?
Q self-2SG NEG-say.PST-2SG
Didn't you say it yourself?

(2) *Magar* khodet nagofti?
Q/PRT self-2SG NEG-say.PST-2SG
Didn't you say it yourself? / But didn't you say it?

Bateni's perspective regarding the second group is that question words can be positioned at the beginning of the sentence or elsewhere in the sentence, such as:

(3) *Chera* miravad?
why PROG-go-3SG
Why is he/she going?

(4) Miravad *chera*?
PROG-go-3SG why
Why is he/she going?

Empirical studies on Persian first language acquisition, though limited in number, reveal a developmental trajectory broadly consistent with cross-linguistic patterns. Jalilevand and Ebrahimipour (2010), in a longitudinal study of two Persian-speaking children aged 12–36 months, found that interrogativity initially emerged through rising intonation and non-lexical vocalizations (including fillers such as /m/ or /hum/), prior to the production of conventional wh-forms. The first lexical wh-items to emerge were *chi* 'what' and *ku*/*koja* 'where', while more semantically and cognitively demanding forms such as *chera* 'why', *chejuri* 'how',

and *kodum* 'which' appeared later; notably, "*when*" did not occur in the children's spontaneous speech up to 36 months.

In another study, Taghinezhad et al. (2017) investigated the sequence of acquisition of Persian interrogative words among Persian-speaking children. It was observed that, initially, children employed rising intonation before deploying specific interrogative words. Subsequently, at the age range of 17 to 24 months, children began to employ interrogative words "*chi*" (what) and "*ku*" (where) as their initial interrogative expressions, probably due to their immediate environmental associations. The emergence of new interrogative words occurred at approximately 24 to 30 months of age, including "*chera*" (why), "*koja*" (where), and "*ki*" (who). From the age of 31 to 36 months, children incorporated "*kodum*" (which) and "*chejuri*" (how) into their linguistic repertoire. Finally, interrogative terms such as "*cheqadr*" (how much), "*chetor*" (how), and "*chandta*" (how many) became evident in their utterances. Interestingly, the interrogative word "*key*" (when) did not appear in their linguistic expressions until the age of 35 months.

Recent work by Shiamizadeh et al. (2018) provides psycholinguistic evidence that Persian wh-in-situ questions are identifiable from the earliest portions of the utterance based on prosodic cues alone. Their findings suggest that prosody plays an anticipatory role in interrogative comprehension, reinforcing the importance of intonation in Persian question formation. Building on this typological profile, Taghizadeh and Baniasad-Azad (2023) offer a recent longitudinal, cross-linguistic comparison of Persian- and English-speaking children, demonstrating that Persian-speaking children may produce adult-like wh-structures earlier, despite variability in wh-fronting and in-situ patterns. Their findings highlight the role of language-specific grammatical constraints and challenge simplified assumptions about Persian interrogative structure.

Although the existing research provides important insights into the development of interrogatives, a clear gap remains in the literature on Persian. In particular, despite the growing number of cross-linguistic studies on interrogative acquisition, relatively little is known about the longitudinal development of interrogative stages in Persian beyond early toddlerhood. Moreover, few studies have examined how interrogative form and communicative function develop in tandem within naturalistic interaction. This gap highlights the need for longitudinal, child-centered investigations of interrogative acquisition in Persian.

III. AIM OF THE STUDY

The present study aimed to provide a systematic longitudinal account of the acquisition of interrogatives in Persian as a first language. Given the limited empirical research on Persian interrogative development beyond early childhood, this study documents how a Persian-speaking child gradually acquires different interrogative forms and functions over time. Using a longitudinal case-study design based on a densely collected corpus of spontaneous speech, the study examines the structural patterns, functional uses, and sequential milestones that characterize the child's evolving interrogative system. The overarching aim is to contribute to a more comprehensive understanding of interrogative development in Persian and to inform broader discussions of form-function interaction in child language acquisition.

IV. METHODOLOGY

4.1. Participant

The dataset utilized in this research was meticulously assembled from a longitudinal corpus of spontaneous speech produced by a Persian-speaking child named Mary[1], who exhibited no reported psychological, physical, or linguistic impairments. The data were collected over a 13-month period, from age 3;9 to 4;10, with the recording sessions conducted on alternating days. This procedure resulted in the collection of over 200 audio files.

The amassed dataset comprised audio recordings capturing the dynamic interplay between Mary and an adult interlocutor—primarily one of the researchers and, in some cases, a parent—within the context of

[1] . A pseudo name was chosen to preserve the anonymity of the participant

routine activities such as storytelling and playful interactions involving toys. All the sessions were conducted in Mary's natural home environment, maintaining ecological validity, with an average duration of approximately 90 minutes per session. As the audio recordings were completed, the observational notes were kept to document the relevant interactional and contextual information.

Mary lived in Neyshabur, Iran, and was the only child in her family at the time of data collection. Prior to the commencement of the study, informed verbal consent was obtained from the child's parents for participation, audio recording, and the use of the data for research purposes. The study was conducted in accordance with the established ethical guidelines for research involving human participants, ensuring the anonymity and confidentiality of all the data.

4.2. Transcription

The transcription process for this study was conducted within the CHILDES (Child Language Data Exchange System) framework (MacWhinney, 2000). By utilizing this global standard, the current research aligns its exploration of Persian interrogatives with the established methodologies used in the CHILDES corpus. This ensures that the developmental data reported here are compatible with international cross-linguistic databases and contribute to the broader understanding of Persian child language as represented in the CHILDES system.

The speech data were initially transcribed by one of the researchers using the CLAN (Computerized Language ANalysis) software. To ensure systematic organization, a dedicated file was assigned for transcription completion at the end of each month, maintaining a consistent thirty-day interval. Adhering to the rigorous guidelines established within the CHAT (Codes for the Human Analysis of Transcripts) format (MacWhinney, 2000), a verbatim transcription approach was meticulously applied to the extensive dataset. This comprehensive effort entailed transcribing the contextual content, encompassing over 10,000 lines of spoken expressions. It is worth noting that a significant portion of this compilation consisted of the child participant's contributions.

By adopting the standardized CHAT format, the study utilized a rigorous system of speaker tiers and punctuation markers to accurately represent the child's speech and the surrounding interactional context. This coding system is globally recognized for its precision in capturing various levels of linguistic and discourse-level detail, ensuring that features such as pauses, unintelligible segments, and overlapping speech are consistently documented.

To maintain the transcription reliability, all the transcripts were independently reviewed by a second researcher experienced in child language transcription and familiar with the CHAT format. This reviewer examined the transcripts for accuracy in segmentation, lexical representation, and consistency with CHAT conventions. Any discrepancies or ambiguities identified during the review process were discussed and resolved through consensus between the two researchers. This iterative verification procedure enhanced the accuracy and reliability of the final transcribed corpus used for analysis.

4.3. Procedure

An extensive search was conducted within the corpus to identify all utterances containing instances of interrogatives, using the KWAL program within the CLAN software. Following standard CHAT conventions (MacWhinney, 2000), a question mark (?) was used to tag all types of interrogatives, including both wh-questions and intonation questions. To extract these instances from the child's speech samples, the command "kwal +s"?" -w2 +w2 +t*CHI fas.cha" was executed. The output included a contextual window of four conversational turns, two preceding and two following the target utterance. This augmentation allowed the researchers to establish the necessary interactional backdrop to distinguish between wh-questions and intonation-only questions, as well as to assess subtle semantic nuances. An example of such an extracted sequence is provided below:

*** File "fas.cha": line 155. Keyword: ?
*CHI: chikar kardi?
what-work do-PAST.2SG
what did you do?
*INV: chi?
what

what?
*CHI: chikar kardi ru muhat?
what-work do-PAST.2SG on hair-PL.2SG.POSS
what did you do to your hair?
*INV: muham hich kari nakardam .
hair-PL.1SG.POSS no work-IND NEG-do-PAST.1SG
I didn't do anything to my hair.
*CHI: na intori!
no this-way
no, like this!

Following the initial extraction, the first researcher manually distinguished and categorized the intonation questions versus wh-questions. To ensure the reliability and consistency of this classification, a second researcher independently reviewed the tabulated data.

To determine the emergence of new interrogative functions, clear operational criteria were applied. A function was considered to have emerged when the child produced an interrogative form expressing a communicative function not previously observed in her speech. To ensure reliability, the function had to occur in at least two distinct contexts, either within a single recording session or across two consecutive sessions. The first session in which these criteria were met was identified as the point of emergence for that function. In addition, the child's non-linguistic behavior and the surrounding interactional context were taken into account to support functional interpretation. These criteria formed the basis for the functional classification of interrogative utterances. Subsequent to data extraction, a quantitative evaluation was undertaken, wherein the frequency and recurrence of each utilized interrogative were systematically calculated. This quantitative analysis was intended to deepen our understanding of the developmental progression related to interrogation. In addition to the aforementioned analyses, MLU was calculated as a general indicator of the child's overall language development, and it was of consideration during the analysis.

V. RESULTS

5.1. Background measures and MLU development

As a general index of linguistic development, MLU was calculated across the recording period. The child's MLU ranged from 2.43 to 3.14 over the course of the study; while this trend indicates gradual growth in morphosyntactic complexity, the data exhibited several intermittent shifts. Such fluctuations are typical of longitudinal language acquisition data and reflect the inherent variability of MLU, which is often influenced by factors such as shifts in discourse context (e.g., transitions between conversational and narrative tasks), the child's individual developmental trajectory, affective factors during certain sessions, and sampling variability within specific recording sessions. These fluctuations serve as a reminder that MLU is best viewed as one component of a broader assessment of language maturity rather than a singular measure of proficiency. The background information and MLU values obtained in this study are presented in Table 1, and the developmental trend is illustrated in Figure 1.

Table 1. Background information and MLU

Name	Sex	Age Range	MLU Range	Language	Sibling
Mary	Female	3;9 – 4;10	2.43 – 3.14	Persian	-

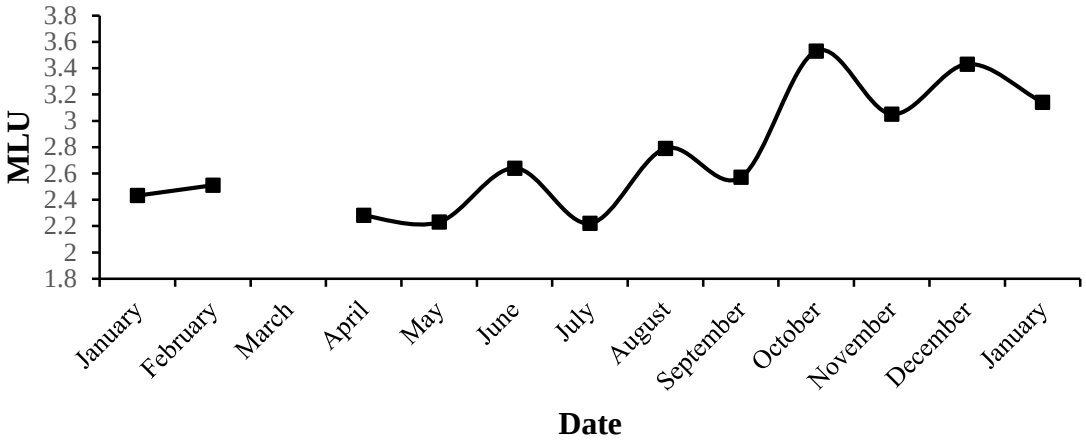

Figure 1. Mean length of utterance

5.2. Interrogative forms in Mary's speech

An analysis of Mary's speech samples collected from the age of 3;9 to 4;10 revealed a systematic development of interrogative forms over time. Interrogatives accounted for 9.97% of the child's total utterances. Within this set, yes/no questions constituted 33.33% of all the interrogatives. Among wh-questions, *chi* ('what') was the most frequent (38.86%), followed by *ku/koja* ('where'; 9.50%) and *chera* ('why'; 6.74%). The other interrogative forms, including *ki* ('who'), *kodum* ('which'), *chetori* ('how'), *chandta* ('how many'), and *cheqadr* ('how much'), each occurred with frequencies below 4%. No instances of temporal interrogatives ('when') were observed during the study period. The corresponding detailed frequency distributions and ages at the first use are presented in Table 2.

Table 2. Frequency, percentage, and age at the first use

Interrogative forms	Age	Mary
Yes/No Qs	3;9	193 (33.33%)
Chi	3;9	225 (38.86%)
Ku/Koja	3;9	55 (9.50%)
Chera	3;9	39 (6.74%)
Ki	4	9 (1.55%)
Cheqadr	4;2	21 (3.63%)
Kodum	4;2	7 (1.21%)
Chetor	4;4	15 (2.59%)
Chandta	4;7	15 (2.59%)
Total utterances		5807
Total interrogatives		579
% of interrogatives		9.97%

Based on the emergence and distribution of interrogative forms, two developmental stages were identified. Stage 1 was characterized by the use of intonation-based yes/no questions and the emergence of early wh-forms, including *chi* ('what'), *ku/koja* ('where'), and *chera* ('why'). Examples from this stage include:

*CHI: baba?
dad
dad?
*CHI: ba gushi?
with phone
with the phone?
*CHI: in chiye?
this what-COP.3SG
what is this?

*CHI: baba dari koja miri?
dad have-2SG where PROG-go.2SG
dad, where are you going?
*CHI: chera in mikanish?
why this PROG-do-2SG-3SG.OBJ
why are you disconnecting it?

Stage 2 involved the continued use of intonation-based yes/no questions, including negative forms, along with the emergence of additional wh-words such as *ki* ('who'), *kodum* ('which'), *chetori* ('how'), *chandta* ('how many'), and *cheqadr* ('how much'). It should be noted that *cheqadr* did not occur in interrogative constructions but appeared only in exclamatory (declarative) contexts. Examples from this stage include:

*CHI: Mary kiye?
Mary who-COP.3SG
who's Mary?
*CHI: kodum dust dari?
which like have-2SG
which one do you like?
*CHI: chetori kardi?
how do.PST-2SG
how did you do it?

The developmental progression of interrogative forms across stages is illustrated in Figure 2.

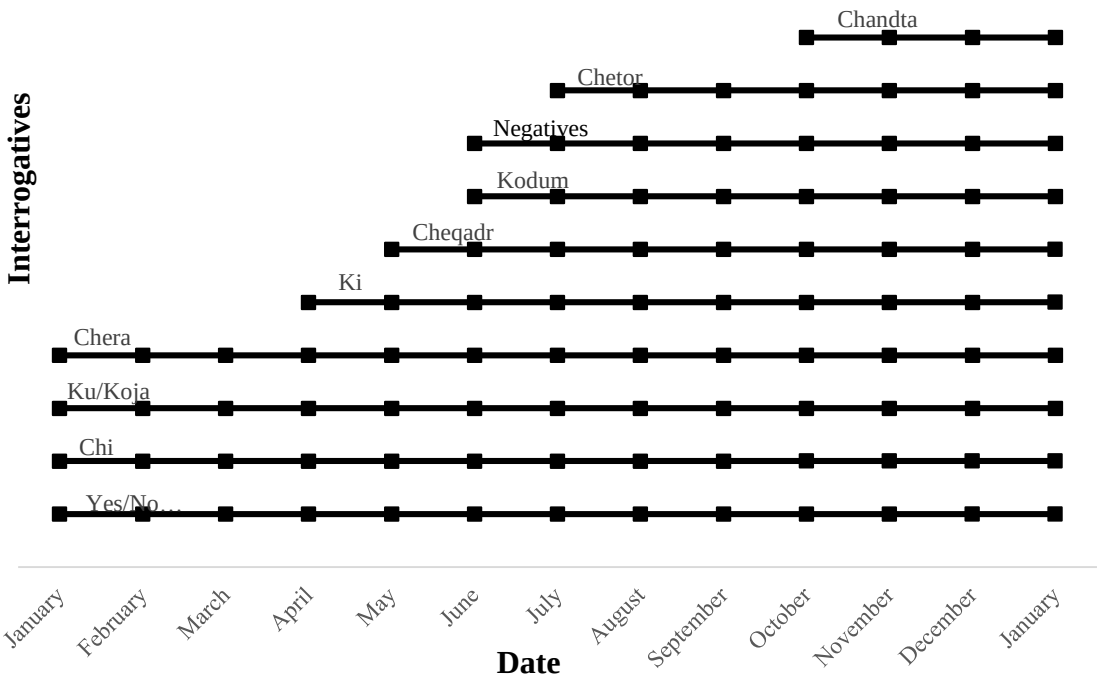

Figure 2. The process of development of interrogative forms over time

5.3. Functions of interrogatives in Mary's speech

Figure 3 presents a comprehensive taxonomy outlining the range of functions fulfilled by interrogative forms in Mary's linguistic productions under analysis. In contrast to interrogatives typically used in parental speech, those occurring in children's discourse are predominantly employed as mechanisms for

information seeking. Nevertheless, interrogatives in children's speech are not restricted exclusively to this function; they also extend to non–information-seeking uses.

A closer examination of different question types and their associated pragmatic functions reveals that yes/no questions constitute the only interrogative form that displays functional versatility across multiple pragmatic contexts. By contrast, wh-question forms such as *chi* (what), *koja/ku* (where), *ki* (who), *kodum* (which), *chera* (why), *chetori* (how), and *chandta* (how many) are used primarily to elicit information. This detailed analysis of interrogative usage in children's linguistic interactions offers valuable insight into the complex and evolving roles of these forms within the course of language development.

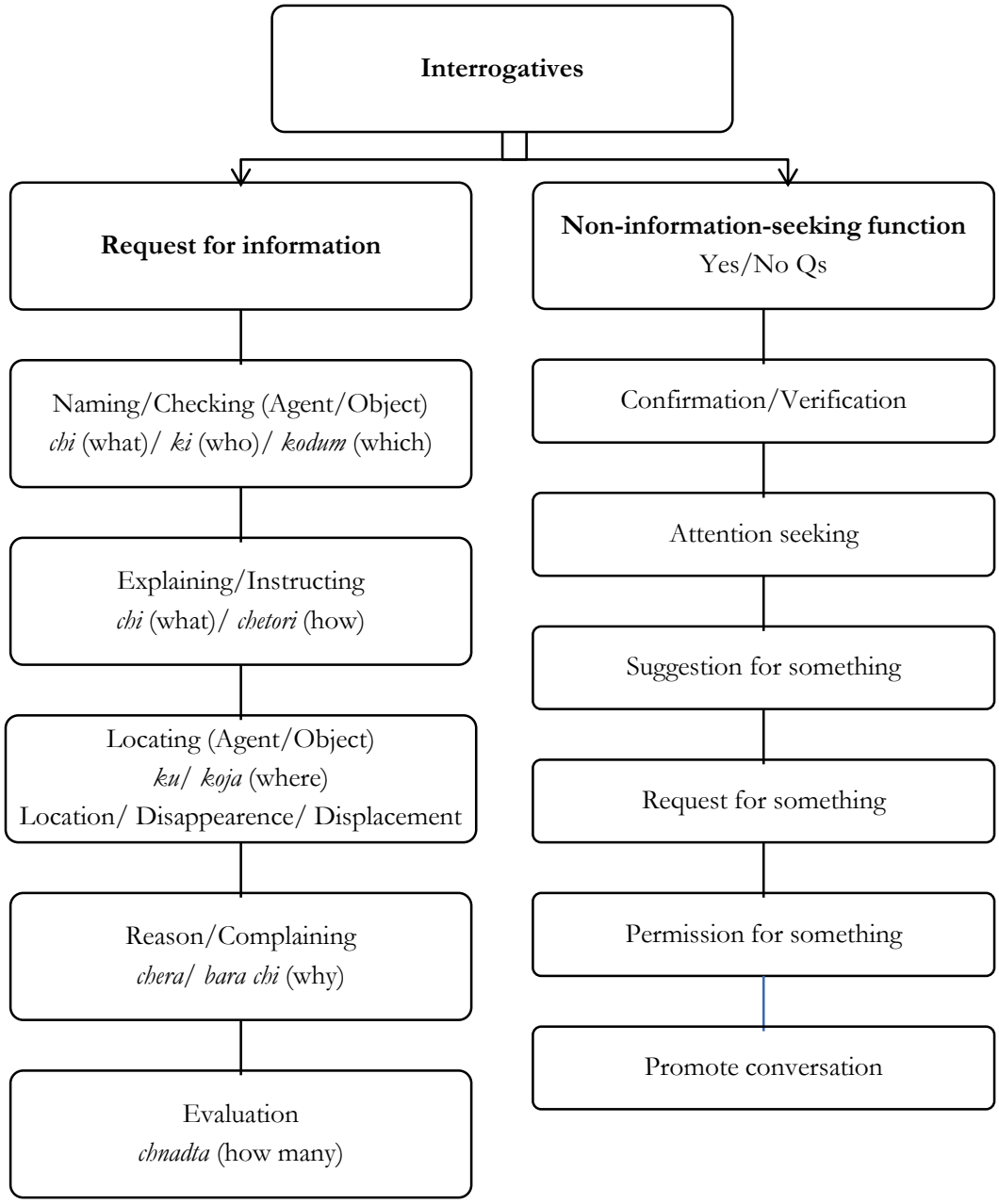

Figure 3. Interrogative functions in Persian

5.3.1 Request for information

As noted by Vaidyanathan (1988), children's employment of interrogatives is primarily oriented toward eliciting information from caregivers, particularly with respect to object identification and spatial location. Since language acquisition unfolds within a social context, children's questions are intrinsically tied to

understanding the physical properties of their immediate environment while simultaneously engaging in social interaction. In the early stages of language development, children's inquiries predominantly focus on identifying the names and locations of agents or objects. These communicative aims are typically realized through the use of specific intonational patterns in conjunction with question words such as *chi* (what) and *koja/ku* (where).

Notably, Mary's use of *chi* (what) questions extends beyond simple requests for object labels to include purpose-oriented or rational inquiries, as evidenced by expressions such as *bara chi* (for what). This pattern highlights the emerging complexity and flexibility of children's questioning strategies. As children's linguistic competence develops further, their interrogatives increasingly target agentive dimensions, including needs, desires, reasons, and intentions. This shift is reflected in the growing use of forms such as *ki* (who), *kodum* (which), *chera* (why), *chetori* (how), and *chandta* (how many). The examples presented below illustrate this developmental progression in interrogative use, underscoring the multifaceted and dynamic nature of children's language development.

Naming/Checking (Agent/Object)

Chi (What): Used to inquire about the nature or identity of an object, action, or concept. It seeks information about the name or category of something. For example:

*CHI: in chiye?
this what-COP.3SG
what is this?

Ki (Who): Used to ask about the identity of a person or group responsible for an action or subject of discussion. It seeks information about a person's identity or even the format of possessives. For example:

*CHI: in kiye?
this who-COP.3SG
who is this?

Or

*CHI: gushiye kiye?
phone-EZ who-COP.3SG
whose phone is this?

Kodum (Which): Used to select or inquire about a specific item or option from a group of choices. It seeks information about a specific selection among options, or sometimes to figure out their names. For example:

*CHI: kodum dust dari?
which like have-2SG
which one do you like?

Or

*CHI: kodum hafteshe?
which seven-COP-3SG
which one is the seven?

Explaining/Instructing

Chi (What): In this context, "*chi*" can also be used to ask for an explanation or definition of something. For instance:

*CHI: chi shod?
what happen.PST.3SG
what happened?

Or

*CHI: chikar kardi?
what-work do.PST-2SG
what did you do?

Chetori (How): Used to ask about the method, manner, or way something is done. It seeks information about the process or steps involved. For example:

*CHI: chetori kardi?
how do.PST-2SG
how did you do it?
Or
*CHI: chetori beram bala?
how SUBJ-go-1SG up
how do I go up?

Locating: (Agent/Object)

Ku/Koja (Where): Used to ask about the location of a person, object, or event. It seeks information about the location of an agent or object, its disappearance, or the displacement. For example:

*CHI: kojas?
where-COP.3SG
where is it?
Or
*CHI: Mamadhossein koja raft?
Mamadhossein where go.PST.3SG
where did Mohammadhossein go?

Reason/Complaining

Chera (Why): Used to ask for the reason behind an action, situation, or event. It seeks an explanation for the cause or motive, and even sometimes as a function of complaining about something. For example:

*CHI: in chera intori miyofte?
this why this-like PROG-fall-3SG
why is it falling down like this?
Or
*CHI: chera gomesh kardi: [=! shouting]?
why lost-3SG.OBJ do.PST-2SG
why did you lose it?

Evaluation

Chandta (How Many): Used to ask about the quantity or number of something. It seeks a numerical answer. For example:

*CHI: chanta doros mikone?
how.many-CL make PROG-do-3SG
how many is he/she making?

5.3.2 Non-information-seeking function (Yes/No questions)

When adults utilize interrogative structures such as "*where is this/that*?" or "*who is this/that?"*, their underlying motive extends beyond a mere quest for information. Rather, these interrogatives function as strategic tools for garnering the attention of children and for initiating and perpetuating interaction with them. Intriguingly, a parallel behavior is evident in the usage of interrogatives by children. These linguistic devices not only cater to information-seeking purposes but also encompass broader functions (Vaidyanathan, 1988). The subsequent examples illustrate instances of Mary's speech that pertain to non-information-seeking functions:

Confirmation/Verification

*CHI: inja park?
here park
is this park?
*CHI: otaq?
room
room?

Attention Seeking

*CHI: didi?
see.PST-2SG
did you see?
*CHI: negah, intori kardi ?

look this-like do.PST-2SG
look, did you do this?

Suggestion for Something

*CHI: rafti kelas khabet miyad ?
go.PST-2SG class sleep-2SG PROG-come.3SG
you went to the class and are you sleepy now? (suggesting that her parent should go to sleep after class)

*CHI: dus dari bazi koni?
like have-2SG play do-SUBJ.2SG
do you wanna play?

Request for Something

*CHI: mishe ye dune shalbaramo [:: shalvaramo][*] doros koni?
PROG-become one CL pants-1SG-OBJ correct do-SUBJ.2SG
will you fix my pants?

Permission for Something

*CHI: mizari danlod konam?
PROG-let-2SG download do-SUBJ.1SG
would you let me download?

Promote Conversation

*CHI: mozeto khordi ?
banana-2SG-OBJ eat.PST-2SG
did you eat your banana?

Table 3 delineates the progression of forms and functions of interrogation in Persian throughout their developmental stages of acquisition. It is important to note that the studied child exhibited varying degrees of engagement with different functions. So, certain utterances could be categorized within more than a single semantic classification.

VI. DISCUSSION

The present study set out to investigate the developmental trajectory of interrogative acquisition in Persian by examining both the formal properties and functional uses of questions in the spontaneous speech of a Persian-speaking child over a longitudinal period. Specifically, the study aimed to identify the sequence of interrogative forms, determine their associated pragmatic functions, and explore the relationship between form and function during development.

The findings reveal a clear and systematic developmental pattern. Interrogatives constituted a substantial portion of the child's speech, with yes/no questions and wh-questions emerging early and expanding gradually over time. Two major developmental stages were identified. In the first stage, the child relied primarily on intonation-based yes/no questions alongside early-emerging wh-forms such as *chi* ('what'), *ku/koja* ('where'), and *chera* ('why'). The second stage was characterized by the emergence of additional wh-words, including *ki* ('who'), *kodum* ('which'), *chetori* ('how'), *chandta* ('how many'), and *cheqadr* ('how much'), reflecting increasing syntactic and semantic complexity. These results indicate that Persian-speaking children follow a structured and incremental path in interrogative development, consistent with cross-linguistic findings on early question acquisition.

The early prominence of intonation-based yes/no questions aligns with previous research on Persian (Samadi, 1997; Taghinezhad et al., 2017). Similarly, the early emergence of *chi* ('what') and *ku/koja* ('where') is consistent with earlier studies suggesting that object identification and spatial reference constitute foundational communicative needs in early child language (Bloom et al., 1982; Forner, 1979; Smith, 1933; Taghinezhad et al., 2017; Tyack & Ingram, 1977). The appearance of *chera* ('why') at an early stage further suggests that causal reasoning begins to surface earlier than traditionally assumed in some accounts of question development.

While the overall developmental trajectory observed in this study aligns with the existing literature on interrogative acquisition, the identification of two broad developmental stages differs from the three-stage model proposed for English by Bellugi (1965). This difference can be explained by typological and acquisition-related factors.

Table 3: Development of forms and functions of interrogation in Persian

			Request for information					Non-information-seeking function				
	Age	MLU	Naming/ Checking	Explaining/ Instructing	Locating	Reason/ Complaint	Evaluate	Confirmation/ Verification	Attention seeking	Suggestion	Permission	Request	Promoting conversation
Persian													
Stage 1													
	3;9	2.43	Chi		Ku/Koja	Chera		*		*			
Stage 2													
	4	2.28	Ki						*				
	4;2	2.64	Kodum								*	*	
	4;4	2.22		Chetor									
	4;7	3.53					Chandta						*

Cross-linguistic research suggests that the typological properties of wh-systems influence acquisition trajectories, such that languages requiring multiple obligatory syntactic operations for wh-question formation, including auxiliary movement and inversion, tend to elicit more persistent syntactic errors in child speech. In contrast, languages with fewer movement requirements and greater word-order flexibility may allow children to produce adult-like wh-questions earlier in development (Taghizadeh & Baniasad-Azad, 2023). From this perspective, the two-stage pattern identified in the present study reflects cross-linguistic differences in how interrogativity is encoded. These findings position Persian as a particularly informative testing ground for theories of interrogative acquisition that emphasize the interaction of prosody, syntax, and discourse in development. Additionally, it is worth noting that the time interval covered in this study was relatively limited, which may have influenced the granularity of stage identification. Longer longitudinal observation periods could potentially reveal more nuanced transitional phases between developmental stages, particularly in languages with flexible word order where the boundaries between stages may be less distinct than in languages with rigid syntactic requirements. This limitation, while common in early-childhood language acquisition research, should be considered when comparing developmental patterns across studies and languages.

Beyond form, the study provides important insights into the functional development of interrogatives in Persian. The child's questions serve two primary functions: information-seeking and non-information-seeking. Wh-questions were predominantly used to request information, whereas yes/no questions displayed greater functional flexibility, including confirmation, attention-seeking, requests, and conversational maintenance. This functional asymmetry closely parallels findings reported for Tamil (Vaidyanathan, 1988), Cantonese (Li et al., 2013), Mandarin (Li et al., 2017), and English (Chouinard, 2007), supporting the view that request-for-information functions constitute a core and possibly universal motivation for early question use.

From a quantitative perspective, the child produced wh-questions more frequently than yes/no questions, a pattern consistent with observations that children increasingly rely on linguistically explicit forms to access information as their cognitive and linguistic capacities expand. This shift reflects a broader developmental transition from context-dependent, prosody-driven communication to more lexically and semantically specified interrogative strategies.

The unique pattern in Mary's acquisition can be partially attributed to the central role of context in language development. A substantial body of research highlights the role of discourse context, caregiver input, and social interaction in shaping language acquisition (Clark, 1976; Dale & Duran, 2011; Nieuwland & Kuperberg, 2008; Nordmeyer & Frank, 2014b). Persian-speaking children are exposed to a distinctive linguistic and social environment that may privilege certain interrogative functions over others. They are embedded in communicative contexts where questions are frequently used not only to elicit information but also to manage interaction, guide behavior, and negotiate social roles. The social environment, including interactions with caregivers, peers, and the broader community, provides specific linguistic input and pragmatic cues that shape the development of interrogation functions. Parental speech, in particular, often employs interrogatives to direct attention and regulate action (Gleason & Weintraub, 1978), and children may model these pragmatic uses in their own speech (de Villiers & de Villiers, 1979). Such patterned input probably contributes to the early functional diversification of yes/no questions observed in the present study.

It is noteworthy to acknowledge that, despite conscientious efforts to uphold consistent communication with the participant and mitigate potential errors, this study has several limitations. The foremost is the temporal hiatus observed at the inception of the data collection. The commencement coincided with the occurrence of Nowruz, the official Persian New Year holidays, coupled with the participant's travel commitments, resulting in an approximately one-month period wherein the researchers were precluded from accessing the child, consequently impeding the collection of any pertinent samples during this timeframe.

The second limitation lies in the single-participant design, which involved a 3;9-year-old Persian-speaking child. While including younger children would have offered insights into earlier acquisition stages, participant availability restricted the study to this age range. However, this age range presents a

unique opportunity. Compared to toddlers, children within this bracket exhibit a wider and more diverse repertoire of interrogation forms and functions. This increased linguistic complexity facilitates a nuanced analysis of children's interrogation use in Persian, providing a more detailed and clearer picture of their interrogative system at this specific developmental stage. Consequently, this approach contributes to a deeper understanding of the intricate dynamics of language acquisition.

Finally, the findings highlight a close relationship between the development of interrogative forms and their pragmatic functions. The parallel progression of form and function suggests a reciprocal interaction between structural knowledge and communicative intent, underscoring the multifaceted nature of interrogative acquisition. Together, these results contribute to a more nuanced understanding of how Persian-speaking children develop the ability to ask questions and how typological, pragmatic, and interactional factors jointly shape this process.

VII. CONCLUSION AND IMPLICATIONS

The present study examined the development of interrogative forms and functions in Persian through a longitudinal analysis of spontaneous speech produced by a Persian-speaking child from the age of 3;9 to 4;10. By integrating formal and functional analyses within a single framework, the study aimed to clarify how interrogative systems emerge and develop during this period.

The primary theoretical contribution of this study lies in demonstrating that the acquisition of interrogative forms and their communicative functions proceeds in a coordinated and parallel manner. Rather than developing independently, changes in interrogative structure were closely aligned with shifts in pragmatic use. The findings show that Persian-speaking children initially rely on intonation-based questions and a limited set of early wh-forms, and they subsequently expand their interrogative repertoire to include a wider range of wh-questions associated with more specialized communicative functions. This form–function alignment provides empirical support for models of child language acquisition that emphasize the interaction between structural development and communicative intent.

From a broader perspective, the study contributes to cross-linguistic discussions of interrogative acquisition by providing longitudinal evidence from Persian, a language that differs typologically from English in how interrogativity is encoded. The identification of two broad developmental stages suggests that the organization of interrogative development reflects language-specific encoding strategies and acquisition pressures, rather than deviations from general developmental principles. By extending the empirical base beyond well-studied Indo-European languages, the findings highlight the importance of incorporating typologically diverse languages into theories of question acquisition.

The results also have practical implications for language assessment and intervention in Persian-speaking contexts. For instance, speech-language therapists working with preschool-aged children can use the observed relationship between interrogative form and function as a developmental reference. A child who produces wh-forms but uses them primarily for limited pragmatic purposes, or who continues to rely exclusively on intonation-based questions beyond the expected developmental period, may benefit from intervention strategies that target functional expansion rather than structural form alone. Similarly, educators and caregivers can support interrogative development by actively engaging with children's information-seeking questions and modeling a variety of wh-question forms in everyday interactions, such as during shared reading, play, or problem-solving activities.

Although this study provides a detailed account of interrogative development within a specific age range, its findings are necessarily constrained by the single-participant design and the absence of earlier developmental data. Future research would benefit from larger and more diverse samples, earlier longitudinal observation, and closer examination of caregiver input and interactional context. Such efforts would further refine our understanding of interrogative development and strengthen the theoretical and applied implications of research on child language acquisition. The possibility of helping to facilitate the way children acquire a language remains an exciting and worthwhile proposition for future research.

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