Testing the interface hypothesis: the acquisition of English indirect questions by L1 speakers of Omani Arabic

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Abstract

This study tests the interface hypothesis by investigating how advanced Arab learners of English develop the grammatical knowledge of English indirect questions. Ten advanced Arab learners of English and four native speakers of English are tested on a written grammaticality judgment task and an oral production task. Three hypotheses are tested: (1) the grammatical knowledge of advanced Arab learners of English indirect questions is different from that of native speakers of English, (2) advanced Arab learners of English do not have problems acquiring indirect questions, where the matrix clause is a non-interrogative clause and the embedded clause is an interrogative clause, (3) advanced Arab learners of English have problems acquiring indirect questions, where both the matrix clause and the embedded clause are interrogative. The results of the study confirm the first and third hypotheses but disconfirm the second hypothesis. The results of the study provide counter evidence to the interface hypothesis, as even linguistic properties that do not involve interface between syntax and discourse/pragmatics seem to be persistently problematic at the advanced level of L2 proficiency.

1. Introduction

In the literature on second language (L2) acquisition, a long-standing tradition has been the view that while L2 learners do not have problems in acquiring the L2 semantic properties (Slabakova, 2003), they do face a problem in the area of L2 grammar in that their grammatical competence is different from the grammatical competence of native speakers (DeKeyser, 2000). However, in the last two decades, this view has been fine-grained in order to account for robust evidence that some grammatical features are more difficult to acquire than others. The interface hypothesis (Sorace, 2005; Sorace and Filiaci, 2006; Tsimpli and Sorace, 2009) is one such attempt to answer the following question: Which aspects of adult L2 grammars are very difficult if not even impossible to acquire? A core aspect of the hypothesis is the idea that linguistic properties that do not interface with other domains, such as the lexicon, pragmatics and discourse are attainable to native-like proficiency. On the other hand, linguistic properties that interface with other domains such as the lexicon, pragmatics and discourse show residual optionality even at the level of near-native proficiency. The residual optionality found in the interlanguage grammars of advanced adult L2 learners is caused by influence exercised by one of the languages (L1 or L2) on the other. The type of influence found is unidirectional in that it is the least complex syntactic system that influences the more complex syntactic system when these two systems are in conflict with respect to syntactic complexity. Syntactic complexity in this model is defined as follows: (a) syntactic structures that require the integration of syntactic knowledge with knowledge from other domains, such as the lexicon, pragmatics or discourse are more complex than syntactic structures that do not require such integration, and (b) a syntactic operation is less complex if it is required in every sentence; it is more complex if it is required only in some sentences because of semantic or pragmatic choices (Sorace, 2005, pp. 24–25).

The present study is an attempt to test the interface hypothesis by focusing on the linguistic property of subject-verb inversion in the indirect questions of advanced adult Arab learners of L2 English. The present paper is organized as follows. Section 1.1 provides a review of the literature on the acquisition of complex syntactic structures and identifies the gap that motivated the present study. Section 1.2 introduces the theoretical framework adopted in the present study together with the research question and the hypotheses. Section 2 is a description of the methodology used in the study. Section 3 reports on the results of the study. Section 4 is a discussion of the results of the study. Section 5 discusses some of the pedagogical implications of the paper. Section 6 concludes the study.

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1.1. Literature review

It has long been established that child language acquisition is characterized by convergence to the target language in that the outputs of the learning process of all children born in a given linguistic environment are very similar, pathological cases aside. The other characteristic property of child language acquisition is reliability, as children always succeed in learning their first language, pathological cases aside (Pullum and Scholz, 2002, p. 12). These two properties of child language acquisition contrast with adult second language acquisition, as the latter is characterized by non-convergence in that the outputs of L2 learners learning a given language are not uniform, in that the inter-language grammars of different L2 learners are not similar to one another. The second property of adult second language acquisition is non-reliability in that not all learners exposed to the same learning environment succeed in acquiring the L2 to native-like proficiency levels. Capitalizing on the differences between the process of first language acquisition and adult second language acquisition, some second language researchers took a strong position by proposing a fundamental difference between the two processes (Bley-Vroman, 1990, 2009). However, in the last two decades of research on second language acquisition, the view has shifted towards a more fine-grained position. Thus, rather than assuming an unconstrained divergence between the end state grammars of L2 learners and the grammars of native speakers, the interface hypothesis proposes a constrained divergence between the two types of grammars. The core idea in current adult second language acquisition research is that where L2 linguistic properties do not require integration of syntactic knowledge with knowledge from other domains such as the lexicon, pragmatics and discourse, the end state grammars of L2 learners are similar to those of native speakers; on the other hand, the L2 linguistic properties require integration of syntactic knowledge with knowledge from other domains such as the lexicon, pragmatics or discourse, the end state grammars of L2 learners diverge from the grammars of native speakers by exhibiting residual optional behavior that is unattested in the grammars of native speakers. In the last two decades or so, a number of studies have tested the interface hypothesis by investigating areas of interlanguage grammars where residual optionality (i.e., the co-existence in the interlanguage grammar of both the target form and other non-target forms) seems to be persistent even at the end state grammars of highly advanced and near-native speakers of a second language. Sorace (2005) investigated the use of overt and null subjects by near-native L1 English L2 speakers of Italian. In this language, subjects can be null (i.e., dropped) when they refer to a topic which has been introduced previously either by the linguistic or the situational context. The results indicate that near-native speakers of Italian show residual optionality (i.e., the use of overt and null subjects) in situations where native speakers would always use the null subject option. The researcher attributed the observed optionality to the fact that this area of Italian syntax involves interface between syntax and discourse.

A similar finding was obtained when Belletti and Leonini (2004) found that advanced adult speakers of different L1 backgrounds studying L2 Italian optionally use preverbal subjects in new information focus contexts where monolingual speakers of Italian would obligatorily use postverbal subjects. (Montrul and Slabakova, 2003) tested near native L1 speakers of Spanish on the semantic interpretations associated with the distinction between the preterit and the imperfect. In this study, near-native English L1 learners of L2 Spanish were tested on some of the interpretative properties associated with the distinction between the preterit and the imperfect. The results show that a significant number of their near-native participants (5 out of 12) do acquire the syntactic distinction between the two tenses, but they fail to show knowledge of the semantic properties associated with this distinction. Cuza (2012) tested L1 English heritage speakers of Spanish on subject-verb inversion in Spanish matrix and embedded questions. The results of the study show that the participants’ behavior was not different from the control group as far as matrix questions are concerned. However, unlike the control group, the participants accepted and produced non-target-like embedded questions where there is no subject-verb inversion.

Vaz Teixeira (2018) tested advanced L2 learners of English on three types of subject-verb inversion, the locative inversion, presentational there constructions, and free inversion structures. The results indicate that the learners had residual optionality only in cases where there is interface between syntax and discourse.

Research on the interface hypothesis involved participants with a number of L1 backgrounds such as English (Cuza, 2012), Spanish (Cuza, 2012), Italian (Sorace, 2005), Bulgarian (Ivanov, 2012), Turkish (Özçelik, 2017), Chinese (Yin and Kaiser 2013), and Korean (Park, 2013). There have been no studies, to the best of our knowledge, where the interface hypothesis has been tested with Arabic L1 speakers of L2 English. The present study is an attempt to bridge the gap in the literature and to contribute to the ongoing debate on the interface hypothesis. Also, the variety of Arabic chosen in this study, namely Omani Arabic, serves as a good testing case for one of the predictions made in the interface hypothesis. Sorace (2005) claims that in cases where there is evidence of crosslinguistic influence, it is always the less complex syntactic system that influences the more complex syntactic system in the process of adult L2 acquisition. In Omani Arabic indirect questions, both the subject-verb inversion option and the no subject-verb inversion option are acceptable in the embedded clauses of indirect questions. This makes the Omani Arabic syntax of indirect questions less complex than that of English, where only the no subject-verb inversion is allowed in the embedded clauses of indirect questions. If the predictions of the interface hypothesis are correct, any crosslinguistic evidence found in the linguistic behavior of the participants of this study should be unidirectional (from Omani Arabic to English and not vice versa).

1.2. Theoretical questions and hypotheses

The theoretical framework adopted in this study is that of the interface hypothesis. This framework assumes a generative approach to language, where the language faculty is a cognitive system of the brain, and this system is made up of the core modules of lexicon, phonology, morphology, syntax and semantics. According to the generative approach to language, syntax is the module which takes lexical items from the lexicon and combines them into larger structures. The output of syntax in this model of natural language must be read off by two types of systems (i.e., interfaces), internal and external. The first type of internal interfaces is where the output of syntax is read off by the phonological-phonetic component (also known as PF in the generative literature), which is responsible for assigning sound to the structure produced by syntax. The second type of internal interfaces takes place when the output of syntax is sent off to the semantic system (also known as LF in the generative literature) which is responsible for assigning meaning to the structure produced by syntax. The output of syntax also interfaces with two systems external to the faculty of language. In those cases where the acceptability of sentences depends on the previous or subsequent discourse context, syntax is assumed to interface with discourse. In other cases where the acceptability of sentences depends on knowledge of the world and universal pragmatic principles, syntax is assumed to interface with pragmatics. The model of language assumed in the interface hypothesis is represented in Figure 1 (based on Slabakova, 2016, p. 320).

Ever since the inception of the Minimalist Program (Chomsky, 1995 and onwards), it is assumed that syntax outputs the following hierarchical structure:

| (CP Specifier C [TP Specifier T [vP Specifier v [VP Specifier V (Complement)]]]]) |

The architecture given in (14) is assumed to represent a structure that is universal to all human languages, and language variation stems from the lexical features that each functional head (v, T, C) in different languages is endowed with.
Subject-verb inversion is analyzed in the generative literature as an instance of T-to-C movement, where T is a functional head, and C is a higher functional head in the universal structure of human language proposed in the generative literature (see Radford 2004 for example). Here, a crosslinguistic distinction is observed between languages such as English where there is subject-auxiliary inversion in simple questions, and subject-auxiliary inversion in the matrix clause but not in the embedded clause of complex questions, as in (1)–(3), and languages such as Spanish where there is obligatory subject-verb inversion in simple and complex questions, as is shown in (4).

In this study, Rizzi (1996) T-to-C movement proposal that crosslinguistic variation in subject-verb inversion stems from the fact that the feature [Wh/Q] on the functional head C may in some languages such as Spanish be strong, and this requires that not only the matrix and embedded clauses of complex questions, the wh-phrase move to the specifier position of the functional head C, and that the verb raise from v to T, and from T to C to check the strong feature of C. In other languages such as English, the [Wh/Q] feature on the functional head C is strong in the matrix clause of complex questions; therefore, the wh-phrase moves to the specifier of C, and the auxiliary verb moves from T to C. However, while the [Wh] feature of the embedded clause is strong, which requires that the wh-phrase move to the specifier of the embedded C to check the feature, the [Q] feature of the embedded C is weak, which means that the auxiliary verb does not move from T to C to check this feature in overt syntax, and therefore the verb remains in situ (see also e.g., Adger, 2003; Radford, 1997).

In the present study, we try to test the interface hypothesis by attempting to answer the following research question. Do advanced Arab learners of L2 English still show residual optionality with linguistic properties, where syntax does not interface with discourse or pragmatics? To answer the research question of the present study, the following three hypotheses are put forward.

Hypothesis 1. The grammatical knowledge of advanced Arab L2 learners of English indirect questions is different from that of native speakers of English.

Hypothesis 2. Advanced Arab L2 learners of English have no problem with English complex questions where the matrix clause does not have an interrogative force (hence, - Q). Therefore, learners should not encounter problems with sentences of the following structure [matrix clause: - Q; embedded clause: + Q]

Hypothesis 3. Advanced Arab L2 learners of English encounter problems with English complex questions where both the matrix clause and the embedded clause have an interrogative force (hence, + Q). Therefore, learners should encounter problems with sentences of the following structure [matrix clause: + Q; embedded clause: + Q].

The first hypothesis is motivated by the researchers’ anecdotal evidence based on observations made when highly advanced speakers of English were observed to produce sentences with subject-verb inversion in the embedded clauses of indirect questions. The rationale behind the second and the third hypotheses posited in this study is the following: In English indirect questions, one type of such indirect questions involves clauses where only the embedded clause, CP1 has the interrogative illocutionary force. This is illustrated in (5).

(5) [CP2 I don’t understand [CP1 why she is willing to take such a risk]].

CP 2: declarative force CP 1: interrogative force

It is hypothesized in this study that indirect questions of the type illustrated in (5) are predicted to be unproblematic for advanced Arab L2 learners of English because of the fact that although CP1 has the interrogative illocutionary force, this force is masked by the declarative illocutionary force of the matrix clause, CP2. In other words, the prediction is that learners will not make the error of inverting the position of the embedded subject and the embedded auxiliary verb and will instead accept and produce sentences that are grammatical in L2 English, the target language, where such inversion is ungrammatical, as is shown in (6).

(6) a. [CP2 I don’t understand [CP1 why she is willing to take such a risk]].

b. *[CP2 I don’t understand [CP1 why is she willing to take such a risk]].

Another type of English indirect questions involves sentences where both the matrix clause and the embedded clause have the interrogative illocutionary force. This is illustrated in (7).

(7) [CP2 Do you know [CP1 where the bus station is]]?

CP 2: interrogative force CP 1: interrogative force
It is hypothesized in this study that indirect questions of the type illustrated in (7) are problematic for advanced Arab L2 learners of English because of the fact that although both the matrix and the embedded clauses have the interrogative illocutionary force, only the matrix functional head C has a strong [Q] feature, which requires checking via a T-to-C movement. In other words, the cognitive difficulty predicted to occur here arises from the fact that learners have to be able to invert the positions of the subject and the auxiliary verb in the matrix clause, but to not invert the positions of the subject and the auxiliary verb in the embedded clause, as sentences with such inversion are ungrammatical in English. This is illustrated in (8).

(8) a. \([\text{CP2 Do you know [CP1 where is the bus station?]}]\) 
   b. \(\ast[\text{CP2 Do you know [CP1 where is the bus station?]}]\)

For the authors of the study, sentences such as (7) require more cognitive resources from the learners than sentences such as (6); therefore, learners are predicted to encounter problems with sentences of the type shown in (7), but not with sentences of the type shown in (6).

2. Method

This section discusses the methodology used in the present study.

2.1. Participants

Ten advanced Arab learners of English take part in the present study. All ten participants speak Omani Arabic as their L1. All participants are females in the third year of a 4-year Bachelor’s program in English Language and Literature in one of the universities in Oman. Four native speakers of American English formed the control group for this study.

The level of English proficiency is decided based on the fact that all the participants selected for this study have already received an IELTS band score of 7. According to the British Council (British Council, 2021), a test taker with a band score of 7 is described as a “good user”. The following is a descriptor of this band score: “You have an operational command of the language, though with occasional inaccuracies, inappropriate usage and misunderstandings in some situations. Generally you handle complex language well and understand detailed reasoning.”

2.2. Instrument(s)

Two tasks are used in the present study, an offline grammaticality judgment task, and an oral production task.

2.3. Data collection procedures

Task 1 is an offline written grammaticality judgment task which comprises 20 experimental sentences where only the embedded clause has the interrogative illocutionary force, 20 experimental sentences where both the matrix clause and the embedded clause have the interrogative illocutionary force, and 10 sentences that are used as distractors. For the experimental sentences used in the study, 10 sentences are grammatical, and 10 others are ungrammatical, as is shown in the contrast given in (9) and (10).

(9) a. I don’t know who the speaker is.
   b. \(\ast I\ don’t\ know\ who\ the\ speaker.\)

(10) a. What do you think she is going to do?
   b. \(\ast\ What\ do\ you\ think\ is\ she\ going\ to\ do?\)

The 10 distractors target features other than the subject-verb inversion feature investigated in the present study. The sentence in (11) offers examples of the distractors used in the study.

(11) a. She wants to talk to me.
   b. \(\ast She\ wants\ to\ talk\ to\ l.\)

An attempt is made to distribute the distractors evenly in Task 1. This meant that every 5 experimental sentences are followed by one distractor. Table 1 summarizes the offline written grammaticality judgment task used in the study. For a full list of the sentences used in the offline grammaticality judgment task, see Appendix A.

| Total number of sentences – 50 |
|--------------------------------|
| Type 1 sentences – 20 |
| Type 2 sentences – 20 |
| Distractors – 10 |

| Type of sentence        | Number of Sentences |
|-------------------------|---------------------|
| 10 grammatical sentences | 10 grammatical sentences |
| and 10 ungrammatical sentences | and 10 ungrammatical sentences |
| 5 grammatical sentences  | 5 ungrammatical sentences |

| Type of clause          | Number of Sentences |
|-------------------------|---------------------|
| Matrix clause: - Q      | Matrix clause: + Q  |
| (declarative illocutionary force) | (interrogative force) |
| Embedded clause: + Q    | Embedded clause: + Q |
| (interrogative force)    | (interrogative force) |

Task 2 is an oral production task which comprises 20 experimental sentences where only the embedded clause has the interrogative illocutionary force, 20 experimental sentences where both the matrix clause and the embedded clause have the interrogative illocutionary force, and 8 sentences that are used as distractors. In this task, the participants were told that they were going to play with the interviewer, who is one of the authors of the present study, a game called ‘complete the sentences’. In this game, the interviewer would raise a question, followed by a prompt, and the participants would have to put both the question and the prompt in a sentence. Each participant was informed that they would practice with a couple of examples with the interviewer before they were to be tested on the experimental sentences. The goal of the examples was to ensure that the participants knew what they were supposed to do. The examples offered in (12) illustrate the methodology used in Task 2. For a full list of the sentences used in the online oral production task, see Appendix B.

(12) Interviewer: We will play a game called ‘complete the sentences’. Here is how we are going to play it. I will raise a question, and then I will provide you with a prompt (i.e. a clue). Your task is to put both the question and the prompt together in a sentence.

   For example:
   Question: How old is she?
   prompt: I don’t know...
   Your sentence: 

   For example:
   Question: Does she enjoy music?
   prompt: do you know if...
   Your sentence: 

Now, we will begin the experiment:

3. Results

The offline written grammaticality judgment task was conducted to test the hypothesis that the grammatical knowledge of indirect questions among advanced Arab learners of English is statistically significantly different from that of native speakers of English. To test this hypothesis, an independent samples t-test was run. The results of this test show that the linguistic behavior of the advanced Arab learners of English (N = 10;
M 21.5 out of a total of 40; SD = 2.24) was statistically significantly different from that of the native control group (N = 4; M = 40 out of a total of 40; SD = 0). The p-value of the difference between the two groups on this task is p < .05 (p = 0.00000004). The results of the offline written grammaticality judgment task are represented in Figure 2.

Task 2, the online oral production task, was conducted to test the hypothesis that the grammatical knowledge of indirect questions among advanced Arab learners of English is statistically significantly different from that of native speakers of English. To test this hypothesis, an independent samples t-test was run. The results of this test show that the linguistic behavior of the advanced Arab learners of English (N = 10; M = 21.5 out of a total of 40; SD = 2.94) was statistically significantly different from that of the native control group (N = 4; M = 20 out of a total of 20; SD = 0). The p-value of the difference between the two groups on this task is p < .05 (p = 0.000000003). The results of the online oral production task are represented in Figure 3.

The grammaticality judgment task and the online oral production task were conducted to test the third hypothesis that advanced Arab learners of English have problems with indirect questions where there is a mismatch in the illocutionary force of the matrix clause and that of the embedded clause. To test this hypothesis, a dependent samples t-test was run. The results of this test show that the linguistic behavior of the advanced Arab learners of English (N = 10; M = 19.89 out of 40 on type 1 sentences; M = 20.2 out of a total of 40 on type 2 sentences; SD = 3.78 on type 1 sentences; SD = 3.32 on type 2 sentences) on type 1 sentences was not statistically significantly different from their behavior on type 2 sentences. The p-value of the difference between the behavior of the participants on the two types of sentences is p > .05 (p = .06). The results of the oral production task are represented in Figure 4.

4. Discussion

Three hypotheses are posited in this study, and these are repeated here for convenience.

Hypothesis 1. The grammatical knowledge of advanced Arab L2 learners of English indirect questions is different from that of native speakers of English.

Hypothesis 2. Advanced Arab L2 learners of English have no problem with English complex questions where the matrix clause does not have an
interrogative force (hence, - Q). Therefore, learners should not encounter problems with sentences of the following structure [matrix clause = - Q; embedded clause = + Q]

**Hypothesis 3.** Advanced Arab L2 learners of English encounter problems with English complex questions where both the matrix clause and the embedded clause have an interrogative force (hence, + Q). Therefore, learners should encounter problems with sentences of the following structure [matrix clause = + Q; embedded clause = + Q].

The results of the performance of advanced Arab learners of L2 English on the grammaticality judgment task and the online oral production task lend support to the first hypothesis of this study, as there was a statistically significant difference between the grammatical knowledge of advanced Arab learners of L2 English and that of the native control group.

With regards to the second and third hypotheses of this study, the results show no statistically significant difference in the performance of advanced Arab learners of English on the grammaticality judgment task and the oral production task between type 1 sentences where there is a mismatch in the illocutionary force of the matrix clause and that of the embedded clause [matrix clause: - Q, embedded clause: + Q] and type 2 sentences where is a match in illocutionary force of the matrix clause and that of the embedded clause [matrix clause: + Q, embedded clause: + Q]. In other words, the results of the study show that indirect questions in English prove to be a grammatical structure that is resistant to acquisition regardless of whether there is match or a mismatch in the illocutionary force of the matrix clause and that of the embedded clause. This result, therefore, disconfirms the second hypothesis of the study but confirms the third hypothesis of this study.

With the results of the present study in mind, we can now raise the question of the source of this error (i.e., subject-auxiliary inversion) in the interlanguage grammar of advanced Arab learners of English. One hypothesis that might be considered to explain the persistence of errors with indirect questions in English among advanced Arab learners of English is one of frequency. For example, it could be the case that indirect questions are quite infrequent in the input that L2 learners receive. There are, however, two reasons to argue against this hypothesis. The first is that indirect questions can be expressed by a variety of structures in English. The examples in (13) provide an illustrative list of such structures.

| (13) | a. … have no idea why… | b. … have no idea where… | c. … can’t believe what… |

(continued)

The second reason to doubt that the frequency hypothesis is on the right track is the fact that indirect questions do not seem to be quite infrequent in the input. For example, using the prompt *…don’t know what…* in the Corpus of Contemporary American English (Davies, 2008) returned 47467 tokens, and although a structure such as this does not necessarily mean that there is an embedded auxiliary (consider for instance, *I don’t know what happened*), this structure is a potential structure where one can find an auxiliary after the wh-expression (consider, for instance, *I don’t know what she is trying to do*). For example, using the following prompt *…know what he is…* returned 318 tokens in the Corpus of Contemporary American English all of which contain an embedded wh-clause with an auxiliary following the wh-expression ‘what’.

A second hypothesis to be considered is that the error attested is the result of crosslinguistic influence from the participants’ L1. There is evidence to support this hypothesis. To illustrate, consider some of the indirect questions in Omani Arabic.

| (14) | a. maa ?-aṭbakkar [CP leish laila saafar-at li-l-Siin] | b. maa ?-aṭbakkar [CP leish saafar-at laila li-l-Siin] | NEG 1SG-remember why Laila travel.Pst-3FSG PREP-DEF-China NEG 1SG-remember why Laila travelled to China. (Omani consultant) |
| (15) | a. maa ?-aḍri [CP l-saaʕa kam laila wissāl-at li-l-jaamʕa] | b. maa ?-aḍri [CP l-saaʕa kam wissāl-at laila li-l-jaamʕa] | NEG 1SG-know DEF-hour what Laila arrive.Pst-3FSG PREP-DEF-university NEG 1SG-know DEF-hour what Laila arrived at the university. (Omani consultant) |

The examples in (14) and (15) show that the S-V and the V-S order are both acceptable in the embedded clause of indirect questions in Omani Arabic. This result lends support to the claim made by the
proponents of the interface hypothesis (Sorace, 2005) that in cases of crosslinguistic influence, the directionality of influence is always from the less restrictive system to the more restrictive system rather than vice versa. In the case of indirect questions, Omani Arabic exhibits a less restrictive system than that of English, as both S–V order and V–S order are acceptable in the embedded clauses. English is a more restrictive system than that of Omani Arabic, as only one order, namely the subject–auxiliary order is acceptable in the embedded clauses of indirect questions.

Although the type of subject–auxiliary inversion error attested in this study may be attributed to the influence of L1, there is evidence from other L2 studies of English main and embedded questions that this explanation might not be the right one. For example, subject–auxiliary inversion errors in the acceptance and production of English embedded questions have been attested in the interlanguage grammars of L2 English L1 Chinese intermediate and advanced speakers, and this is despite the fact that Chinese is a language where there is no subject–verb inversion neither in main questions nor in embedded questions (Pozzan and Quirk, 2013).

In the present study, the advanced Arab learners of English seem to be behaving at the chance level, as their means in both the grammaticality judgment task and the oral production task are around 50%. Using the model of Rizzi (1996), this can be analyzed as a case of underspecification of the embedded [Q] feature in the interlanguage grammars of these learners. In other words, the embedded [Q] feature of these learners is neither strong nor weak. That explains the residual optionality of behavior in this structure. To explain why the subject–auxiliary inversion error is persistent in the interlanguage grammars of advanced Arab L2 learners of English, it could very well be the case that this is attributed to the fact that the [Q] feature is strong in L2 English main questions, but weak in L2 English embedded questions. In other words, the input that advanced L2 learners receive is confusing in that it contains evidence of a strong [Q] feature that triggers subject–auxiliary inversion in main questions, as well as evidence of a weak [Q] feature that does not trigger subject–auxiliary inversion in embedded questions. Alternatively, advanced Arab learners of English might at times overgeneralize the inversion rule that they have acquired with L2 English matrix questions and apply it to embedded questions.

We are now in a position to answer the research question of this study. Do the results of the study support the predictions made in the interface hypothesis? The claim in this study is that the results do not support the claim made in the interface hypothesis that linguistic properties at the syntax proper should be unproblematic at the advanced level of L2 acquisition. The results obtained in the present study show that residual optionality in the form of subject–auxiliary order and auxiliary–subject order is still attested in the interlanguage grammars of advanced Arab L2 learners of English. This is despite the fact that this structure does not involve any interface between syntax and discourse or pragmatics.

5. Some pedagogical implications

The results of the present study show that the non-target form of indirect questions where there is subject–auxiliary inversion in the embedded clause of indirect questions is still attested in the interlanguage grammars of advanced Arab (and learners with L1 backgrounds other than Arabic, as shown in (Pozzan and Quirk, 2013 and Cuza (2012)). The question of interest here is the following: in what way are the results of the present study useful for practicing teachers of English? We believe that practicing teachers of English can help advanced learners of English improve by engaging them in instructional activities where the target form (i.e., the no subject–verb inversion option of the embedded clause of indirect questions) is practiced. This suggestion is in line with recent research which shows that advanced L2 learners of English make durable gains with instruction on linguistic properties that are part of syntax proper and do not involve interface with discourse or pragmatics (Cuza, 2012, p. 355).

The question of interest in this regard is whether advanced (Arab) learners of English will benefit more from isolated focus-on-form activities or integrated focus-on-form activities (see Spada and Lightbown, 2008 on the distinction between the two types of focus-on-form instructional activities). In the present study, we postulated as one possible explanation for the residual optionality observed in the interlanguage grammars of advanced Arab learners of English the idea that this optionality might be attributed to the learners’ L1 influence which is less complex (hence more general) than that of L2 English in this respect. If this explanation turns out to be on the right track, then teachers of English are advised to use isolated focus-on-form activities to help their advanced Arab learners of English acquire the target L2 indirect question form. Evidence for this recommendation comes from research which advocates isolated focus-on-form activities in cases where there is L1 influence that results from the fact that the learners’ L1 structure is more general than the target L2 structure (Spada and Lightbown, 2008, pp. 194–195). Isolated focus-on-form activities are recommended for the target form of the present study even when teachers of English are dealing with an L1 other than Arabic. One of the factors that should be considered when teachers need to decide between isolated or integrated focus-on-form activities is the complexity of the target rule. Target forms that require very complex explanations benefit more from integrated focus-on-form activities; others that are relatively simple benefit more from isolated focus-on-form activities (Spada and Lightbown, 2008, pp. 194–195). In the case of English indirect questions, the rule is relatively simple despite the fact that the form itself is complex. Learners have to learn to apply the subject–auxiliary inversion rule in the matrix clause but not in the embedded clause.

6. Conclusion

This study was motivated by observations made by the researchers where highly advanced Arab Learners of L2 English were observed producing the erroneous subject–auxiliary inversion in the embedded clause of English indirect questions. The observations made by the authors of the study seemed to run counter to the claim made in one of the major hypotheses of L2 acquisition, namely the interface hypothesis. The hypothesis claims that linguistic properties at the syntax proper are not predicted to lead to residual optionality at the ultimate level of L2 acquisition; only linguistic properties where syntax interfaces with discourse pragmatics are predicted to lead to residual optionality at the ultimate level of L2 acquisition. To test this hypothesis, the study attempted to answer the following research question: is residual optionality in the form of subject–auxiliary order and auxiliary–subject order of English indirect questions still attested in the interlanguage grammars of advanced Arab learners of L2 English? Two major findings were obtained in this study. The first is that contrary to the claim made in the interface hypothesis, residual optionality is attested at the high level of English L2 acquisition even when the linguistic properties considered involve no interface between syntax and discourse or pragmatics. The second major finding of this study is that English indirect questions seem to pose a challenge to advanced Arab learners regardless of whether there is a match or a mismatch between the illocutionary force of the embedded clauses and that of the matrix clauses of English indirect questions. The major pedagogical implication of the present study is that English language teachers can help advanced L2 learners improve by engaging them in isolated focus-on-form activities that target the embedded clauses of English indirect questions.

This study has a number of limitations. The first is the small number of the participants who took part in the study. The second limitation is that only English L2 learners with L1 Omani Arabic are tested. An interesting follow-up on this study would be one that involves a larger number of participants, and more than one variety of Arabic. A future follow-up on the present study might also consider testing the interface
hypothesis on grammatical structures other than subject-verb inversion in English indirect questions.

Declarations

Author contribution statement

Iryna Lenchuk: Analyzed and interpreted the data; Contributed resources, materials, analysis tools or data.
Amer Ahmed: Conceived and designed the experiments; Performed the experiments; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

Data included in article/supplementary material/referenced in article.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

Supplementary content related to this article has been published online at https://doi.org/10.1016/j.heliyon.2022.e08752.

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