

Most challenging types of offline inferences for Chinese migrants when reading public notices in Spanish

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Dificultad de las inferencias offline para los migrantes sinohablantes en la lectura de avisos públicos en español. La comprensión del discurso escrito implica una función inferencial muy compleja. El presente trabajo aborda las inferencias aplicadas tras la lectura, denominadas *offline*, caracterizadas por ser elaborativas y complementarias. Mediante un muestreo no probabilístico por conveniencia, se realizó un estudio cualitativo descriptivo con 30 inmigrantes adultos sinohablantes, residentes en Madrid, divididos en nivel inicial, intermedio y avanzado según el test POEM (Ureña, Flores & Martín Leralta, en revisión). El objetivo era identificar el tipo de inferencias *offline* que suponía un mayor reto al leer avisos públicos en español L2. Asimismo, se analizó la influencia tanto de la frecuencia de aparición cotidiana de los avisos, como del nivel de dominio lingüístico. La prueba de lectura, validada por expertos en inferencias y en español como lengua de migración, permitió alcanzar resultados relevantes sobre la competencia lectora de este perfil de aprendices, con repercusiones didácticas para entrenar la habilidad inferencial.

Palabras claves: inferencias *offline*, comprensión lectora, aprendices sinohablantes, avisos públicos, español L2.

Written discourse comprehension implies a complex inferential function. In this study, we analyse those inferences taking place after reading (so-called *offline*), known to be elaborative and complementary. Following a non-probabilistic convenience sampling, we carried out a qualitative, descriptive study with 30 Sino-speaking adult migrants living in Madrid. The POEM test (Ureña, Flores & Martín Leralta, under review) divided them in 3 equitable groups of initial, intermediate and advanced level. The objective was to identify the type of offline inferences most challenging for the participants when reading public notices in Spanish L2. The frequency of appearance in daily life of those notices and the level of proficiency were also

analysed. Experts in inferences and in Spanish as a migration language validated the reading test. Results showed some relevant features of this reading profile and its didactic consequences to train the inferential skill.

Keywords: offline inferences, reading comprehension, Sino-speaking learners, public notices, Spanish L2.

1. Introduction

“Please, cover your mouth and nose to stop the spread”. We have read this notice quite often in the last few years, so we already know we need to use a face mask to do it, even if it is not explicitly stated. But which brain process is responsible for linking the action (covering) with the instrument (mask)?

Reading is a complex activity even in L1, and challenges only increase when reading in a L2. Many experts have considered reading as a constructive process, especially Rumelhart with his *schema theory* (1980): readers use the information they obtain from the text and they complete it with previously stored knowledge. This knowledge comes in the form of a schema in which the gaps are filled with inferential data.

Inference-making is a key element when we discuss language comprehension. Bruner (1957) considered the human brain as a machine capable of drawing inferences, since we are always activating previous knowledge and using it to enrich the message we are receiving. Thus, we define ‘inferences’ as the results obtained through the mental process readers must follow to deduce implicit information from the given text (the *stimulus*).

This conception about text understanding is still valid nowadays, since we assume that the inferential component appears in every processing act, in a sentence level or in a discourse level (Escudero 2010).

Even though inferences have received great consideration in linguistic and psychology, there are still some fields which have not been addressed. Whereas L2 inference research is also quite popular, it is hard to find studies dealing with Chinese participants with Spanish L2. In this case, we assessed four types of offline inferences when reading public notices in Spanish L2 and deemed which one was the most challenging. The influence of the frequency of appearance of the selected notices and the level of Spanish proficiency were also considered.

Applied linguistics have studied how and why humans learn languages, paying special attention to language learning styles and strategies to better understand the process. Inference-making is categorised as a “compensatory strategy” useful for “guessing from the context in lis-

tening and reading” (Oxford 2001: 14). In terms of reception, foreign language readers combine bottom-up and top-down processing while they make use of schemata and inferences by “deducing meaning from the co-text and linguistic context” and “exploiting linguistic clues” (Council of Europe 2020: 59).

Some research about inferences and their relationship with narrative, expository and argumentative texts has been carried out in recent years. Songyang & Chunyan (2013) studied the effects of working memory on Chinese EFL learners’ thematic inference generation during L2 *narratives* comprehension. Results showed that high-span learners responded significantly faster to topic sentences and had higher response accuracy during thematic inference processing. Discourse relation also influenced learners’ thematic inference construction but did not reflect on response accuracy.

Bengeil & Paribakht (2006) assessed the effect of EFL learners’ L2 reading proficiency on their L2 lexical inferencing while reading an English *expository* text. Interesting is the discourse-level meaning: more advanced readers had a higher percentage of correct and partially correct answers in the tests used and a lower percentage of wrong inferences than the intermediate-level readers. As for the quantity and type of inferences according to the discourse genre, Escudero & León (2007) explained that expository texts need more bridging inferences, while narrative texts usually require predictive inferences.

In the research of Hosoda (2014), Japanese EFL students were asked to read *expository* passages and complete activities to measure causal bridging inference generation online and offline. Regardless of L2 proficiency level, participants failed to make appropriate inferences during expository reading (online), but they did generate them when required to engage in extended reflection after reading (offline). Once again, high L2 proficiency readers were able to build stronger inferences than low proficiency readers.

Wolfe & Woodwyk (2010) combined *narrative* and *expository* texts in two correlated experiments to examine online processing and representation in memory of to-be-learned content. In terms of to-be-learned content, expository texts triggered students to utilise relevant prior knowledge more than narrative texts.

Argumentative texts were used by Valentini (2008) to assess the students’ skill to perform an inferential reading. L1 (Spanish) and L2 (French) texts were read and analysed, leading to the conclusion that students could more easily carry out an inferential reading of an argumentative text in L2. Possible causes were the markedly argumentative structure of the French language, as well as the in-depth analysis of texts students usually do in L2 classes.

However, few academic studies have dealt with other genres. In our research, public notices are employed, which can be arranged into the expository genre as they present some information, though sometimes they are considered a dialogue between the writer of the notice and the reader. The *Plan Curricular* for Spanish L2 (Instituto Cervantes 2006) points out that they are a genre that intermediate readers can understand: ‘advertising’, ‘propaganda’, ‘leaflets’ and ‘instructions’.

Nonetheless, discourse genre is not the only factor influencing the inferential process. Van den Broek *et al.* (2001) concluded that inference generation during reading is partly strategic and is strongly influenced by reading purpose. For this reason, we focused on two reading purposes classified in the *Common European Framework of Reference for Languages* (CEFR, Council of Europe 2001) in B level: reading for orientation and reading instructions.

When inference-making, the relation between this skill and one’s reading abilities is decisive (Etaywe 2013). Kispal (2008) concluded that poor inferencing skills result in poor understanding, and Hunt & Beglar (2005) explained that rich lexical knowledge depends on a proper use of inference strategies when reading. Barry & Lazarte (2011) analysed how domain-related knowledge, syntactic complexity, and reading topic influence inferences generation with English-speaking students of Spanish L2. High-knowledge readers generated a richer and more accurate mental model than low-knowledge readers.

Present research focuses on better understanding the comprehension process of Chinese migrants when reading public notices in Spanish by exploring how it works with real texts in realistic contexts regarding their L2. Almost 230.000 Chinese migrants were living in Spain in 2022 (INE), which has led this group to take part in the economic and social life of the Spanish society (Sáiz López 2005). The main objective of the study was to identify which type of offline inferences poses major problems for Sino-speaking adult migrants when reading public notices in Spanish as an additional language, taking into account the inferences, the frequency of appearance in daily life of those notices, and participants’ level of proficiency.

2. Theoretical background

2.1. Inferences in the reading process

The role of inferences in the three main models of discourse comprehension in psycholinguistics is reviewed.

Reading comprehension involves many activities and skills responsible for creating a coherent, mental representation of a text. This representation belongs to the final level of the *Model of Text Comprehension* by Kintsch & Van Dijk (1978), that is, the space where the reader combines any previous knowledge with the textbase to create a *situation model* (Clinton *et al.* 2020). This schema is retrieved from the reader's memory and filled with the new findings. So, Kintsch & Van Dijk's model lies on macro-structures (well remembered) and micro-structures (detailed, often forgotten) (Çokal 2012). Kintsch (1988) modified the theory in a latest version called *Construction-Integration Model*. Particularly interesting is the importance this theory places on the subject's mental context. Inferences are both universal and personal. Therefore, the global meaning will differ from one reader to another as it depends on how they relate and re-elaborate the ideas of the text and their background knowledge (Soto *et al.* 2019).

Regarding Sanford & Garrod's *Memory Focus Model* (1982), their main factors are the current discourse focus and the role of working memory in determining it, the linguistic properties of the anaphors and pragmatic inference derived from global coherence. Discourse processing consists of two steps: immediate processing (dealing with anaphors and their possible referents) and later processing (where disambiguation and structure integration take place). This model requires inference generation in both steps.

Finally, Gernsbacher's *Structure Building Model* (1990) considers the first step as a base for the mental structure upon which the reader later constructs the global meaning. These structures activate memory in different degrees, which explains why readers often forget information while reading: we activate the first-mentioned structure and move to the next one, leaving the previous activation behind. Gernsbacher & Faust (1995) complemented this theory by comparing memory nodes with the "blocks" used to build this meaning. These are activated by incoming stimuli, i.e., the new pieces of information included in the text.

Although some differences are found between the three mentioned theories, all of them agree on the vision that readers build a coherent mental representation in two or three steps. They incorporate new ideas to the existing ones and make associations between them. The result is that we always process more information than we explicitly read, because we link what we read with what we already knew about it (León 2001). This explains the enormous variety of inferences that can be produced while reading.

Not every author agrees on the classification of inferences, however. Generally speaking, there are two opposite views. On the one hand, the minimalist approach (McKoon & Ratcliff 1992) advocates for a simple

and practical inferential process: during reading, only the inferences really necessary to understand the text will be made. They are automatically processed and depend on the readily available information of the text, subsequently participating in the creation of more complex inferences. On the other hand, the constructionist approach states that the mental representation of a text is a model of the situation it describes (Graesser, Singer & Trabasso 1994; León 2001). The reader strategically makes, validates and rejects many inferences while they read to reach a global idea.

In recent decades, many constructivist researchers from Psychology and Discourse Processing (Balota *et al.* 1990; Graesser & Bower 1990) have discovered that just a group of inferences is drawn during reading (online), and some are made only after a recovery exercise (offline). Reading is a process which demands a great effort from the reader (León 2001), in the form of a scaffold: the reader needs to link the new item of the text with one in the working memory (from their prior knowledge or from the same text). Thus, this elaboration requires some time, which rejects the minimalist theory of the quick and basic inferential process.

Nowadays, this paradigm minimalist vs. constructionism has been replaced by a distribution of inferences along a continuum regarding generation probabilities (Escudero 2010). Readers make inferences under the influence of several factors, namely text genre, context, tasks, reading purpose... Consequently, a paramount inference for a reading task can be less relevant for another task.

The search for the local and global meaning of the text tries to create the already-mentioned situation model. The net of inferences and associations needed to complete the slots of the schema is quite vast. Although theories are still open to modification, authors share the idea that some type of inferences must be made online, namely those ensuring local coherence such as *referential* (deictic) and *causal antecedents* (explaining the reasons), and those preparing the global coherence as the characters' superordinate aims (supporting the actions in the text), the *global thematic inferences* (integrating the main interrelationships in the text) and the responsible for the emotional reaction of the character.

As León (2001) summarises, among the inferences generated after reading we find those complementing the information we have already understood: *causal consequence*, *pragmatic*, *instrumental* and *predictive*. They are case fillers or very probable inferences, based on Garnham (1992) and Graesser, Singer & Trabasso (1994), as part of the constructionist approach.

A different dichotomy addresses the coherence of a text: *bridging inferences* allow the reader to interpret the text, and *elaborative inferences* are not essential to link the ideas. Bridging inferences go back-

wards, helping to construct the meaning, whereas elaborative inferences go forward (Iza & Ezquerro 2000). Another point of view makes a distinction between inferences about the situation described in a text and about the topic or the motives of its writer (Iza & Ezquerro 2000).

We can also find literature (Iza & Ezquerro 2000) which organises inferences into four categories: *lexical inferences* (to solving ambiguity or anaphoric issues); *spatial and time inferences* (paramount in narrative texts); *extrapolative inferences* (to organise and link events by extrapolating beyond what is written); and *evaluative inferences* (readers need to assess some information to fully understand the text).

2.2. Factors affecting inferential competence

Aspects that influence general text understanding are word identification, fluency, vocabulary knowledge, working memory, comprehension monitoring, & inference generation (O' Brien *et al.* 2015: 161).

Factors can be classified into external and internal. The external “environmental and physical characteristics of a text” (Samuels 1983: 261) consist of text format, type size, layout (columns, margins), even illumination. The internal or “inside-the-head” factors (Samuels 1983: 263) depend on the readers themselves: their world knowledge, their cognitive resources, their viewpoint and purpose for reading.

Prior knowledge is a determining factor extensively studied (Bransford and Johnson 1973; Pearson, Hansen, & Gordon 1979; Steffensen *et al.* 1979; Burgoyne, Whiteley & Hutchinson 2011; Demir 2012; Elbro & Buch-Iversen 2013; Tabatabaei & Bagheri 2013; Al-Faki & Siddiek 2018; Shin, Dronjic & Park 2018; O'Reilly, Wang & Sabatini 2019; Kaefer 2020). Smith *et al.* (2021) studied the influence of background knowledge with primary school-aged children, determining that higher levels of background knowledge have a range of effects influenced by other aspects such as the nature of the text, the quality of the situation model required, and the presence of reader misconceptions about the text.

According to McKoon & Ratcliff (1992), two steps take place when generating an inference: the *activation* (the act of reading and resorting to working memory for prior information) and the *integration of information* (assimilation between previous knowledge and new content). Both are considered as passive processes influenced by “standards of coherence”, understood as “a set of implicit or explicit criteria for comprehension that readers employ during reading” (O' Brien *et al.* 2015: 162). They vary between readers and situations and are determined by the reading task and the text.

Activation does not necessarily imply integration, and so, inference-making. Cain *et al.* (2001) showed that readers tend to differ in the extent to which they generate inferences even if they received the same amount of relevant information. One potential source of individual differences could be the disparity of general knowledge amongst participants. Besides, the activation of the relevant information can be affected by working memory, as it controls the quantity of information and the efficiency of the retrieval process from the long-term memory (O'Brien *et al.* 2015; Shin, Dronjic & Park 2018).

García (1991) noted that time limitation does not seem to vary inference-making and text-understanding in native speakers *versus* L2 learners, and Goetz (2009: 179) concluded that readers tend to make “important” inferences and “highly salient premises were also found to increase the probability that an inference would be made”.

2.3. The discursive genre of public notices

Some researchers include public notices in the category “smaller written genres” (Dubrovskaya 2012: 304). The most studied aspect is the translation problems they present (Zhang 2009; Quian 2017). They are the link between language and society because they reveal “social tendencies, including those related to the ways of written public communication in the community and –on a larger scale– to language policies practised on a governmental level” (Dubrovskaya 2012: 307). We can distinguish the pragmatic elements that can be found in a public notice and the social knowledge one can deduce from a public notice.

Public notices are speech genres “created by different authors [...] in various situational contexts” –especially civil information and regulation– which “reflect the variety of mental patterns and types of relations between interactants” and usually address the recipient in an imperative way (Dubrovskaya 2012: 322).

The main function of public notices is regulating: telling people how to act. Paying attention to their communicative intention, we find five sub-genres: “Instructions, warnings, prohibitions, requests, and informative notices”. They share one common semantic element which is “I (do not) want you to do something and I tell you about it”, but each sub-genre has different semantic formulas (Dubrovskaya 2012: 310-312).

Another key aspect in readers’ inferential process is the author. Sometimes, they do not appear in the text; others, they are implied, can be deduced or are hidden completely.

The CEFR (Council of Europe 2020) differentiates two main reading purposes for “reading comprehension” in B level: reading for orientation and reading instructions.

Reading for orientation or search reading involves “skimming” and “scanning”; the reader selects specific information from “texts that are visual artefacts, rather than prose text, with helpful layout”, i.e., notices, leaflets. They can “understand relevant information in everyday material, such as letters, brochures and short official documents” (Council of Europe 2020: 55).

Reading for information contains a specialised form called “Reading instructions”. Topics are “instructions, from routine prohibitions on simple notices and simple directions to detailed conditions and complex instructions on something unfamiliar, possibly outside their area of expertise”, but texts are contextualised and familiar. Learners would apply the reading-instructions purpose when understanding “most short safety instructions (e.g., on public transport or in manuals for the use of electrical equipment)” (Council of Europe 2020: 58).

3. Empirical study

3.1. Design

A descriptive qualitative study was carried out with the aim of identifying the type of offline inferences most challenging for Sino-speaking adult migrants when reading public notices in Spanish as an additional language.

The present study is part of the R&D project EMILIA2 [PID2022-138973OB-C22]¹, aimed at studying the emotional dimension in the learning and communication processes of Spanish as a migrant language. Given the representativeness of the Sino-speaking population within the group of adult immigrants residing in the Community of Madrid, it is pertinent to pay attention to the particularities of learning and communication of this specific group of Spanish users. This was the criterion for the selection of the sample.

Thirty participants were selected through non-probabilistic convenience sampling. All were of Chinese nationality, of legal age, working and living in Madrid. They were administered the POEM test (Ureña, Flores and Martín Leralta, under review) to classify their level of oral competence in Spanish, so that 10 had an initial level (A), 10 had an intermediate level (B) and the other 10 had an advanced level (C).

The study addressed three research questions:

- 1) Which type of offline inferences are more challenging for adult, Chinese migrants who learn Spanish when reading public notices in Spanish L2?

- 2) Does the frequency of appearance in daily life of those notices influence their inferential process?
- 3) To what extent can the level of proficiency be the cause of disparity in the results?

The study variables were defined as follows:

- a. Type of offline inference: the most widely accepted classification (Singer & Ferreira 1983; Magiliano *et al.* 1993; León 2001) was taken. Four types were measured: causal consequence, pragmatic, instrumental and predictive.
- b. Frequency of appearance: participants' degree of likeliness to be exposed to these messages in real life. It was measured through a 4-point scale (1 *not likely at all* – 4 *very likely*).
- c. Level of linguistic proficiency: according to the POEM multi-level oral test of Spanish, the variable takes three values, namely initial level (A1 and A2 of the CEFR), intermediate level (B1 and B2) and advanced level (C1 and C2).

The four types of offline inferences are now put into operation. The *causal consequence* inference shows something that will happen next (Escudero 2010). They are not associated to text cohesion, but to coherence and macrostructure of the text (Moreno Campos 2008). The inference is expressed with words such as 'so', 'and so', 'thus' and 'therefore'.

Pragmatic inferences are the opposite to logical inferences, which are necessary and have a very high degree of certainty of the deduced information (Escudero 2010). They are based on the reader's general knowledge and never constitute an actual fact, just a possible one. Readers are never completely sure about them as they are cancellable: the conclusion we reach is realistic and likely, but we cannot guarantee their certainty (Ripoll Salcedo 2015). The answer to pragmatic inferences starts with 'it is likely that'.

Instrumental inferences compose the answer to the question 'how' and depend on the verbs mentioned in the text. They provide the instrument that the agent made use of to do a specific action (Moreno Campos 2008).

Predictive inferences are linked to the events that will happen later, but not necessarily related to cause and consequence. They "allow the reader to go beyond the text and presumably construct a richer understanding of a narrative" (Allbritton 2004: 309). The answer would begin with 'knowing that, something will happen'.

The data collection instrument was an inferential comprehension test of the reading of public notices in Spanish. The first group covers

all notices which want to *inform* the reader. The second group concerns all notices which aim to *modify* the reader's behaviour: instructions, warnings, prohibitions and requests. For each of the 4 selected offline inferences, 10 test questions were designed: 5 corresponding to informative and other 5 to instructions.

The decision to measure the inferential ability of migrants to understand public announcements stems from the communicative needs of this target population, according with the specifications of the LETRA Diploma (Baralo & Estaire 2011). It is relevant for them to learn the language required to perform in the public and professional settings (Baralo 2012). In accordance with the contents of the LETRA Diploma (Baralo, Martín Leralta & Pascual 2016), a tool to gauge competence for this performance must measure lexical, pragmatic and sociocultural knowledge in situational authentic contexts, through the discursive genres of these contexts.

The phenomenon is assessed after reading short texts of a certain contextual familiarity. Recall tasks are discarded and an *ad hoc* assessment of "comprehension of implicit or latent meaning" is designed (Alderson 2000: 94-95).

The test questions are aimed at the global comprehension of the text, using different techniques for their formulation, as is the case with the way of responding to the reading tasks we face in real life. A discrete-point approach is followed, since we do not measure general reading skills, but specific inferential processes.

Of the reading comprehension assessment techniques presented by Alderson (2000: 205-206), four are selected, and their instructions adapted to the L1 of the participants: multiple-choice, short-answer questions and sentence completion, yes/no/not given questions based on the writer's claims and matching techniques.

3.2. Procedure

Before being administered, the designed test underwent a double validation process, namely by experts and by users of Spanish as an L1 and as an additional language. Validation by experts pursued two purposes: to know its suitability to measure the inferential ability of participants (to answer research question one) and to ensure that the selected prompts matched the communicative needs of participants in their real life (in relation to the second research question).

For the first purpose, a validation questionnaire was designed to assess the accuracy of the instrument. It was administered via a Google form to five experts in reading inferences who had to determine whether each test question measured the intended inference in each case.

For the second purpose, another questionnaire was designed to test the degree of familiarity of the target migrants with the selected public notices. Seven experts in teaching Spanish to immigrants and refugees rated the frequency of exposure to the advertisements, using a 4-point Likert scale.

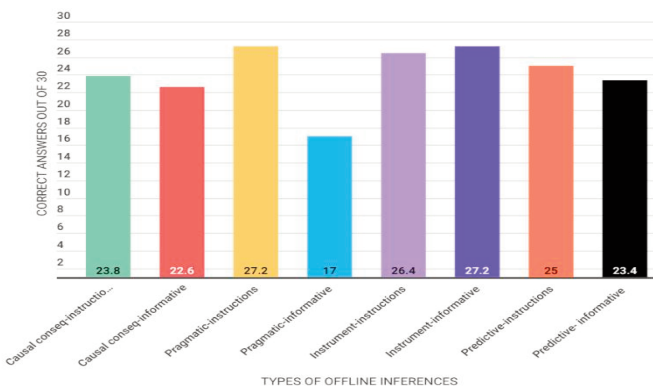
Validation with 23 users of Spanish L1 was used to check whether they were able to solve the inferential comprehension questions as expected for proficient readers. Validation with 2 learners of Spanish as an additional language served to identify possible comprehension problems in solving the task which were independent of inferential competence.

After adjustments following the validation results, the test consisted of 4 groups of 10 items which assessed one offline inference each (causal consequence, pragmatic, instrumental and predictive). 5 items evaluated public notices as instructions and 5 items assessed public notices as informative, so each inference was measured considering the two communicative intentions of public notices (see *Appendix 1*). It was decided to add instructions and solving examples in Chinese to avoid confusion in the solving mode. Participants could choose the language to answer the open-ended questions (Chinese or Spanish) to provide more accurate information about the inferences applied. Grammatical or lexical errors in Spanish would not be considered.

The test was administered to 30 participants through a Google form and supervised by the authors. Participants had initially completed the POEM multilevel oral proficiency test in Spanish and their classification by level was available.

3.3. Data analysis

Regarding the first research question, the data of the 30 participants are processed as a single group (see *Graphic 1*).

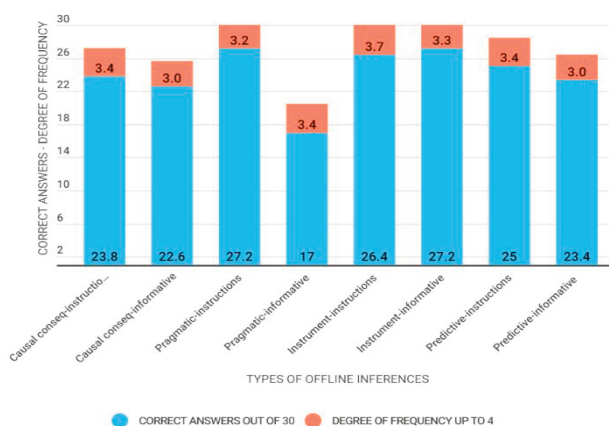


Graphic 1 – General mean results per type of inference

Causal consequence-instructions received a higher score ($M=23.8$, $SD=5.97$) than Causal consequence-informative ($M=22.6$, $SD=1.95$). Pragmatic-instructions ($SD=1.92$) and Instrument-informative ($SD=2.97$) obtained similar punctuation ($M=27.2$). Participants answered Predictive-instructions ($M=25$, $SD=1.22$) better than Predictive-informative ($M=23.4$, $SD=5.03$). Instrument-instructions followed the line of the previous categories ($M=26.4$, $SD=2.97$). These results showed that the most challenging type of offline inference for our informants is Pragmatic-informative inferences ($M=17$, $SD=14.14$). We performed a Jarque-Bera test: the final value was 4.89 and p value was 0.08. Therefore, we can conclude that data follow a normal distribution.

To determine whether there were any statistically significant differences between the means of the groups, an ANOVA test was implemented. The F value (2.72) is bigger than the critical F value (2.31), so the mean of one of these groups is statistically significantly different. Even though the probability of obtaining outliers is low, it exists, and this is our case in Pragmatic-informative inferences ($SD=14.14$). A high SD represents a bigger error when estimating because values are far from the distribution centre. This manifests an imbalance between the questions inside the Pragmatic-informative category but, even so, it does not invalidate the whole sample.

The second research question, whether the frequency of real-life occurrence of public messages influences participants' inferential comprehension, yielded the following data (see *Graphic 2*).

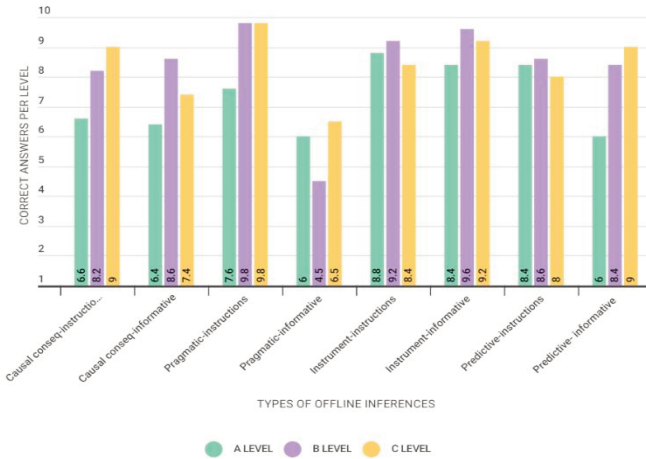


Graphic 2 – Degree of frequency related to number of correct answers per type of inference

The public notices used to measure Instrument-instructions inferences were the most common ones (3.7 out of 4), and this type of infer-

ence obtained 26.4 correct answers. So, if there were a correlation between these two variables, Pragmatic-informative inferences (the most challenging ones) would have received the lowest score for degree of frequency, but they have not. Instead, they have obtained the second highest mark for degree of frequency, 3.4 out of 4.

The third research question, concerning differences in inferential competence according to levels of linguistic proficiency, resulted as follows (see *Graphic 3*).



Graphic 3 – Mean results per type of inference and proficiency level

Again, Pragmatic-informative inferences were the weakest ones for the 10 (*n*) participants who had A level ($M=6, SD=5.66$) along with Predictive-informative ($M=6, SD=2.83$), then Causal consequence-informative ($M=6.4, SD=2.19$) and Causal consequence-instructions ($M=6.6, SD=3.65$). Pragmatic-instructions received higher score ($M=7.6, SD=1.14$) and Instrument-instructions inferences obtained the best results in this category ($M=8.8, SD=1.79$). Instrument-informative ($M=8.4, SD=1.52$) and Predictive-instructions inferences ($M=8.4, SD=0.55$) shared the same mean score. Participants with A level struggled more to infer certain questions, leading to a remarkable difference with B and C level learners.

For the 10 (*n*) participants with B level, the most challenging type of offline inference was Pragmatic-informative ($M=4.5, SD=4.95$). The rest of the inferences scored high, with standard deviations very close to 0. First, causal-consequence instructions ($M=8.2, SD=2.49$), then Predictive-informative ($M=8.4, SD=1.82$). Causal-consequence informative ($M=8.6, SD=1.14$) and Predictive-instructions ($M=8.6, SD=0.55$)

shared the same mean result. Instrument-instructions ($M=9.2$, $SD=0.84$), Instrument-informative ($M=9.6$, $SD=0.89$) and Pragmatic-instructions ($M=9.8$, $SD=0.45$) scored higher than 90%. In fact, results of B and C level participants were not strikingly different: they shared the same average as a whole category (8.4), and they failed the same type of offline inference.

The last group of 10 (n) participants with C level also found Pragmatic-informative inferences harder than the rest ($M=6.5$, $SD=3.54$). Results showed that some offline inferences can improve along with the level of proficiency, since an increase in the correction of questions in B and C levels *vs.* A level is seen in the figures. These are Causal consequence-instructions ($M=9$, $SD=0.71$), the already-mentioned Pragmatic-informative and Predictive-informative ($M=9$, $SD=1.22$). However, there are others that intermediate learners can perform equally or even better than more advanced learners: Causal consequence-informative ($M=7.4$, $SD=1.14$), Pragmatic-instructions ($M=9.8$, $SD=0.45$), Instrument-instructions ($M=8.4$, $SD=1.52$), Instrument-informative ($M=9.2$, $SD=0.84$) and Predictive-instructions ($M=8$, $SD=0.71$).

3.4. Discussion

Some offline inferences can be considered *more challenging* for our group of informants, namely Pragmatic-informative ones. Besides, inside the Pragmatic-informative category, results show a lot of volatility, since the SD is 14.14.

Two approaches can be considered to discuss this result: the discourse genre and the type of inference. Following Wolfe & Woodwyk (2010), the expository genre requires the reader to activate more prior knowledge for the new content presented than narrative texts, so it could be a cause for the obtained results. Participants had to make a special effort to understand and analyse every public notice of the study, regardless of the target inference type. This accords with Hosoda (2014), as the author highlights the difficulty EFL learners experience in making inferences from expository texts by themselves and remarks the importance of reflective tasks that elicit additional effort to make meaning from texts.

However, accepting this perspective would mean implied difficulties in every inference type, which is not our case. If we focus on Pragmatic inferences, it is hard to find articles dealing with pragmatic inferences alone or in relation to other offline inferences in expository texts, since taxonomy is different for each author. Pragmatic inferences and their relationship with memory have been studied (Chan & McDermott

2006; McDermott & Chan 2006), and some research has been carried out dealing with pragmatic inferences in Spanish L2 (Rai *et al.* 2011), but these results cannot be compared to ours because the variables were different. Some new questions and research lines will be exposed in the next section.

The second research question is answered thanks to validation by experts in immigration. Less frequent notices were the ones used to measure Causal consequence-informative, Instrument-instructions, Predictive-informative, and Pragmatic-instructions inferences. Even if they were modified to match the experts' criteria, we marked them as 'less likely' to be found anyway. However, all these inferences scored high in the questionnaire, and, curiously, Pragmatic-informative was not considered unlikely to be found by Chinese migrants. Therefore, the frequency of appearance in daily life of public notices did not influence the inferential process of our target group.

Sáiz Lopez (2005) claims that Chinese population lives and works in contact with the target society. In their daily use of the language, in this socio-working inclusion context, repeated exposure to this type of notices does not seem to affect their inferential skill.

The third research question depends on the results per linguistic proficiency. A level participants had more problems than B and C level informants in every type of offline inference, so we can conclude that inference generation is harder for students with a low level of proficiency in L2.

Nonetheless, this trend does not apply when comparing B and C levels. Causal consequence-informative, Instrument-instructions, Instrument-informative and Predictive-instructions are types of offline inferences in which B level informants obtained more correct answers than C level participants. The difference is not very remarkable (especially if we look at the standard deviation), but the numbers are somehow surprising. This adds some nuances to the belief that the higher the level of proficiency, the better the performance. In fact, it questions the conclusions in Barry & Lazarte (2011): high-knowledge readers generate a richer and more accurate mental model than low-knowledge readers, thus affecting the inferential skill. Something similar occurred in Bengeleil & Paribakht (2006), where advanced readers generated more correct lexical inferences than intermediate-level readers.

What are the possible causes explaining that sometimes intermediate learners perform similarly or even better in inferential tests than advanced learners? Samuels (1983: 263) states that the internal factors affecting inference generation are mainly readers' world knowledge, cognitive resources, viewpoint and purpose for reading. Maybe advanced learners overanalyse texts due to their higher knowledge of the language, or maybe they use more complex reading strategies

unnecessary for simple texts. Mavrou & Martín Leralta (2018) discovered some factors influencing migrants' reading skill in Spanish after examining several individual and sociodemographic variables in communicative competence. Age, longer time in Spain and educational level played an important role in reading comprehension. This kind of information was not considered about our participants, but results can have been affected by these factors as well.

4. Conclusion

This study aimed at exploring how comprehension processes of Chinese adult migrants work with real texts in realistic contexts regarding their L2. The objective was to identify the type of offline inferences most challenging for Sino-speaking adult migrants when reading public notices in Spanish as an additional language. The relation between the degree of appearance in daily life of public notices and the inferential process was also evaluated, as well as the influence of readers' level of proficiency. Every variable was measured examining how the discourse is processed and understood, since the research incorporates some cultural context that can only be evaluated from a global perspective.

There was no relation between the degree of frequency of public notices and the inferential skill, and the level of proficiency did affect participants' inference generation somehow. Pragmatic-informative was the most challenging type of offline inference, aspect to be studied in further research. It was proved that the difference between this mean and those of the rest of the groups is statistically significant. The fact that they are cancellable and based on the reader's personal world knowledge might be the cause, and should therefore be further investigated. Since the analysed variables have been disregarded as the cause for difficulty, other variables should be taken into account, namely individual factors (age, time of residence in Spain and educational level, as in Mavrou & Martín Leralta, 2018) and cultural and sociocultural distance.

Relevant contribution of this study is the inquiry into the relationship between genre and inferences. There is also some disparity in the name of types of inferences, which hinders the discussion since not every author classifies them similarly. To solve this problem, a simplified classification of inferences was provided in section 2.1.

Another novel aspect is the comparison among offline inferences themselves. We have also broadened the description of the reading profile in Sino-speaking migrants learning Spanish L2. Attention is usually directed towards oral skills, but reading is also paramount as they are always exposed to written messages.

In order to answer the questions posed, it was not necessary to delve deeper into the profile of the participants. We agree with Blanco Pena (2013) that Chinese learners of Spanish as a foreign language do not really constitute a homogeneous group, since we cannot assume, as the author indicates, that they know and share exactly the same L1, the same writing, the same system of phonetic transcription of their L1, a completely homogeneous culture or the same learning conditions, although it is true that there are linguistic and cultural roots shared to a greater or lesser extent, as he admits. The data obtained in this preliminary exploratory study point to the convenience of considering cultural and sociocultural distance when continuing to investigate inferential competence in reading in Spanish as a migrant language, although we agree with Cortés Moreno (2014) that the Sino-speaking environment brings together multiple cultures, so caution should be exercised when establishing generalizations.

This study can be useful for exploring other aspects of reading competence of Sino-speaking adult migrants, or for learning further details about their inference skill.

Inference-making is affected by prior knowledge, working memory and nature of the text, among others. Following a scaffolding design, it could be improved: L2 learners begin their language journey by making mistakes that might be corrected with practice and cognitive autonomy (O' Brien *et al.* 2015: 165). Teachers' duty is to help them to draw proper inferences and completely understand texts.

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Recepción: 25/04/2023; Aceptación: 15/03/2024

Notas

- ¹ Project entitled "Emotion in the learning of Spanish as an additional language and in bilingual communication in migration contexts", funded under the call for Knowledge Generation Projects 2022 of the State Plan for Scientific and Technical Research and Innovation 2021-2023 of the Ministry of Science and Innovation.

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