ABSTRACT

Title of dissertation: CROWDSOURCED MONOLINGUAL TRANSLATION

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An enormous potential exists for solving certain classes of computational problems through rich collaboration among crowds of humans supported by computers. Solutions to these problems used to involve human professionals who are expensive to hire or difficult to find. Despite significant advances, fully automatic systems still have much room for improvement. Recent research has involved recruiting large crowds of skilled humans ("crowdsourcing"), but crowdsourcing solutions are still restricted by the availability of those skilled human participants. With translation, for example, professional translators incur high cost and are not always available; machine translation systems have been greatly improved recently, but still can only provide passable translation, and for only limited language pairs at that; crowdsourced translation is limited by the availability of bilingual humans.

This dissertation describes crowdsourced monolingual translation, where monolingual translation is translation performed by monolingual people. Crowdsourced monolingual translation is a collaborative form of translation performed by two

crowds of people who speak the source or the target language respectively, with machine translation as the mediating device.

A general protocol to handle crowdsourced monolingual translation is introduced along with three systems that implement the protocol. The MonoTrans system initially established the feasibility of the protocol. Then, MonoTrans2 enabled lab experiments with a second implementation of the protocol. MonoTrans2 was also applied to a an emergency-response scenario in a developing country (Haiti). The MonoTrans Widgets system was deployed to a large crowd of casual web users with a third implementation of the protocol. These systems were studied in various settings, and were found to supply improvement in quality over both machine translation and monolingual post-editing.

CROWDSOURCED MONOLINGUAL TRANSLATION

by

Chang Hu

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Dedication

To Yu, dolphins and teddy bears.

Acknowledgments

No words can be enough to express my gratitude to all the people who have made this thesis possible, so I give my best approximation below.

I would like to thank my advisors Dr. Benjamin B. Bederson and Dr. Philip Resnik, among many things, for nurturing and coaching me through my graduate career. The two of you are very different in terms of research interest and method, but you both showed me how to think critically, to explore creatively and to work diligently.

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Finally, I would like to thank my parents for showing me the fascinating world of languages as early as possible; and my wife, for building with me a great solution to the problems in life by combining our complementary skills.

It is impossible to remember all, and I apologize to those I've inadvertently left out.

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Chapter 1

Introduction

Translation is becoming more and more important with the growing diversity of languages in which information is being distributed around the world [13]. Although recent advances in statistical machine translation has improved machine translation greatly [47], use of bilingual humans, especially professional translators, is still the norm whenever quality results are required. Solutions using bilingual humans often suffer from the bilinguals' relative scarcity. Although most of the world's population is bilingual [15], the number of language pairs spoken by bilingual people is still relatively small compared to all the possible pairs.

This dissertation presents crowdsourced monolingual translation, a new translation method that supports collaboration between two crowds of people who only speak the source or the target language, respectively. Crowdsourced monolingual translation uses machine translation to support collaboration among crowds of monolingual people, enabling them to perform translation. It can obtain high-quality output that neither machine translation nor any of the monolingual people could achieve alone.

1.1 Motivation

Professional translators can provide translation with the highest quality. However, professional translators usually incur a nontrivial cost, if they are available at all. On the other hand, machine translation provides a fast and low-cost alternative, but current machine translation systems are still insufficient for high quality applications.

Recent research has proposed crowdsourcing [68], an open call to the general population to recruit a crowd of skilled humans as workers to solve computationally-hard problems. Crowdsourcing brings good, economic solutions to some problems, such as image recognition [70][5] and automatic summarization [4].

However, most current crowdsourcing solutions are limited by their focus on *skilled* humans, a single crowd of workers who can solve the problem all by themselves. While some crowdsourcing solutions do have different roles for workers, they do not differentiate which worker takes which role (i.e., the workers are still presumed to have all the skills to take any role). For translation in particular, current crowdsourced translation systems use bilingual humans as workers. Therefore, even by recruiting many bilingual people, a crowdsourcing translation system can only translate between a small number of language pairs.

This solution space can be expanded to include *unskilled* humans, people who only have some of the skills to solve the problem. An example for such expansion is including monolingual humans in crowdsourced translation.

This work is also motivated by our own International Children's Digital Library

(ICDL) which has more than 4,000 children's books in 61 languages.[1] Part of the ICDL's mission is to "have every culture and language represented so that every child can know and appreciate the riches of children's literature from the world community". Prior to this dissertation, a group of volunteer translators already existed on ICDL. These volunteer translators were bilingual ICDL users who self-selected to translate children's books on ICDL. Although there are already many volunteer translators on ICDL, it is still difficult to translate between uncommon language pairs (e.g., between Croatian and Mongolian) or to translate most of the ICDL's books into most of the 61 languages. Crowdsourced monolingual translation aims to solve these translation problems by expanding translation to monolingual ICDL users who intend to help but do not speak two languages.[2]

1.2 A Synthetic Example

The essentials of crowdsourced monolingual translation can be illustrated in a simple synthetic example. In this example, two crowds of monolingual people engage in a dialog mediated by an automatic system to correct machine translation errors.[3]

In the example (see Figure 1.1), a sentence is being translated from Spanish to

[1]The ICDL is at: `http://childrenslibrary.org`.

[2]Chapter 7 discusses the deployment of MonoTrans Widgets, a crowdsourced monolingual translation system to ICDL.

[3]This example is constructed to illustrate several aspects of the crowdsourced monolingual translation protocol. For each aspect, there are many similar examples during the actual translation process.

English. The two crowds are the source language (Spanish) speakers and the target language (English) speakers. For simplicity, I assume that only one member from each crowd is involved in the translation.[4]

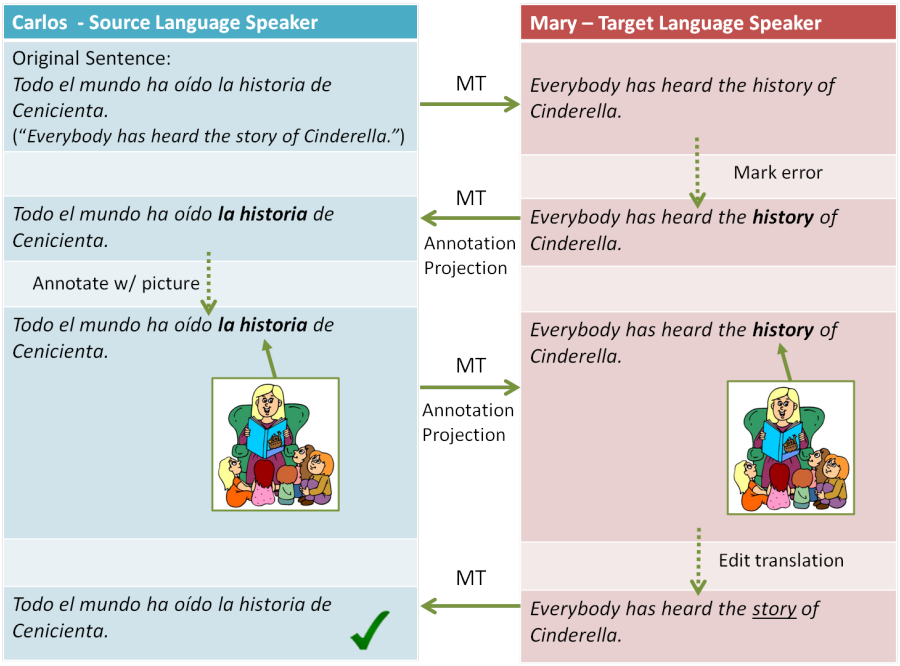


Figure 1.1: An example of the crowdsourced monolingual translation process. A solid arrow indicates a pass through machine translation and/or annotation projection in the system; a dotted arrow indicates editing and/or annotating performed by the monolingual people. Literal translation of the original Spanish sentence is shown. Note the annotations attached to the phrases are projected to the other side through annotation projection.

The original sentence is "*Todo el mundo ha oído la historia de Cenicienta.* (Everybody has heard the story of Cinderella.)". First, it is translated by machine translation into English: "Everybody has heard the history of Cinderella," in which

[4]In practice, each task at each step could be carried out by a different member from the crowd. See more discussions in Section 3.2.4

the Spanish word "*historia*(story)" is mistranslated into "history". (The Spanish word "*historia*" means "story" in this context but can also mean "history".) The English speaker reads this translation and indicates that there may be a translation error around the word "history" by marking it as problematic in the English translation. The marking (which is in effect an annotation) on the word "history" is then projected back onto the original sentence and onto the corresponding word "*historia*". The Spanish speaker now sees the sentence with projected error mark: "*Todo el mundo ha oído la* ***historia*** *de Cenicienta.* (Everybody has heard the **story** of Cinderella.)". He tries to explain the marked word by attaching to it a picture about stories (in this case a picture about a lady telling a story). The system attaches the same picture to the corresponding English translation "history". Since "history" was marked as a translation error and now has a picture annotation, the English speaker is able to infer its meaning and to edit it into the correct word "story".

Finally, the corrected English translation is back-translated into Spanish. Because the back-translation's meaning matches that of the original sentence, the Spanish speaker judges that the translation process has reached the satisfactory goal state.[5] By definition of the English speaker's task, this is the best edit she can make, so the English speaker would also stop once the translation has been accepted by the Spanish speaker.

[5]In this example, the back-translation is the original sentence, but the protocol only requires that their meaning match.

1.3 Research Questions and Hypotheses

The small synthetic example in Section 1.2 shows that through a dialog mediated by machine translation and language-independent annotations, monolingual people can collaboratively identify mistranslated phrases, add more information to those phrases and eventually correct translation errors. In particular, the system creates a feedback loop between the source language and the target language speakers. This feedback loop includes not only machine translation, but also language-independent annotations (the picture) which enhance communication between two monolingual crowds by decoupling the communication from unreliable machine translation. Through the feedback loop, the source language speakers and the target language speakers are engaged in a dialog during which they collaboratively improve translation quality.

To understand crowdsourced monolingual translation beyond this simplified case, this dissertation seeks to answer the following questions:

1. **Q1:** Is it possible to perform translation by supporting collaboration among monolingual people with an automatic system?

2. **Q2:** How effective is the feedback loop in supporting such collaboration?

3. **Q3:** How effective are the annotations in supporting such collaboration?

In response to these questions, I seek to validate the following hypotheses:

1. **H1:** Crowdsourced monolingual translation, a protocol supporting collaboration among monolingual people, performs better than machine translation

and monolingual post-editing in terms of translation quality.

2. **H2:** The feedback loop improves translation quality.

3. **H3:** Overall, using annotations during the translation process improves translation quality; each type of annotation also improves translation quality.[6]

1.4 Contributions

As I will show in chapters 5, 6 and 7, H1 was found to be true. A system (MonoTrans2) that implemented the crowdsourced monolingual translation protocol performed better than monolingual post-editing with a 0.30-point average improvement ($p < 0.001$) on a 5-point accuracy scale (Chapter 5). Systems that implemented crowdsourced monolingual translation also performed better than pure machine translation. In one experiment, the percentage of high quality sentences improved from 10% to 68%.

Studies did not confirm H2 with statistical significance due to the difficulty in recovering the feedback process from data collected with systems that used the asynchronous interaction model (Section 3.2.4, page 45). However, preliminary analysis (Section 7.4.4, page 155) still showed that the feedback loop may improve translation quality if it forms a successful clarification dialog.

Regarding H3, an analysis (Section 5.4, page 95) confirmed that using annotations during the translation process improves translation quality. Among all the annotation types analyzed, most of them improved translation quality.

[6]More discussion about annotation types is in Chapter 3.

In summary, the main contributions of this dissertation are the:

- Design and application of a crowdsourced monolingual translation **protocol**. The protocol uses machine translation to support collaboration between two crowds of monolingual people, enabling them to perform translation. It can obtain high-quality output that neither machine translation nor any of the monolingual people could achieve alone. (Chapter 3)

- Design, implementation and evaluation of **MonoTrans**, a system that implements the crowdsourced monolingual translation protocol with a synchronous interaction model. MonoTrans performed better than machine translation in terms of translation fluency and accuracy. (Chapter 4)

- Design, implementation and evaluation of **MonoTrans2**, a system that adapts the crowdsourced monolingual translation protocol used in monotrains to a different, asynchronous interaction model. MonoTrans2 allows monolingual users to participate in the translation in parallel with each other. It also obtained higher-quality output compared with machine translation alone. (Chapter 5)

- **Study** that compared MonoTrans2 with post-editing, a common practice in the translation industry using machine translations. The comparison showed that crowdsourced monolingual translation is better than monolingual post-editing and is close to bilingual post-editing in terms of translation quality. (Chapter 5)

- **Case study** in which monolingual Haitian Creole speakers[7] from Haiti used MonoTrans2 to translate text messages sent after the 2010 Haitian Earthquake[8]. This study showed the effectiveness of MonoTrans2 with real users from a developing country. (Chapter 6)

- Design, implementation and evaluation of **MonoTrans Widgets**, a system that uses micro-tasks and presents the tasks as embedded widgets. The MonoTrans Widgets system was the first attempt to deploy crowdsourced monolingual translation to casual web users live, and it also obtained higher-quality output compared to machine translation alone. (Chapter 7)

- **Analysis of translation processes** captured by MonoTrans Widgets. The analysis showed that the crowdsourced monolingual translation protocol was effective in detecting and correcting machine translation errors through the interaction between monolingual source language speakers and target language speakers. (Chapter 7)

Supporting monolingual humans to perform translation provides the research community with a new alternative to translation with bilingual humans or machine translation. It also opens up the opportunity to developing new crowdsourcing system with unskilled humans.

[7]The Haitian Creole speakers did not speak English.

[8]In collaboration with English speakers on the other side.

Chapter 2

Related Work

Crowdsourced monolingual translation aims to computationally support collaboration between two crowds of monolingual people, each speaking only one language. It fits into the relatively unexplored intersection of two domains: crowdsourcing and translation. Crowdsourced monolingual translation provides an alternative solution to the crowd availability problem: It uses two crowds of people to solve a problem neither crowd can solve alone. In particular, it tries to obtain high-quality translation without involving bilingual people.

This chapter first discusses three critical problems for crowdsourcing: crowd availability, task design and quality control. It then discusses the place of crowdsourced monolingual translation among current translation solutions.

2.1 Crowdsourcing

Crowdsourcing is an open call to recruit a crowd of people to solve a problem collectively [58][43][48]. More broadly, it can be considered a means of aggregating work from a massive population [68][23]. The properties of effective crowdsourcing solutions are outlined by Surowiecki in the book *Wisdom of Crowds* [68]:

1. **Diversity of opinion:** "Each person should have private information even if it is just an eccentric interpretation of the known facts."

2. **Independence:** "People's opinions are not determined by the opinions of those around them."

3. **Decentralization:** "People are able to specialize and draw on their own local knowledge. "

4. **Aggregation:** "Some mechanism exists for turning private judgments into a collective decision."

Because crowdsourcing effectively lowers the cost of human labor, it has the potential to solve computationally hard problems that traditionally required either expensive work from a few trained professionals or extensive effort to develop automatic systems[1]. Examples of such problems are image understanding [5] [70], planning [2], text editing [4] and translation [76] [75] (Table 2.1 on page 11)[2].

Table 2.1: Crowdsourcing applications and the problems they address.

Name	Problem
ESP Games [70]	Vision
VizWiz [5]	Vision
Soylent [4]	Text summarization and synthesis
Mechanical Turk Translation [76]	Translation
AppSheet [2]	Planning

For crowdsourcing systems to be effective, three problems are critical: crowd availability, task design and quality control. First of all, crowdsourcing systems have to recruit people to perform tasks; secondly, the tasks should suit the workers'

[1]The term"crowdsourcing" in general also refers to systems that solve problems other than computational, but here I focus on solving computation problems with large crowds of people.

[2]Crowdsourced translation is discussed separately in Section 2.2.5.

expertise, available time and effort; finally, systems have to ensure that the workers complete the tasks well. These three problems are related to each other and are often considered together when designing a system. For example, the nature of the tasks is often directly related to size, motivation and possible bias of the potential worker population. For simplicity, however, I discuss each one separately below.

2.1.1 Crowd availability

Any crowdsourcing system must first recruit people to perform its tasks, and finding those people is not always straightforward. Recruiting usually gets harder with more complex tasks. For example, while finding people who can describe objects in pictures [70][5] is relatively easy, it is not as easy to find people who can translate from one language into another [76].

It is easiest to find human workers if a system's tasks involve only everyday skills. Since everybody has the skills to do the tasks, such systems have a very large population to recruit from. Examples of such tasks are describing objects in a picture [70][5], describing a piece of music [42] or shortening a sentence [4]. One typical example involves image understanding. While image understanding is a very hard problem to solve computationally. It is a much easier problem for most humans. Therefore, systems whose main objective is to understand and describe pictures [70] [5] can draw workers from a very big population.

Recruiting human workers with less common skills is more difficult. Although various research has shown that lay people can have performance comparable to

experts [54][65][8], there are still some tasks which not everybody can perform (e.g., one has to speak two languages to translate). While people with specific skills can be recruited through self-selection (e.g., editing an article in Wikipedia[3]) or online labor markets (e.g., Amazon Mechanical Turk[4]), forming and maintaining a crowd of skilled workers usually requires dedicated worker management in the system. For example, a crowd of workers whose work is high-quality can be selected by qualifying tests or previous performance. These good workers are then kept for future tasks by paying an explicit bonus [76] or by forming a worker community around the system [37].

There has been a long term research interest on using crowdsourcing to support more complex tasks such as design [74] and planning [77]. For complex tasks, crowd availability is an especially big problem because there are fewer willing workers. The common solution is to decompose these tasks into smaller subtasks and assign each to a different worker. For example, a creative design process can be decomposed into generations of creative ideas, crossover between ideas and selection of the best ideas [74]; editing a sentence can be decomposed into finding an error to edit, fixing the error, and verifying the correction [4].

While there are many solutions to the crowd availability problem, these solutions usually share a common view: that tasks in the system are homogeneous. In other words, tasks are treated the same as each other and workers are treated

[3]More precisely, editors of a Wikipedia article usually have domain-specific knowledge instead of skill.

[4]`http://mturk.com`

as interchangeable, assuming that any worker can complete any task. With this view, only workers with the skills applicable to solving all the tasks are recruited. For example, systems with translation tasks recruit only people who can speak both languages [76]; a system with assignment-grading tasks recruits only students who studied the subject [22]. These systems even use cleverly-designed methods to ensure that only workers with suitable skills are recruited [76][22].

Some systems do give different tasks to different workers [4][46]. For example, some users can be "verifiers" who vote on other workers' output; there can also be multiple sets of subtasks, each set with its own verification [46]. However, these systems still treat different workers roles as interchangeable, and any role can still be given to any worker. For example, although Soylent [4] has three different roles, one user can be given any one of the three.

This homogeneous view of tasks and workers can be limiting when it comes to tasks that have very few potential workers. Complex tasks belong to this category, but tasks do not have to be complex to have limited number of workers. For example, translating a sentence from Arabic to English, no matter how simple the sentence is, is restricted to the crowd of Arabic-English bilinguals, and this crowd is much smaller than the whole population of web users.

For translation, in particular, although most of the world's population are bilingual [15], the number of language pairs spoken by bilingual people is still relatively small compared to all the possible pairs. For example, it is hard to find a Croatian and Japanese bilingual speaker.

Crowdsourced monolingual translation tries to solve the crowd availability

problem in a different way: by decomposing the task among crowds with different skills. For translation, this means using two crowds of monolingual people instead of one crowd of bilinguals.

2.1.2 Task Design

Task design in crowdsourcing is a central issue because it is closely tied to user motivation and output quality. In some systems, tasks are the same or directly related to the requesters' objective [5][4][11]. In others, tasks are carefully designed to hide the requesters' objective and to guarantee output quality [42][71].

For systems designed to support complex tasks in particular, two competing issues are worth more discussion: task granularity and task context. More complex tasks usually calls for more context; however, because the overall task is complex, it usually needs to be decomposed into smaller subtasks, which in turn limits the amount of context that can be provided.

Task granularity is the size of the tasks that workers are assigned. Many systems assign small tasks to users [70][42][71]. Some decompose tasks into smaller subtasks [4][74][46]. Smaller tasks are usually favored because they reduce each person's work load, making it easier to recruit workers. Smaller tasks also help systems minimize variance among workers [43]. However, some research has demonstrated systems that can support bigger tasks [29][77]. Huang et al [29] showed that bigger tasks are better for introducing unique results while controlling cost. Zhang et al [77] argued that complex tasks are necessary to maintain global constraints.

Task context is the information provided with the tasks themselves. Such information is especially important when a set of tasks have the same global constraints [77]. For example, in a crowdsourced solution for trip planning, human workers who plan each step of the trip should be made aware of the total budget of the trip.

Providing more contextual information about the task usually increases the workers' cognitive load, but doing so does not necessarily make the task harder. On the contrary, putting the task in context helps the workers. A common example among crowdsourcing systems is that even partial solutions to related problems can improve the workers' accuracy for solving the current task [46]. Zhang et al [77] also claimed that context need not be omitted to keep workers focused, but that workers' attention in a context-rich task can be directed to different focuses. For example, Mobi [77], a crowdsourced trip planning system, shows all the planning tasks to its workers but also alerts the workers tasks that need work (Figure 2.1).

Extra care must be taken to provide the right context since providing some kinds of information may violate the underlying principles of independence and decentralization (Section 2.1). For example, in iterative tasks, earlier solutions may set a strong example for future solutions. As reported by Little et al [46], in an iterative crowdsourced brainstorming experiment, workers' suggestions were heavily affected by best ideas they saw in the previous iterations.

With crowdsourced monolingual translation, it is also crucial to maintain the balance between task granularity and context. I will revisit this issue in Chapter 7.

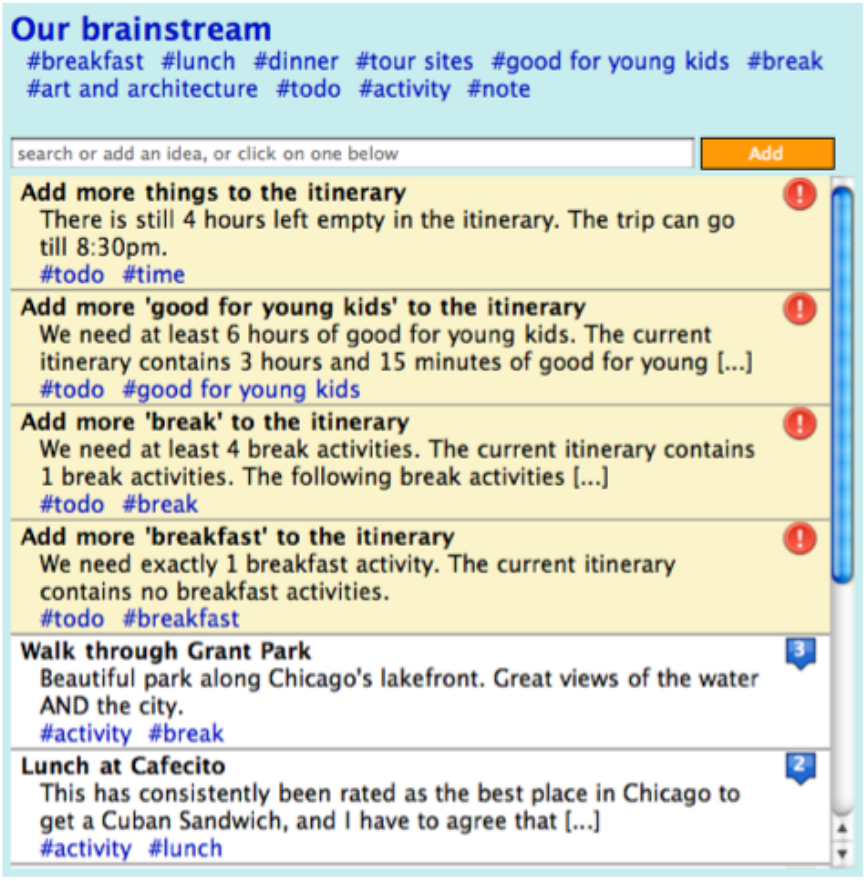


Figure 2.1: The todo list in the Mobi crowdsourced trip planning system (From [77], Figure 4). The system alerts workers what needs work.

2.1.3 Quality control

Since a crowdsourcing system makes an open call to the public, it is critical to ensure high quality from a diverse crowd of workers. Quality control in crowdsourcing systems often relies on redundancy (See [43], Quality Control), whose rationale is that since there are many workers, some of the workers' effort can be "wasted" in order to obtain high quality output.

One simple way to use redundancy is to deploy the same task to multiple

workers and compare the workers' output. There are multiple ways to aggregate output from repeated tasks. The simplest solution is to only accept the answer most workers agree on [46]. Voting is one way to apply the majority rule. It is usually used with a dedicated group of "verifiers" specifically set apart from the crowd of workers to check the workers' output [46][4]. For subjective answers (such as translation or text editing) or tasks that are not exact duplicates (for example, only partially overlapping tasks [41]), systems may use more intelligent combination methods.

More delicate verification methods exist. In the ESP game [70], a pair of workers are assigned the same task and are rewarded only when their outputs match. In reCAPTCHA [72], a task contains two questions, one of which (unknown to the user) has a ground-truth answer, so the worker's best strategy to be rewarded is to answer accurately. Although different than voting at first glance, these methods still rely on increasing redundant user effort. In the ESP game, two workers do the same task. In reCHAPTCHA, half of every worker's effort is "wasted" on answering the verify question.

As we will see later in Chapter 3, the crowdsourced monolingual translation protocol is an iterative protocol with which monolingual people improve on each other's changes to the initial translation. In this way, redundancy is introduced into crowdsourced monolingual translation for quality control. Some crowdsourced monolingual translation systems also use voting explicitly. (See Section 3.2.3 for a discussion on quality control using aggregated human solutions.)

2.2 Translation Solutions

Translation is a complex and creative task which traditionally involves only professional translators, or bilingual people who are specifically trained for the job. Although professional translators can provide the highest quality translation, they are usually expensive to hire. For certain language pairs, professional translators or even bilingual people are not even available.

There are attempts to extend translation beyond what is provided by professional translators, and the most successful ones involve statistical machine translation [47]. In the past decade, statistical machine translation systems have reached usable quality between many language pairs, and some general-purpose systems have become publicly available.

However, machine translation has yet to reached the high quality output typically provided by professional translators or even simply bilinguals. To bridge this gap, several other attempts were made to either combine humans with machine translation [35][7] or more recently, to use a crowd of amateur bilingual people to do translation [76].

These translation solutions are discussed in the following sections in more detail.

2.2.1 Professional Translators

Highest quality translation is usually provided by professional translators. Professional translators are not simply bilinguals, but those who took years of training

and practice. As a result, professional translation service usually requires payment of a substantial fee. In addition, professional translation service usually has a minimum order size. For example, translating from English into Spanish costs about $0.10 per word, and translating two six-word English sentences into Spanish costs $45, as a result from the minimum order size.[5]

Professional translation service also takes time. A typical professional translator's speed is 1,000 to 2,500 words per day.[6] Some translation companies even provide online service with a shorter turnaround time.[7] However, no professional translation service can be instantaneous.

2.2.2 Machine Translation

Researchers have been constantly trying to extend translation beyond professional translators. During the last twenty years, a revolution has taken place in computational research on translation: machine translation systems that used to rely on human knowledge about grammar and meaning provided by language experts have been replaced by systems that learn statistical models from large collections of translated text [47].

This change in approach has made it possible to translate unrestricted input

[5]The quotes were taken from SDL's translation service, at: `http://www.click2translate.com/quote/quick_quote.asp`

[6]This information was taken from Translia, at: `http://www.translia.com/translation_agencies/`.

[7]For example, myGengo claims to have a 4-hour turnaround time for texts shorter than 250 words, information taken from `http://gengo.com`

from a far broader spectrum of languages. With statistical machine translation systems, usable translation quality can now be obtained between a number of language pairs, and there are online machine translation systems [30] [20] that offer fast and free general-purpose translation. Machine translation engines can also be built relatively quickly between language pairs not previously available (for example, between "surprise languages" [55]).

However, machine translation has drawbacks, too. While "usable" quality makes machine translation very helpful for casual translation needs (e.g., finding the correct link on a web page, getting the gist of a news story, etc.), it is not sufficient in situations where high quality translation is preferred (e.g., literary translation, legal translation). While translation systems can be built quickly [55][44], for most language pairs not involving English, systems still lack even the most basic ability to create comprehensible translations that preserve basic meaning.

2.2.3 Machine-Assisted Translation

Since both machine translation and professional translators have their pluses and minuses, Kay [35] proposed that the best role for computers in translation is not as fully-automatic systems, but as supportive technologies for human translators.

Such supportive technologies have been successful in many cases. For example, translation memories, or databases that store translated sentences or sub-sentential segments, have existed for years [40][31][19]; post-editing machine translation is a practice in the translation industry [1]. Recent advancement in the such technologies

has made them available to the general public. The Google Translator Toolkit is a free online service that integrates machine translation, post-editing and translation memories. It also supports collaborative translation among a group of translators (Figure 2.2).

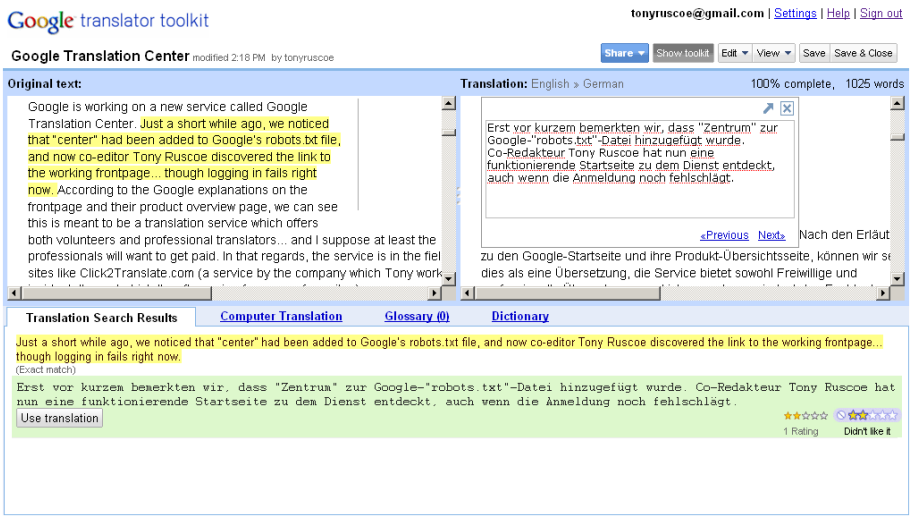


Figure 2.2: The Google Translator Toolkit user interface showing the source text (left), post-editing of machine translation output (right) and translation memory support (bottom).

Some researchers have exploited statistical machine modeling to build translation environments that help bilingual human translators do their work more efficiently. For example, TransType integrates a prediction engine that makes translation suggestions as the translator types [16] (see Figure 2.3 on page 23).

2.2.4 Translation by Amateurs

Amateur translation has long existed parallel to professional translators. Groups of amateur translators have been carrying out audiovisual translation of films and

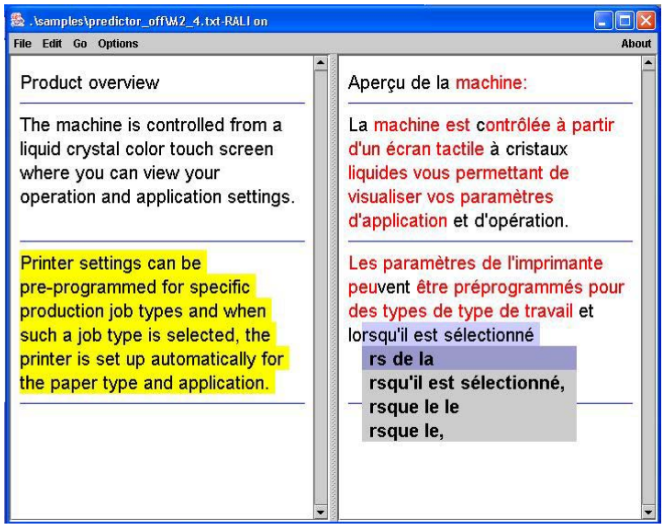


Figure 2.3: The TransType2 user interface (taken from [16], Figure 1).

television programs since the 1980s (known as fan-subtitles or fansubs [60]), and this type of amateur translation has become more widespread recently with the help of the Internet. Fansub groups are usually formed in online communities among bilingual people who are interested in the same topics and who take upon themselves the task of translating and introducing related materials from other languages into their own language. These groups are usually small and stable in that their members usually do not change for an extended period of time. On the other hand, unlike professional translators, the material being translated is usually highly topic-focused.

Some websites have started encouraging and even organizing amateur trans-

lation to serve as the websites' own content[8]. Yeeyan.com[9] is a volunteer-based community translation effort involving translation of web content, primarily English blogs, into Chinese. Meedan.net[10] is a similar website which supports machine translation with post-editing by a community of volunteer translators for materials in Arabic and English.

Gengo.com[11] is a translation service which relies primarily on amateur translators. The price of amateur translation with Gengo.com is much lower than professional translation.

2.2.5 Crowdsourced Translation

Recently, there is some success in using a crowd of untrained bilinguals in the place of professional translators [76]. This approach is called crowdsourced translation. Crowdsourced translation organizes translation among a crowd of bilingual people by assigning each one of them a small piece of text. Compared to professional translators, crowdsourced translation is considerably less expensive, and it can be significantly faster with good translation quality [76].

Crowdsourced translation was quickly adopted by some websites. Facebook[12] and Twitter[13] both use crowdsourced translation translate their user interface into

[8]It is hard to say that this type of translation falls into the category of crowdsourced translation because the unit of work is relatively large.

[9]http://www.yeeyan.org/

[10]http://news.meedan.net/

[11]http://gengo.com/

[12]http://developers.facebook.com/docs/internationalization/#translate

[13]http://support.twitter.com/articles/20169902-how-to-get-started-in-the-twitter-translation-c

other languages.

2.2.6 Translation with Monolingual People

Although both amateur translation and crowdsourced translation are (significantly) lower-cost and faster than professional translators, all these approaches use bilingual humans.

The biggest drawback with bilingual humans is their relative unavailability compared to the vast number of possible source and target language pairs. Finding translators for common language pairs (e.g. Spanish-English) may be easy, but finding even an amateur translator becomes difficult when just one of the languages involved is less common. For example, an English-to-Haitian-Creole translator is not easy to find[14]. How about, then, finding bilingual people to translate between two less common languages, for example between Croatian and Mongolian[15]?

To avoid the bilingual availability problem, researchers have made multiple attempts at performing translation with monolingual people. Translating with monolingual people offers the potential to recruit from a much larger population. Just to illustrate the difference in scale between bilingual and monolingual users: while Wikipedia currently has about 600,000 active English-speaking contributors, there are fewer than 900 users who have self-identified as (even amateur) translators [16].

[14]Drawing from my own experience, which is discussed later in Chapter 6.

[15]Needs for translation between these two languages do exist. In the International Children's Digital Library, there are books in Croatian, and the library has a sizable Mongolian-speaking user population.

[16]The number of contributors was taken from `http://stats.wikimedia.org/EN/`

Monolingual post-editing of machine translation output is a natural extension to machine translation. Post-editing is usually done with bilingual humans [1]. The bilingual post-editors are given machine translation output, and they revise machine translation output with the original text as reference. Monolingual post-editing replaces the bilingual post-editors with monolingual post-editors. The difference is that monolingual post-editors do not have access to the source sentence and thus must infer the original meaning. Koehn showed that monolingual post-editing alone, without knowledge of the source language, can improve translation quality [38]. Compare to bilingual post-editing, monolingual post-editing does not require bilingual skills and is thus and more scalable. It may also be less expensive because monolingual skills are less scarce.

The Linear B system [7] introduces tighter coupling between monolingual humans and machine translation. With the Linear B system, monolingual target language speakers are given segments in the target language proposed by the machine translation engine, and their task is to concatenate the segments into a fluent target sentence (Figure 2.4). Experiments with the Linear B system showed that it improved machine translation quality without bilingual people.

Monolingual post-editing and the Linear B system only use monolingual target language speakers. In a way, they are using the monolingual target language speakers' rich knowledge about their own language as language models for decoding.

There are also systems that involve both target language speakers and source

`TablesWikipediansContributors.htm`. The number of translators was taken from `http://en.wikipedia.org/wiki/Wikipedia:Translation#Finding_translators`

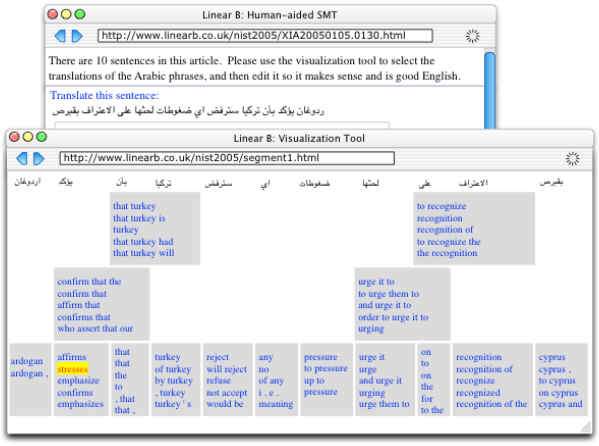


Figure 2.4: The Linear B user interface (taken from [7], Figure 2).

language speakers. Lemmatic machine translation [66][34] integrates machine translation with monolingual human editing in both rephrasing the source text (encoding) and inferring the translation (decoding). However, as its name suggests, source language speakers can only use word sequences that are already contained in the translation vocabulary. This design is consistent with the system's focus on using humans to help the machine obtain a passable translation. However, with this design, the system "will not yield fluent, grammatical sentences in the target language" [66].

Morita et al [50][51], as part of the Language Grid project [33], also proposed a monolingual translation protocol (referred to as "the Language Grid protocol" hereafter) which includes a monolingual source language speaker and a target language speaker (Figure 2.5).

The Language Grid protocol is a two-phase, bidirectional communication protocol between a monolingual source language speaker and a monolingual target language speaker. During the first phase, the target language speaker repeatedly re-

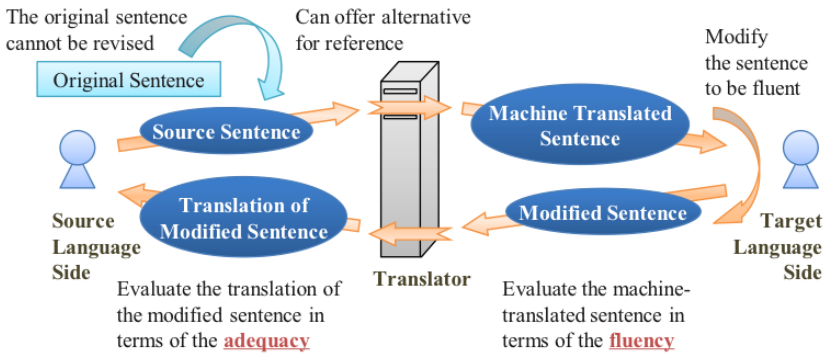


Figure 2.5: The Language Grid protocol, (taken from [51], Figure 14.2, page 219). Notice that the two loops on the source side ("can offer alternative for reference") and the target side ("modify the sentence to be fluent"), respectively.

quests a sentence-level paraphrase from the source language speaker (who knows the original sentence); when the target language speaker feels that he has a good understanding of the original meaning, the protocol then enters the second phase where the target language speaker repeatedly rephrases the translation, which is in turn back-translated and given to the source language speaker for confirmation. Morita et al [51] showed that this type of collaboration between the monolingual source language speaker and the monolingual target language speaker improved translation quality.

The crowdsourced monolingual translation protocol shares some significant elements in common with the Language Grid protocol[17], but it is significantly different in both the type of information exchanged between the source and the target language speakers, and synchronicity of the interaction between them. The crowd-

[17]The crowdsourced monolingual translation protocol was proposed independently in 2009.

sourced monolingual translation protocol is also designed to work with crowds from the beginning whereas the Language Grid protocol did not utilize crowdsourcing [51]. (More discussion about the protocol is in Chapter 3.)

In addition to all of the systems using monolingual humans without any knowledge of the source language, an interesting approach worth mentioning is Duolingo, a commercial system that uses language learners to translate online content (see Figure 2.6).[18] [19] Duolingo offers its users language courses for free. The users who start as monolingual, are given paragraphs at different difficulty levels to translate as exercises as they proceed through the courses. In terms of crowdsourcing, Duolingo solves the crowd availability problem by targeting a specific group (language learners) and by giving them the bilingual skills necessary to do the work. However, as discussed in Section 2.1, the crowdsourced monolingual translation protocol is aiming to solve the same problem by a different approach: combining crowds with different *existing* skills. Compared to Duolingo, the crowdsourced monolingual translation protocol can be applied more broadly to crowdsourcing problems in other domains, besides translation.

In terms of generating the final translation output, Duolingo uses voting to select the best translation candidate (similar to some systems in this dissertation). While voting is a standard method for aggregating output from human workers, it can be vulnerable to spamming or cheating, especially when the human workers

[18] `http://duolingo.com/`

[19] The crowdsourced monolingual translation was first published in April 2009. Duolingo was not in invited testing until November 2011.

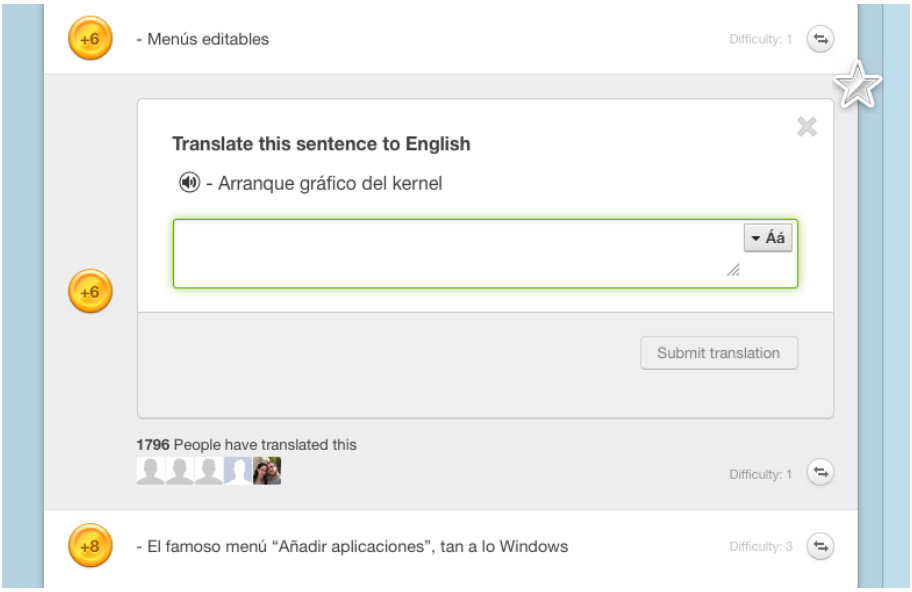


Figure 2.6: The Duolingo user interface for translating real-world web content as language learning exercises. One sentence in the list of sentences is opened for translation. The user interface also shows the people who have translated the same sentence.

have external incentive.

Finally, although little is known about Duolingo's post-processing mechanism for sentences translated (after voting), it should be fair to note that language learners' translation cannot be taken directly as the final output, since their language skills are still developing.

2.3 Summary

In this chapter, we can see that crowdsourced monolingual translation fits into the relatively unexplored space at the intersection of crowdsourcing and translation. In terms of crowdsourcing, it explores the combination of two crowds with different

skills. In terms of translation, it tries to solve the translation problem without bilingual people. In Chapter 3, I will discuss this protocol in detail.

Chapter 3

The Crowdsourced Monolingual Translation Protocol

This chapter describes a translation protocol based on the computationally-supported collaboration between two groups of monolingual people, each group speaking only one of the two languages involved (the source language or the target language, respectively). These two groups of people are *effectively monolingual* (because they may speak other languages), as opposed to bilingual translators who speak both the source language and the target language.

This protocol uses machine translation as an initial pass. After that, it creates a feedback loop between the source and the target language speakers who iteratively add redundancy to the translation so machine translation errors can be corrected. The feedback loop supports communication between the source and the target language speakers through two channels, a machine translation channel and an annotation channel. The iteration between these two crowds of monolingual people stops when there is evidence that it has reached sufficient translation.

This chapter first discusses the rationale behind building an iterative protocol with a feedback loop and choosing the two channels. A synthetic example is then shown to illustrate the iterative protocol at work, followed by detailed discussions about the protocol itself. A brief summary of all the systems that implemented this protocol is given at the end of this chapter.

An earlier version of this chapter was published in [24].

3.1 Protocol Overview: Supporting Monolingual Translation

3.1.1 Existing systems

Solutions to enable translation without bilingual people include fully automatic machine translation and hybrid solutions that combine machine translation and monolingual people.

Fully automatic solutions have been a major interest for research [47]. For the past decade, machine translation has improved greatly, and usable translation quality can be obtained by statistical machine translation systems between a number of language pairs. There are online machine translation systems [30][20] that offer fast and free general-purpose translation, and they are very helpful for casual translation needs, such as finding the correct link to click on a web page or getting the gist of a news story.

However, in use cases where high quality translation is preferred (for example, literary translation), machine translation alone does not suffice. Since machine translation can still be used as a reasonable first pass for those cases, there are some attempts to use monolingual people to compensate for the unreliable machine translation.

Monolingual post-editing of machine translation output is a natural extension to machine translation. Post-editing [1] is usually done with bilingual humans (post-editors) who revise machine translation output with the original text as ref-

erence. Compared to bilingual post-editing, or bilingual human translation without initial machine translation, monolingual post-editing does not require bilingual skills and is thus potentially less expensive and more scalable. A comparative study between post-editing and the crowdsourced monolingual translation protocol is given in Chapter 5.

There are also systems that extend beyond monolingual post-editing. The Linear B system [7] shows that monolingual target language speakers can help improve machine translation quality by selecting and concatenating the phrases proposed by the machine translation system. In this case, the monolingual target language speakers in effect serve as very high quality language models by applying their rich knowledge of the target language.

In addition to a target language speaker, Morita et al [50] (in a system developed independently and simultaneously as the crowdsourced monolingual translation protocol) added a monolingual source language speaker to the translation process and showed that monolingual source and target language speakers can improve translation quality by communicating with each other. They define a two-phase, bidirectional communication protocol between a monolingual source language speaker and a monolingual target language speaker. During the first phase, the target language speaker repeatedly requires a sentence-level paraphrase from the source language speaker (who knows the original sentence); when the target language speaker feels that he has a good understanding of the original meaning, the protocol then enters the second phase where the target language speaker repeatedly rephrases the translation, which is in turn back-translated and given to the source

language speaker for confirmation. The Morita system uses both the target language speaker's knowledge as the language model and the source language speaker's knowledge as a source of multiple paraphrased input sentences. (As we can see, in the Morita system, monolingual people communicate with two yes/no questions, and this is less informative than the annotation channel in my protocol, as discussed in Section 3.1.3.)

3.1.2 People, redundancy and monolingual translation

The existing systems (Linear B and Morita's) support for translation with monolingual people can be seen as adding monolingual people's knowledge as redundant information to the machine translation process to increase the likelihood that machine translation errors can be corrected.

The importance of redundancy in linguistic communication is well established. Redundancy can be characterized as the quantity of information (measured in bits) used in transmitting a message over and above the number of bits in the message itself [62]. Languages contain a variety of phonological, syntactic, semantic, and pragmatic mechanisms that help the listener narrow the hypothesis space for the intended message via redundancy. One common illustration of such constraints involves *rmvng ll th vwls frm th wrds nd shwng tht th rdr cn stll ndrstnd th sntnc* [63]. Noiseless data compression of natural language relies on the fact that linguistic redundancy exists [61]. On the other hand, the recoverability of information conveyed over an unreliable channel is improved by increasing redundancy [62]. In

linguistics communications, people are very good at recovering information with redundancy [10]. If we look at people who manage to communicate successfully in challenging circumstances—whether they are in a noisy bar, using a poor quality cell phone connection, playing with a young child, or talking to someone who does not speak their language very well—we find that people adapt to all of these situations through a combination of linguistic constraints, world knowledge, shared context, and clarification requests. Therefore, it is reasonable that adding humans to the translation process can help improve translation quality by recovering the original meaning from unreliable machine translation, even if they do not know both languages.

3.1.3 The protocol as a closed-loop system

In control theory, a system whose output is measured and compared against the controlling reference (the goal for which the system is controlled towards) is called a closed-loop system [53] (See Figure 3.1). The *feedback loop* in a closed-loop system is the path through which the output is fed back for the comparison. Compared to a system without the feedback loop (an "open-loop" system), a closed-loop system is less sensitive to internal and/or external disturbances ("noise") and has greater accuracy because of its self-correcting nature.

Translation systems that simply output the translation without checking its correctness against the source sentence are open-loop systems. Machine translation systems by themselves often belong to this category. Monolingual post-editing [1]

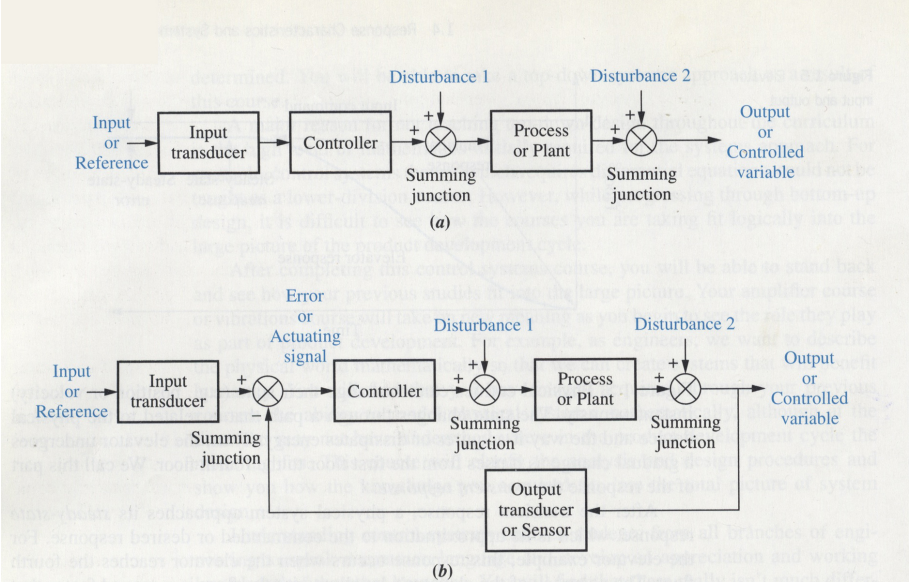


Figure 3.1: Block diagrams of control systems (From [53], Figure 1.6, Chapter 1.4): a) open-loop system; b) closed-loop system. Notice the feedback loop formed in the closed-loop system by comparing the output with the reference. With the feedback loop, a closed-loop system can correct for disturbances.

and the Linear B system [7] are also open-loop systems because translation produced by monolingual target language speakers is not compared to the source sentence within the systems. For open-loop translation systems, although the specific translation mechanisms can be improved to obtain high translation quality, errors produced within the system cannot be corrected.

Because machine translation systems have intrinsic noise (machine translation errors), a more reliable way to produce high-quality translation would be to introduce a feedback loop. The Morita system [50] can be seen as creating a feedback loop between the source language speaker and the target language speaker. The feedback loop in this case consists of two channels: the back-translation and the

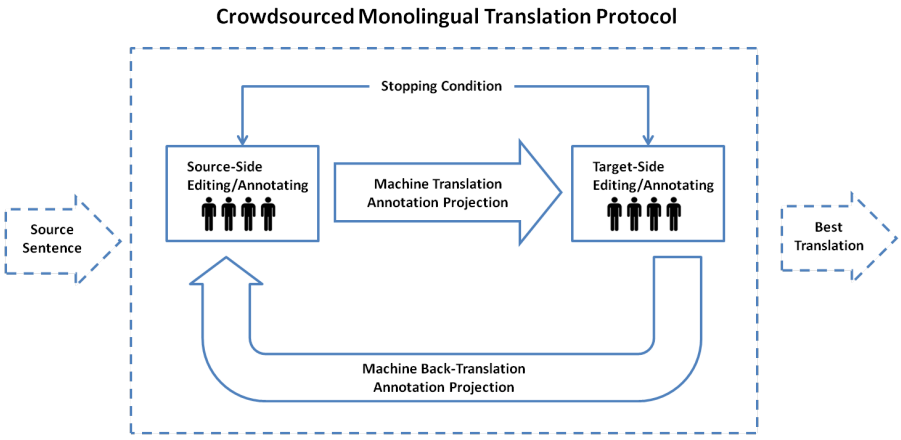


Figure 3.2: An overview of the crowdsourced monolingual translation protocol showing two crowds of monolingual people and the information flow between them. This protocol takes a source sentence as the input. With the protocol, the source language speakers and the target language speakers communicate and collaborate via a feedback loop formed by machine translation and annotation projection. Once the stopping condition is reached, the protocol outputs the best translation collaboratively generated by the two crowds.

yes/no questions about whether to end each phase.

In the protocol (see Figure 3.2) that I developed simultaneously with the development of the Morita system, I also use a feedback loop that uses machine translation as one of its communication channels. The major difference between this feedback loop and the Morita system is that my protocol feeds back more information by introducing a channel using language-independent annotations. Compared to the one bit of yes/no information in the Morita system, the annotation channel can convey more information and can reduce translation errors at a more fine-grained level (which I will discuss in more details in Section 3.3.2). The annotation channel is designed to decouple the communication between monolingual people from the

unreliable translation channel as much as possible. Unlike the translation channel, it does not translate text directly. Instead, it augments the text being translated by enabling users to annotate it.[1] Through these two channels in the feedback loop, monolingual people are involved in a closed-loop, iterated and restricted communication, the goal of which is to match the meaning of the translation to that of the original text.

The feedback loop has a stopping condition which relies on significant evidence that the matching of meaning has been reached. In different implementations of the protocol, this evidence can be implemented as 1) the explicit agreement between monolingual people on both sides or 2) the aggregated preference from both crowds of monolingual people. I will discuss the stopping condition in Section 3.2.3.

In the following sections, I will revisit the synthetic example shown in Section 1.2 to illustrate how the protocol improves translation quality through the feedback loop, and especially with annotations. After that, I will discuss the two channels in the feedback loop in more detail.

3.2 The Feedback Loop: Iteration between Monolingual Crowds

The synthetic example in Section 1.2 (see page 4) illustrates how the feedback loop helps monolingual people on both sides collaboratively identify mistranslated

[1]Nonetheless, one could argue that the understanding of non-textual information (such as pictures) is still dependent on cultural context and is thus language-dependent. However, such understanding is less dependent on language than language itself. For example, there are many cases where different cultures understand a picture in similar ways.

phrases, add more information to those phrases and eventually correct translation errors. In particular, the picture served as a language-independent annotation which enhanced communication between two monolingual crowds by decoupling it from unreliable machine translation.

In the feedback loop, the source sentence is first translated into the target language using machine translation. After the initial machine translation, the source language speakers and the target language speakers take turns to edit or annotate the translation (or the corresponding back-translation). In this way, the source language speakers and the target language speakers are engaged in a dialog which aims to improve the translation by correcting errors and to add redundant information so errors become easier to correct.

At each iteration of this dialog, monolingual people change the sentence in two ways: editing and annotating. Editing changes the text being translated (without changing the meaning), and annotating adds information to the text. Editing and annotating on both sides may look similar to each other, but they are quite different conceptually, as is discussed below in Section 3.2.1 and Section 3.2.2.

In addition to changing the translation (or the corresponding back-translation), monolingual people also have one important task which is to stop iterating via the feedback loop once high quality translation is obtained. In the illustrative example above, the iterations stopped once the Spanish speaker confirms that the back-translation matches the original meaning. In practice, this stopping condition is operationalized in different ways, as is discussed below in Section 3.2.3.

3.2.1 The role of target language speakers

The target language speakers represent the consumers of the translation because the two groups, albeit sometimes different, speak the same language. At a high level, the target language speakers' goal is to recover the original meaning from the current translation which may contain errors.

A straightforward way to do so is monolingual post-editing: editing the translation according to the inferred meaning and correcting any translation errors. This is very much like any user of an online machine translation engine (such as Google Translate or Babel Fish) does when reading imperfect translation from an unfamiliar language; it is also analogous to communicating in noisy environments or talking to an elementary speaker of one's native language. People gain various benefits from interacting with machine translation [17], and they are good at recovering the original message even when some information is missing [63]. Monolingual people are able to do so because humans have a very rich body of knowledge about the language they speak as well as a full range of contextual knowledge about the world. (In effect, they are very good language models.) Therefore, monolingual post-editing alone can recover the original meaning to some extent.

However, as discussed in Section 3.1.3, monolingual post-editing alone forms an open-loop system. As we will see later (Section 3.3.2.1), from the initial machine translation alone, the errors correctable by target language speakers can be limited. Therefore the crowdsourced monolingual translation protocol introduces a feedback loop by enabling the target language speakers to request more information be added

to the original sentence. The target language speakers can make such requests by identifying phrases that need annotations, in some cases along with the types of annotation needed. For example, the target language speakers can mark a phrase to indicate a possible translation error, or to annotate the phrase with a predefined question ("Is this phrase the name of a person?"). Their requests will be answered by source language speakers, resulting in increased redundancy in the sentence being translated. (Annotating is discussed separately later in Section 3.3.2.)

3.2.2 The role of source language speakers

The source language speakers know the intended meaning because they have the original sentence. At a high level, their goal is to confirm that the target language speakers have produced the correct translation (more discussion in Section 3.2.3). If the current translation is not correct yet, the source language speakers also act as the source of redundancy by adding more information to original sentence.

Redundancy can be added by minimally editing the back-translation so it matches the original meaning. This is in effect paraphrasing the original source sentence using the words in the back-translation. Every paraphrased source sentence is then translated using machine translation and given to the target language speakers. Paraphrasing the original sentence helps to add redundancy to the translation process, and using the words of the back-translation makes the paraphrase more likely to be translated correctly by the machine translation engine.[2] Existing research shows that people can perform these types of paraphrasing tasks quite

[2]Assuming machine translation engines in both directions were trained with similar data.

well: Post-editing [1] has been included as one of the translation practices for some time, although it does not explicitly carry the requirement of minimum edits; some human-aided metrics for machine translation evaluation, such as Human Translation Edit Rate (HTER [64]), do require human editors to make the minimum changes needed to capture the intended meaning of a reference sentence.[3]

In addition to providing textual redundancy which is sent through machine translation, source language speakers also respond to target language speakers' requests for annotations through the annotation channel. The annotation channel is an important feature of the translation protocol worth its own discussion, which is in Section 3.3.2.

3.2.3 Stopping condition

Iterations between the source and the target language speakers through the feedback loop stop once high-quality translation is reached. Every translation after being edited by the target language speakers is expected to be fluent and grammatically correct (by definition of the target language speakers' editing task). In this case, the problem of detecting high quality translation reduces to confirming with sufficient evidence that the current translation does carry the original meaning.

Such confirmation would be straightforward if the feedback channels were noiseless. In this case, the source language speakers could simply look at the latest back-translation and judge if the originating translation contains the correct

[3]In both cases, human editors are editing in the target language, but this does not prevent one to apply this type of tasks in the source language

meaning. In a system with unreliable ("noisy") machine translation, however, the correctness of the back-translation does not guarantee a correct translation (and vice versa).

The problem of confirming with unreliable feedback is well solvable with crowdsourcing systems. Many crowdsourcing systems aggregate solutions from human workers whose output cannot be verified with ground truth [8][45][72]. This is simply because solving those problems automatically is too difficult — if there existed an automatic way to generate ground truth, human workers would not have been needed in the first place. The crowdsourcing systems' solution to the confirmation problem, therefore, is to leverage their scale, or the "wisdom of crowds" [68]: One solution is to give the same task to many workers such that the correct answer is statistically the most likely [72]; another solution is to recruit additional workers as verifiers to reconfirm the correctness of the existing workers' output [45]; if an extra pre-screening process is feasible, then it is also possible to select a special group of "high quality" workers [8].

The crowdsourced monolingual translation protocol solves the confirmation problem in a similar way. In different systems that implemented this protocol, confirmation was operationalized as: 1) the explicit agreement between the source language speakers and the target language speakers, or 2) the translation (or corresponding back-translation) that received most votes from both the source language speakers and the target language speakers.

As in all the other crowdsourcing systems mentioned above, in theory, answer aggregation among crowds does not always generate the correct answer. In fact,

during the experiments (described in Chapter 4 and Chapter 5), there were cases when the translation process never reached high-quality translation. However, like all crowdsourcing systems, answer aggregation is a feasible way to reach the correct answer statistically, and it worked well in those experiments, too.

3.2.4 Synchronous versus asynchronous interaction models

Looking at the synthetic example (Section 1.2), it is natural to think about the monolingual translation protocol as a synchronous activity that involves two people from beginning to end in translating each sentence. However, modeling the protocol this way requires that at any given time 1) there are pairs of monolingual people, and 2) one pair of monolingual people work on one sentence from beginning to end. Such requirements can become inefficient when the protocol needs to scale up to large crowds, especially when 1) sizes of monolingual crowds differ, and 2) chunks of work for translating one sentence need to be distributed among many people to accelerate the translation process.

Moreover, since any step of the protocol can take some time as people think about their work — and of course because monolingual people from different sides may not be logged in at the same time, particularly across time zones — the protocol would be better modeled as an asynchronous activity, with tasks in the translation protocol not performed by the same pair of monolingual people, but rather distributed among a crowd of monolingual people. For example, a crowd of target language speakers and a crowd of source language speakers might step in and out

of the participant roles in Figure 1.1, with each person performing only one single task.

Distributing the translation of a sentence among many monolingual people runs the risk of losing some consistency in the translation. On the other hand, this more fine-grained distribution of human effort would have the advantage of learning from many individuals' perspectives. Distributing the translation process will also alleviate the problem of long iterations between the same pair of participants. In addition, units of work could be quite small [6], and thus it is likely to be easier to recruit monolingual people.

Both the synchronous version and the asynchronous version of the protocol were implemented and studied. A synchronous system, MonoTrans, is presented in Chapter 4; two asynchronous systems, MonoTrans2 and MonoTrans Widgets are presented in Chapter 5 and Chapter 7.

3.3 Two Channels of the Feedback Loop

The feedback loop is made of two channels: the machine translation channel and the annotation channel. The machine translation channel translates text in both directions, forming the basis for which annotations can be added on; the annotation channel, on the other hand, enables monolingual people to communicate and add redundant information in a language-independent manner. This section discusses the important properties of these channels.

3.3.1 The Machine Translation Channel: Machine Translation Quality

For the protocol, the quality of machine translation is a subtle issue: The protocol's improvement of translation quality is expected to be non-trivial only when machine translation quality is neither too low nor too high.

With extremely low-quality machine translation, the whole translation protocol would become hardly effective. Machine translation is the only representation of bilingual knowledge in the monolingual translation protocol. It is used not only to provide the initial translation, but also to translate edited texts between the source and the target language speakers. If machine translation quality is too low, it would not be able to pass sufficient information between the two sides, and the feedback loop would not be able to make effective comparison between current translation and the original meaning. Low machine translation quality would also result in frustration among the monolingual people. Studies of translation recommendation systems [21] have shown that human translators only find post-editing machine translation output more efficient (than translating on their own) when machine translation quality is at a high level (85% to 95%).[4] Although monolingual people involved in my translation protocol are not professional translators and thus may have different levels of tolerance, it is reasonable to assume that they also become frustrated when required to edit very low quality machine translation. In addition,

[4]The quality measurement here is different than what was used in experiments this dissertation reports.

as we will see in Section 3.3.2.2, the annotation channel also depends partly on machine translation. Therefore, machine translation quality cannot be too low.

On the other hand, if machine translation output is so high-quality that it only contains minor errors (more specifically, detectable-and-correctable errors discussed in Section 3.3.2.1), then the protocol would be less efficient than simply performing monolingual post-editing on the target side, since all translation errors would be easily corrected by target language speakers.

Therefore, the marginal gain in translation quality using the protocol is only nontrivial when machine translation is passable but not high enough for the monolingual target language speakers to post-edit. In practice, as of the time of this dissertation, the quality of current general-purpose machine translation systems is suitable to serve as the machine translation channel in the protocol.

3.3.2 The Annotation Channel: Reducing Translation Errors

The protocol also uses annotations to exploit the fact that increased redundancy leads to more successful communication. The annotation channel explicitly supports adding redundancy through annotations attached to phrases to increase the level of redundancy available to the monolingual people (especially the target language speakers), and this is because with increased redundancy, translation errors can become easier to correct.[5]

[5]More precisely, a "phrase" here means a sub-sentential sequence of words which may or may not be a grammatic phrase. For expressive ease, I will use "phrase" to refer to such sequences hereafter.

3.3.2.1 Types of translation errors

Motivated by error-correcting codes theory [57], I classify translation errors into three types, ordered by ease-of-correction:[6]

1. **Errors that are both detectable and correctable:** For example in the target sentence "Everybody has **hear** story about Cinderella" when the correct source meaning is "Everybody has **heard the** story about Cinderella". These are often grammatical errors that monolingual people can fix even without knowing the original thanks to linguistic redundancy.

2. **Errors that are detectable but not correctable:** As in "Everybody has heard the **history of** Cinderella" versus the correct meaning in "Everybody has heard the **story about** Cinderella". These are errors that native speakers can identify — clearly "history of Cinderella" is an incorrect translation of something — but cannot fix with confidence.

3. **Errors that are not detectable:** For example "Everybody **loves** the story about Cinderella" instead of "Everybody **has heard** the story about Cinderella." In these cases, a fluent and plausible sentence gives the monolingual target language speakers no reason to suspect an error has occurred.

As we have seen in the synthetic example (Section 1.2), adding annotations helps monolingual people communicate about these translation errors and turn harder ones into easier ones. For detectable-but-uncorrectable errors, for example, a target

[6]The examples are all in English for ease of exposition, but they are intended to illustrate sentences in the source and target languages.

language speaker receiving "Everyone has heard the history of Cinderella" might highlight the phrase "the history of", flagging the fact that an error has been detected even if it was not correctable given the available information. Simply highlighting the translation error makes it easier for the source language speaker to offer relevant clarifying information. For example, in Figure 1.1, the Spanish speaker saw the highlighting and believed the concept *historia* ("story") was mistranslated, so he then used a picture about "stories" to clarify. (Using pictures is a common way to help bridge the communication gap when linguistic communication is impaired or unavailable [39][49][78].) He could have also used paraphrases to indicate that *historia*, *cuento* ("tale"), *relato* ("story"), and *leyenda* ("legend") are conceptually similar words. Even imprecise translations of these words, together with the context, are likely to turn the detectable error "the history of Cinderella" into one that can be corrected. Similarly, annotating the source sentence may help turn undetectable errors into detectable errors. By linking pictures connected with hearing to the verb mistranslated as "love", the substitution of "love" for "hear" can be made detectable and possibly even correctable: A Spanish-English dictionary maps Spanish *oír* to English hear, which produces pictures in (English) Google image search that are likely to clarify the intended meaning.[7]

3.3.2.2 Annotation projection

The annotation channel depends on the ability to link annotation attached to part of a sentence in one language to the corresponding part of its translation in

[7]In this case, a search could be done directly in Spanish Google image search as well.

the other language (and vice versa). For example, if the source language speakers annotate the phrase "the story of Cinderella", the system links the annotation to the piece of the sentence that phrase was translated into, in order to convey that information back to the target language speakers. Linking is done by a technique called *annotation projection* [32][73].

Annotation projection is defined in [32] as using word alignments provided by machine translation engines and creating mappings between syntactic relations among phrases in a sentence and their counterparts in the sentence's translation. The protocol borrows this technique to attach annotations of a phrase to its translation. The annotation projection algorithm here is a direct parallel to the direct projection algorithm described in [32]:

- **one-to-one:** If a word w_E in the source sentence is aligned with a word w_F in the target sentence, then every $A(w_E)$, annotation of w_E, is also attached to w_f, written as $A(w_F)$.

- **one-to-many:** If a word w_E in the source sentence is aligned with words $w_{1F}, ..., w_{nF}$ in the target sentence, then for every $A(w_E)$, let $p_F = \bigcup_{i=1}^{n} w_{iF}$ be the phrase containing $w_{1F}, ..., w_{nF}$, the annotation is also attached to p_F, i.e. $A(p_F)$.

- **many-to-one:** If many words $w_{1E}, ..., w_{nE}$ in the source sentence are aligned with a word w_F in the target sentence, then for every annotation $A(w_{iE})$, the annotation is attached to the same target word, i.e. $A(w_F)$.

- **many-to-many:** It is decomposed into performing first one-to-many and

then many-to-one. A phrase in the target sentence $p_F = \bigcup_{i=1}^{n} w_{iF}$ takes all the annotations on all the corresponding words w_{iE} in the source sentence, i.e. for every $A(w_{iE})$, there is $A(p_F)$.

Although theoretically there can also be unaligned words, the machine translation engine used in the protocol's implementations aligns every word, so this case was not taken into account in those systems.[8]

As described in existing research [32][73], direct projection results are "quite noisy" [73]. However, like the verification problem discussed in Section 3.2.3, this problem can be addressed by using many workers to add redundancy. For example, a group of target language speakers can assess the same sentence and mark phrases they think were incorrectly translated; for every marked phrase that is projected back onto the source sentence, a group of source language speakers can give a paraphrase. Previous experiments [6] showed that even with direct projection, this crowd-based method of marking and paraphrasing improved translation quality over machine translation.

3.3.2.3 Information overload

One final question about annotations is that whether they are more distractive than useful. As to this concern, I am encouraged by the results obtained by Callison-Burch in the Linear B system [7]. In the Linear B system, monolingual target language speakers are presented with all available phrase-level translations accessible

[8]The engine is Google Translate Research API.

by an underlying statistical MT system and are required to select the sub-sentential parts to make the best translation. Monolingual users of the Linear B system demonstrated significant ability to capture the intended meaning among a plethora of alternatives (about five alternatives for every word in the sentence). Similarly, annotations generated through annotation projection can be seen as equivalent to candidate phrases in the Linear B system, and monolingual people may be well able to infer the intended meaning from a collection of annotations.

3.4 Brief Summary of Systems

In the next chapters, I will discuss three systems which implemented the crowd-sourced monolingual translation protocol: MonoTrans, MonoTrans2 and MonoTrans Widgets. (Before MonoTrans, I also ran a Wizard-of-Oz pilot study on the feasibility of the protocol.) While these systems all implemented the protocol's feedback loop with two channels, as explorations into the design space, each system implemented the protocol in a different way. For example, the stopping condition (Section 3.2.3) was implemented as explicit agreement in MonoTrans, and as voting in the other two systems; Following the discussion in Section 3.2.4, MonoTrans used a synchronous interaction model, and the other two systems used an asynchronous interaction model.

The monolingual people's tasks in those systems depend on the features implemented in each system. As a whole, user tasks in all systems are listed as the following. The source language speakers' task are:

- **Edit:** Edit and improve current translation.
- **Annotate:** Attach an annotation to a phrase in the current translation. Annotations include:
  - **Mark correct phrase:** Indicate that the phrase does not need improvement.
  - **Mark translation error:** Indicate that the phrase appears problematic in the target language.
  - **Ask a question with templates:** Use predefined templates to ask a question about the phrase. Questions include "Is this a person?" or "Is this a place?".
- **Vote:** Vote any translation candidate up or down.
- **Agree on stopping translation:** Propose to stop translation, or agree to such a proposal from the other side.

The target language speakers' tasks are:

- **Edit:** Edit and improve current back-translation.
- **Annotate:** Attach an annotation to a phrase marked problematic by the target language speakers. Annotations include:
  - **Attach Wikipedia link:** Attach a Wikipedia entry to explain the problematic phrase.
  - **Attach web link:** Attach a web URL to explain the problematic phrase.

  - **Attach picture:** Attach a picture to explain the problematic phrase.
  - **Rephrase a phrase:** Express the problematic phrase in a different way.
  - **Give a yes/no answer:** "Yes" or "no" in response to a question asked by the target language speakers.
  - **Give an answer with templates:** Use predefined templates to answer a question asked by the target language speakers. Templates include "This is a person" and "This is a place".

- **Vote:** Vote any back-translation up or down.
- **Agree on stopping translation:** Propose to stop translation, or agree to such a proposal from the other side.

Notice that this is the set of *all possible* user tasks, and some of them overlap because only one of the overlapping tasks were implemented in each specific system. For example, as discussed in Section 3.2.3, two different stopping conditions were implemented, but each system only implemented one of them. A comparison of the tasks and the stopping conditions implemented in the pilot study and the three systems is given below (Table 3.1).

Table 3.1: Protocol settings in different systems. These systems, to be discussed later in the dissertation, all implemented the crowdsourced monolingual translation protocol. However, they implemented the protocol in different ways discussed in this chapter. The iteration could be synchronous or asynchronous; the stopping condition could be an agreement between two sides or the best-voted-for candidate reaching vote threshold; the specific features included in the annotation channel and the amount of context shown were also different.

Name	Iteration	Stopping Condition	Annotation Channel						Context
			correct phrase	translation error	Q & A	Picture	Web Link	Rephrase	
Wizard-of-Oz	Synchronous	Mutual agreement	✓	✓	✓	✓	✓	✓	All
MonoTrans	Synchronous	Mutual agreement	✓	✗	✗	✓	✓	✗	Page
MonoTrans2	Asynchronous	Most votes	✗	✓	✗	✓	✓	✓	Page
MonoTrans Widgets	Asynchronous	Most votes	✗	✓	✗	✗	✗	✓	Sentence

MonoTrans and the Wizard of Oz pilot study were implemented and studied in 2009 [24]. MonoTrans2 was implemented and studied in 2010 [25]. The MonoTrans Widgets system was implemented and studied in 2011 [27].

3.5 Chapter Summary

This chapter described a crowdsourced monolingual translation protocol which is an iterative protocol to support translation between two crowds of monolingual people with unreliable machine translation. The protocol relies on the fact that human communication contains redundancy and supports communication between the source and the target language speakers by creating a feedback loop between them. The feedback loop uses machine translation and also augments machine translated texts with annotations attached simultaneously to corresponding parts of a sentence and its translation. In the next chapters, I will discuss three systems that implemented this protocol.

Chapter 4

MonoTrans: Synchronous Crowdsourced Monolingual Translation

This chapter discusses the first system that implemented the crowdsourced monolingual translation protocol. As described in Chapter 3, the protocol forms a feedback loop with two channels: the machine translation channel and the annotation channel. Chapter 3 described several ways to implement the protocol, and this chapter starts by establishing the protocol's feasibility through one implementation.

Before implementing a system, I first conducted a Wizard of Oz experiment to understand general feasibility of the protocol and some related design issues. In the Wizard of Oz experiment, a system was simulated by using a bilingual human wizard as the annotation channel. The results of the Wizard of Oz experiment were promising, so I built MonoTrans, the first fully automatic system and used it to further study issues revealed by the experiment. This chapter discusses both the Wizard of Oz experiment and the MonoTrans system.

An earlier version of this chapter was published in [24].

4.1 A Wizard of Oz Experiment

A Wizard of Oz Experiment [36] is an experiment in which human subjects interact with a computer system that works as if it were autonomous, but which is actually being operated or partially operated by an unseen person ("wizard"). With

Wizard of Oz experiments early in the design cycle, the designer of a system can involve users and study their interaction with a simulated version of the system and therefore understand its potential and limitations before implementing it.

In order to understand the crowdsourced monolingual translation protocol before implementing a system, I conducted a Wizard of Oz Experiment to explore the following questions:

- **Feasibility:** Can the monolingual translation protocol correct machine translation errors?
- **User perception:** How do the source and target language speakers understand this protocol? Can they use the system well?
- **Annotation type:** What kind of annotation should be supported in the annotation channel?

The Wizard of Oz experiment used a bilingual "wizard" who was fluent in both the source and the target languages. During the experiment, the wizard used a machine translation engine to translate the sentences edited by the monolingual participants.[1] More importantly, the wizard performed annotation projection by attaching an annotation of a phrase to the corresponding phrase in the other language. During the experiment, every translation (or back-translation) from participants was translated by machine translation first, annotated by the wizard, and finally passed to participants on the other side.

[1]The translation engine was Google Translate.

Translation was carried out by the machine translation engine. If the bilingual wizard also provided the translation, the translation would have been perfect, and the collaboration between monolingual participants to correct translation errors would have been unnecessary. Annotation projection was performed by the wizard. Using a wizard guaranteed high-quality annotation projection because the positions of the projected annotations were correct [2].

4.1.1 Implementation of the translation protocol

As discussed in Chapter 3, there are many ways to implement the protocol. The simulated system in the Wizard of Oz experiment implements features summarized here.

The system uses a synchronous interaction model of the protocol. For each sentence being translated in this system, the target language speakers and the source language speakers take turns to annotate and edit the current translation or back-translation. Editing on different sides has different objectives: The target language speaker's objective is to edit the sentence into a grammatical one; the source language speaker's objective is to edit the back-translation so it carries the original meaning. In addition to editing, monolingual participants also annotate phrases in the translation or back-translation. Overall, the simulated system contains most of the tasks for monolingual participants included in Section 3.4 (page 53), so each

[2] In the case of a severe machine translation error, there might be no corresponding phrase in the other language. The experiment's plan for this case was that the wizard would also provide the translation. However, this did not happen during the experiment.

type of annotation can be tested. The target language speaker tasks are:

- **Edit:** Edit and improve the current translation.
- **Annotate:** Attach an annotation to a phrase in the current translation. Annotations include:
  - **Mark phrase as correct:** Indicate that the phrase does not need improvement.
  - **Mark translation error:** Indicate that the phrase appears problematic in the target language.
  - **Ask a question with templates:** Use predefined templates to ask a question about the phrase. Questions include "Is this a person?" or "Is this a place?".
- **Agree on stopping translation:** Propose to stop translation with success or failure, or agree to such a proposal from the other side.

The source language speaker tasks are:

- **Edit:** Edit and improve current back-translation[3].
- **Annotate:** Attach an annotation to a phrase marked problematic by the target language speakers. Annotations include:
  - **Attach Wikipedia link:** Attach a Wikipedia entry to explain the problematic phrase. If this type of annotation is used, the corresponding entry

[3]As discussed in Chapter 3, this is in fact adding a paraphrased version of the source sentence.

in the target language is attached to the target side[4].

  - **Attach picture:** Attach a picture to explain the problematic phrase.
  - **Rephrase a phrase:** Express the problematic phrase in a different way.
  - **Give a yes/no answer:** "Yes" or "no" in response to a question asked by the target language speakers.

- **Agree on stopping translation:** Propose to stop translation with success or failure, or agree to such a proposal from the other side.

The stopping condition for translating each sentence is that both sides agree to stop. Compared to the description in Chapter 3 where the stopping condition only relies on source-side confirmation of high-quality translation, this condition gives the target language speakers a chance to opt out of an unsuccessful translation process.

4.1.2 Experiment

The experiment was conducted in August 2009. The task in the experiment was to translate a page in a children's picture book from French to Turkish. I chose a children's book as the translation material because it matched our initial motivation

[4]This feature is especially helpful if translation of the linked page exists. For example, one might annotate the English word Cinderella with the link to `http://en.wikipedia.org/wiki/Cinderella`, which a) identifies the name's translations in a variety of languages, increasing the likelihood that a target language speaker with limited knowledge of other languages might recognize it, and b) includes pictures that help increase shared context.

of translating children's books in the ICDL[5]. A picture book was chosen because the background picture provided monolingual participants on both sides with initial shared context.

There were two participants and one wizard in the experiment. The participants were *effectively monolingual* with respect to the experimental task (using only French and Turkish respectively). They spoke French and Turkish respectively, and the wizard spoke both French and Turkish. All three of them also spoke English. I recruited English-speaking participants so they could also communicate with the experimenter (myself) in English as necessary.

I chose French and Turkish as the working languages to show the potential of our system to work with languages distant from each other. The choice of languages was also based on the availability of a trilingual wizard.

Before the experiment, the participants were informed that they were using a new system to translate collaboratively with another participant, but they were not informed that there was a wizard. The participants and the wizard used Etherpad, an online shared text editor service [6] to simulate shared editing. The source language speaker and the target language speaker each shared a different editor instance with the wizard. In each shared editor, the monolingual speaker only saw the translated (or back-translated) sentences in their language.

[5]The International Children's Digital Library, `http://childrenslibrary.org`. See Chapter 1 for more discussion.

[6]Etherpad was acquired by Google. Information about Etherpad can be accessed now at `http://etherpad.com/`.

All the sentences being translated were listed in the editor. Although the translation of each sentence was synchronous, to save time, participants were told to work on other sentences while waiting for a response.

To annotate a phrase, the source/target language speaker would first highlight the phrase and then give the highlight an index number; the annotation content would then be added to the end of the document, using the same index. Annotation projection was performed by the wizard. For each annotated phrase, the wizard would highlight the corresponding phrase in the other editor, give the highlight the same index number and put the annotation content at the end of the document, using the same index number. The content of the annotation would be translated if necessary.

During the experiment, the participants did not communicate with each other outside of the system. The wizard only performed annotation projection and did not communicate with the participants otherwise. The wizard was asked to think out loud to inform the experimenter about the translation process.

4.1.3 Experiment results

The general feasibility of the system was promising. The participants used the system to collaboratively translate five sentences. After the experiment, the bilingual wizard also evaluated the translations. According to the wizard, two out of the five sentences were translated correctly, one sentence had a minor error, and two sentences had translation errors that the participants did not correct. Although

the sample size was obviously too small to draw strong conclusions, the process did demonstrate the potential of the protocol to begin with low quality automatic translations and make progress toward high quality outcomes.

The experiment also showed good user perception of the protocol. The participants understood and followed the iterative translation process quite well.

Regarding annotations, the participants used all types of annotations offered. The tasks they performed most often were "marking a phrase as correct" and "marking a translation error". During the post-experiment interviews, both monolingual participants commented that these two tasks were the most helpful to direct their efforts to phrases most in need of revision. The task "rephrasing a phrase" was not used explicitly; however, participants frequently edited the whole sentences to avoid phrases they described as "the machine translation is not good at" which became evident over iterations of the protocol in the form of repeated errors. Pictures and Wikipedia links were also used.

Choosing a picture book as translation material also turned out to be helpful. Both participants commented that the page's background picture helped to define a "frame" of possible meaning for the sentences.

4.1.4 Translation speed

The major issue revealed by the Wizard of Oz experiment was that it took a long time to translate the sentences. The participants used the system for about one and a half hours and collaboratively translated five sentences. During the experi-

ment, the system was barely interactive for the monolingual participants on both sides as they had to frequently wait for responses from the other side.

The main reason, as it appeared in the experiment, was that the wizard had to do a significant amount of translation and annotation projection. For each annotation, the wizard not only had to find its best projected location (in the other language), but also had to sometimes change it into the other language (e.g. find the Wikipedia entry in the target language). Implementing the automatic annotation projection algorithm (Section 3.3.2.2) would solve this problem.

Another reason for the low translation speed was the synchronous interaction model with which users on each side needed to wait for work on the other side to finish. This was especially frustrating for the source language speaker because there was a non-trivial waiting period at the beginning of each sentence translation process before the target language speaker finished working on the initial machine translation. During this period, the source language speaker was notified that the translation process had started, but he had no task to perform. As later studies conducted with MonoTrans revealed, the synchronous interaction model was a major bottleneck for translation speed. Therefore, in the successors of MonoTrans, MonoTrans2 (Chapter 5) and MonoTrans Widgets (Chapter 7), the synchronous interaction model was replaced by the asynchronous interaction model.

4.2 MonoTrans: The First Automatic System

4.2.1 Motivation

The Wizard of Oz experiment showed promising results about the crowdsourced monolingual translation protocol. In particular, it showed that the annotation channel helped monolingual people on both sides to collaboratively correct machine translation errors. However, the simulated system had very low translation speed. This needed to be addressed in a fully automatic system.

I built the first fully automatic system, MonoTrans, to address the translation speed problem and to further study the effectiveness of the crowdsourced monolingual translation protocol.

4.2.2 Implementation of the translation protocol

Like the simulated system in the Wizard of Oz experiment, MonoTrans also uses a synchronous interaction model in which the target language speakers and the source language speakers take turns to edit and annotate the current translation or back-translation. This model creates a single thread of translations and back-translations for each sentence. Although a single translation thread is a potential bottleneck for translation speed (see Section 4.1.4), it is easier to maintain and easier for the monolingual users to understand.

MonoTrans contains the following tasks for monolingual people. The target language speaker tasks are:

- **Edit:** Edit and improve current translation.
- **Annotate:** Attach an annotation to a phrase in the current translation. Annotations include:
  - **Mark phrase as correct:** Indicate that the phrase does not need improvement.
- **Agree on stopping translation:** Propose to stop translation with success or failure, or agree to such a proposal from the other side.

The source language speaker tasks are:

- **Edit:** Edit and improve current back-translation[7].
- **Annotate:** Attach an annotation to a phrase marked problematic by the target language speakers. Annotation include:
  - **Attach web link:** Attach a web URL to explain the problematic phrase.
  - **Attach picture:** Attach an picture to explain the problematic phrase.
- **Agree on stopping translation:** Propose to stop translation with success or failure, or agree to such a proposal from the other side.

Compared to the simulated system (page 60), MonoTrans does not have the task "rephrase a phrase" because this feature was not used much during the Wizard of Oz experiment; It does not have the task "mark translation error" because this feature overlaps with marking phrases as correct; Instead of the task "attach

[7]As discussed in Chapter 3, this is in fact adding a paraphrased version of the source sentence.

Wikipedia links", users of MonoTrans can attach any web links; MonoTrans does not support the tasks "ask a question with templates" and "give a yes/no answer" due to its development time frame.

Annotation projection (described in Chapter 3) in MonoTrans is performed using word-level correspondence information (word alignments) provided by the machine translation engine [47]. The machine translation engine in MonoTrans is the Google Translate Research API[8]. On the other hand, the publicly available Google Translate API[9] did not provide word alignments necessary for annotation projection.

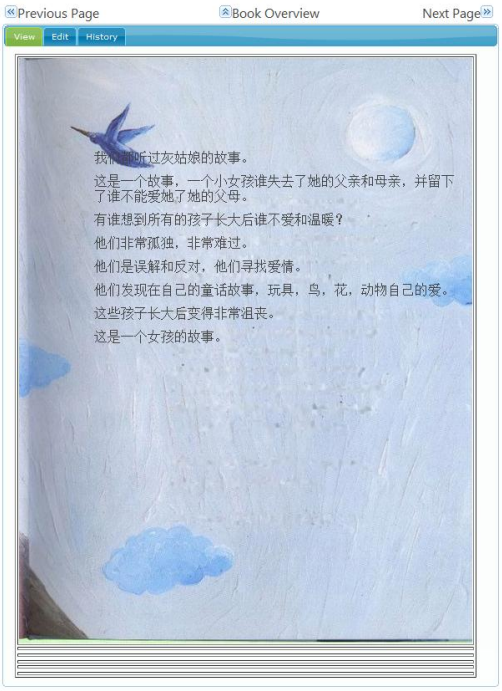


Figure 4.1: The MonoTrans system user interface in viewing mode. The book being translated is *The Blue Sky*. It is being translated from English to Chinese. The page shown here is on the target language (Chinese) side. The UI is showing translated sentences in Chinese.

[8] `http://research.google.com/university/translate/docs.html`

[9] At the time of MonoTrans' development.

Like the simulated system, the stopping condition for each sentence's translation is that one monolingual person on each side agrees to stop translating (with success or failure).

4.2.3 User interface

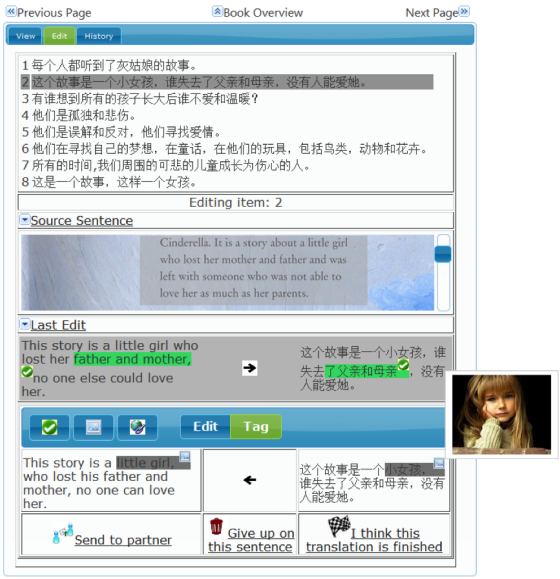


Figure 4.2: The MonoTrans user interface in editing mode. Like 4.1, the book *The Blue Sky* is being translated from English to Chinese. The parts of the user interface from top to bottom: 1) page navigation buttons; 2) mode selection tabs; 3) sentence list; 4) source sentence; 5) previous edit; 6) rich editor; 7) action buttons. Annotating is presented as adding a "tag" in the rich editor.

MonoTrans has a web-based user interface structured with the task of book translation in mind, based on the driving need for translation from the International Children's Digital Library project[10] which has more than 4,000 books in 61 languages that we would like to have translated [3][59]. The MonoTrans interface has pages

[10]The International Children's Digital Library is at `http://www.childrenslibrary.org`.

corresponding to the book pages being translated, and sentences within the same page can be viewed together to form a context and help each others' translation.

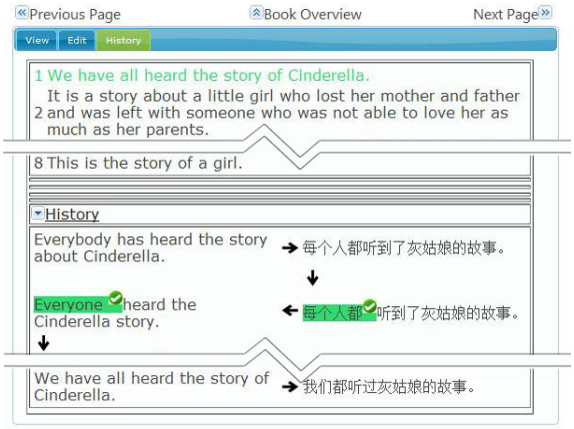


Figure 4.3: The MonoTrans user interface in History Mode. The interface is showing a list of sentences on top, and the detail-on-demand translation thread on the bottom.

Every translation page in MonoTrans has three modes: the viewing mode (Figure 4.1), the editing mode (Figure 4.2) and the history mode (Figure 4.3). These modes correspond to three phases of MonoTrans users' work flow.

When users enter a translation page, it is in the viewing mode (Figure 4.1). The viewing mode shows users an overview of the page in its current best state, with all its sentences overlaid on top of the background picture (if there is one). On the target side, the viewing mode shows the latest translation hypotheses of all sentences in the page; on the source side, it shows the corresponding back-translations. A sentence is highlighted if it needs the current side's action. For example, on the source side, a sentence is highlighted when its latest translation has just been edited by the target language speakers and needs the source language

speakers' confirmation on the back-translation.

In the viewing mode, users can navigate to other pages using navigation buttons on the top of the page. They can also change into the other two modes by clicking the corresponding tabs on the top of the page.

When users decide to make some changes on the current page, they click on a tab so the page enters the editing mode in which users can edit and annotate sentences. When the page enters the editing mode (Figure 4.2), sentences are presented as a list in the upper part of the page. When users select a sentence in the sentence list, the page shows its most up-to-date translation hypothesis with the original source sentence in context, the previous edit in the other language and a rich editor where the sentence can be edited and annotated. To annotate a phrase in the rich editor, users first highlight a phrase and then use pop-up dialogs to select the desired annotation content.

After editing and/or annotating, users send the new revision of the translation or back-translation to the other side using "send to partner" button. They can also propose to end the translation process when it is satisfactory using the "I think this translation is finished" button or give up current translation process and start over using the "Give up on this sentence" button.

Each page also has a history mode where the threads of translation can be viewed (Figure 4.3). In the history mode, sentences within the page are also shown in a list. When a sentence is selected by the users, the detail-on-demand display below the list shows its translation history as a thread going back and forth between both sides. Each step in this translation thread shows the edits and the annotations at

that step. Showing a translation thread like this enables users to see the accumulated context created by all the previous revisions and corresponding annotations.

4.2.4 Experiment

I conducted an experiment with MonoTrans in a lab setting. In the experiment, participants used MonoTrans to translate a children's book from Russian to Chinese. Although Chinese and Russian are commonly spoken and locates geographically close to each other, they still make good experimental candidates because they are very different from the perspective of linguistic typology.[11]

Two Russian speakers and four Chinese speakers formed four pairs to use MonoTrans. (One Russian speaker participated three times with different content and partners.) The participants were effective monolingual: they were all native speakers of one language and had no knowledge of the other. They were all computer literate, and they were all fluent in English. While most of the participants were computer science students or researchers, none of them studied machine translation, and none of them were familiar with the details of this project, nor were they linguists or linguistic students.

During the experiment, participants sat in the same room but far enough so they could not see each other's screen or hear each other. They were allowed to communicate with the experimenter in English in a manner such that the partner would not be able to hear. They did not use MonoTrans to write anything in English.

[11] Again, the choice of languages also depended on the availability of speakers at the time of experiment.

Each pair of participants spent an hour together. While they were told to work freely on any sentence (including those that were incompletely translated by previous participants), each pair of participants chose to work on a different set of pages. In total, participants worked on 6 pages (a total of 44 sentences) and finished translating 28 of the 44 sentences[12].

4.2.5 Evaluation Paradigm

After the experiment, the sentences translated by MonoTrans were evaluated by human evaluators for translation quality. Since the evaluation paradigm employed here was also used in all the experiments throughout this dissertation, this section specifically discusses the evaluation paradigm with human evaluators.

4.2.5.1 Evaluation protocol

Evaluators were hired to evaluate every sentence translated. All evaluators were unfamiliar with the project. Two types of evaluators were hired: native speakers of both the source and the target languages, and native speakers of the target languages. I tried to hire bilingual evaluators whenever possible, and monolingual target-language-speaking evaluators were only hired when bilinguals were too difficult to hire.

Every sentence translated was evaluated by all evaluators. The sentences were anonymized so the evaluator did not know which sentences were generated by which systems. Each evaluator gave two scores to every sentence: fluency and accuracy. To

[12]Recall the definition of finishing a translation. It has to be agreed upon by both participants.

prevent the evaluators' fluency judgment from being confounded by the accuracy judgment, the evaluators were asked to first read the translation alone, rate its fluency, and then rate the translation's accuracy by comparing to the reference. (More discussions about the scores are in Sections 4.2.5.2 and 4.2.5.3.)

Bilingual evaluators and monolingual evaluators used different references to rate a translated sentence's accuracy. Bilingual evaluators were given the original text as reference; monolingual evaluators were given the ground truth translation as reference. Other than the experiment with Haitian Creole for which ground truth translation was distributed with the data sets (Chapter 6), ground truth translations were generated by a professional translation firm.[13]

4.2.5.2 Translation fluency

Fluency evaluation followed the standard scoring procedure described in Dabbadie et al [12]. A sentence's fluency indicates how natural it is in the target language alone (or how much the sentence matches a perfect language model in the target language).

In the experiments, two fluency scoring scales were used. The first, a four-point scale described in Dabbadie et al [12], was used to evaluate fluency with MonoTrans (Section 4.2.6):

1. **Unintelligible:** nothing or almost nothing of the translation is comprehensible.

[13]Lengua Translation, at `http://lenguatransaltion.com`. The translation firm was not hired to perform translation quality evaluation directly because their service was too expensive.

2. **Barely intelligible:** only a part of the translation (less than 50%) is understandable.

3. **Fairly intelligible:** the major part of the translation passes.

4. **Very intelligible:** all the content of the message is comprehensible, even if there are errors of style and/or of spelling, and if certain words are missing, or are badly translated, but close to the target language.

In all experiments that followed, I used a five-point scale in which the score 5 was given to sentences that did not contain any errors:

1. **Unintelligible:** nothing or almost nothing of the translation is comprehensible.

2. **Barely intelligible:** only a part of the translation (less than 50%) is understandable.

3. **Fairly intelligible:** the major part of the translation passes.

4. **Intelligible:** all the content of the translation is comprehensible, but there are errors of style and/or of spelling, or certain words are missing.

5. **Very intelligible:** all the content of the translation is comprehensible. There are no mistakes.

The five-point fluency scale was modified from the original four-point scale [12] to add a finer comparison between translations containing minor mistakes and those containing no mistakes.

A fluent translation does not necessarily carry the original meaning. (For example, imagine a translation mechanism that translates every sentence into "John loves Mary.".) Therefore, translation accuracy was also evaluated.

4.2.5.3 Translation accuracy

Accuracy evaluation also followed the standard scoring procedure described in Dabbadie et al [12]. A translation's accuracy indicates how much it carries the meaning in the source text. An accurate translation is not necessarily fluent. (For example, "Me no speak English." is an accurate translation of "No hablo inglés.")

The human evaluators judged each sentence's accuracy by giving a score between 1 and 5:

1. None of the meaning expressed in the original sentence is expressed in the translation.
2. Little of the original sentence meaning is expressed in the translation.
3. Much of the original sentence meaning is expressed in the translation.
4. Most of the original sentence meaning is expressed in the translation.
5. All meaning expressed in the original sentence appears in the translation.

A brief summary of the evaluations performed by human evaluators is given in Table 4.1:

Two automatic evaluation metrics, BLEU and TER, were also used in some experiments. They are discussed in Section 6.3.2 (page 117).

Table 4.1: Summary of human evaluation in experiments.

Experiment	Chapter	Evaluator	Fluency Scale
MonoTrans	4	Bilingual	4-point
MonoTrans2 (ICDL)	5	Bilingual	5-point
MonoTrans2 (Haitian SMS)	6	Monolingual	5-point
MonoTrans Widgets	7	Bilingual	5-point

4.2.6 Experiment results

After the experiment, the sentences translated by MonoTrans were evaluated for translation quality by a professional translator. Each sentence was given a score for its fluency and another score for its accuracy.

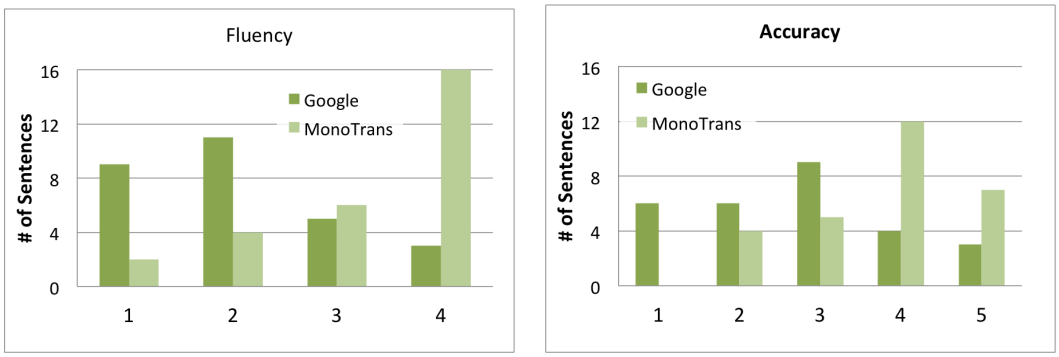
Table 4.2: Distribution of fluency scores (top) and accuracy scores (bottom). Each column shows the number of sentences receiving the score.

Fluency		1	2	3	4	Total
Google		9	11	5	3	28
MonoTrans		2	4	6	16	28

Accuracy	1	2	3	4	5	Total
Google	6	6	9	4	3	28
MonoTrans	0	4	5	12	7	28

As for the results (Table 4.2 and Figure 4.4), 16 of the 28 sentences translated with MonoTrans were rated as fully fluent (fluency score 4 in Figure 4.4(a)) and 19 sentences of the 28 were rated as mostly or fully accurate (accuracy scores 4 or 5 in Figure 4.4(b)). There were also incomplete translations with very high quality, but only completed translations were included in the results.

The results showed an obvious shift in translation accuracy (Figure 4.4(b)). The accuracy scores were coarsely categorized so that scores 1 and 2 represented



(a) Fluency Distribution

(b) Accuracy Distribution

Figure 4.4: The distributions of fluency and accuracy scores for MonoTrans (compared with Google Translate). Note the accuracy distribution: MonoTrans output has more sentences with scores 4 and 5 than the output from Google Translate.

low quality and score 4 and 5 represented high quality, and there was a drop in the number of bad accuracy scores from 12 to 4 out of 28, and an increase in good accuracy scores from 7 to 19 of 28 — roughly a factor of 3 in each of the desirable directions. In addition, the number of completely inaccurate machine translation outputs (score 1, none of the meaning preserved) dropped from 6 to 0. This showed that the protocol was helping the target language speakers understand at least some of the meaning even when the original machine translation output quality was so low that the target language speakers had very little to infer the original meaning from.[14]

On the other hand, the improvements in fluency were to be expected given the target language speakers' editing task. The fact that the fluency scores were not perfect might seem unexpected given the instructions, but I believe this was due to

[14]This discussion was originally authored by my advisor Philip Resnik and published in [24].

natural variation in human judgment about fluency.

I also observed promising anecdotal results. Although MonoTrans had some remaining usability issues, all the participants correctly understood the monolingual translation protocol. According to the participants, the target language speaker's job was to "make the best educated guess" and the source language speaker's job was to "guess if the partner has made the correct guess". The correct understanding allowed them to collaborate quickly. For example, two pairs of participants (out of four pairs) successfully translated their first sentence in five minutes. The percentage for successful translation was also promising. On every page, more than half of the sentences were successfully translated.

Compared to the simulated system in the Wizard of Oz experiment, fully-automatic annotation projection in MonoTrans obviously improved the translation speed greatly. The translation speed in this experiment was 28 sentences in four hours (during which four pairs of participants each worked for an hour) or approximately seven sentences per hour per pair of participants. This speed was about five times faster than the Wizard of Oz experiment[15].

Despite its improvement over the simulated system, MonoTrans still had a rather low translation speed. Since fully automatic annotation projection was implemented in MonoTrans, it became obvious that the synchronous interaction model was the root cause. One solution to this problem is to turn to the asynchronous interaction model discussed in Section 3.2.4. In the next chapter, I will present a

[15]I did not measure the number of words translated per hour in the Wizard of Oz experiment or this experiment.

new system that uses the asynchronous interaction model.

4.3 Summary

This chapter presented a Wizard of Oz experiment and the MonoTrans system. Before MonoTrans, a Wizard of Oz experiment was conducted during which annotation projection was simulated by a human wizard. The Wizard of Oz experiment implied that the protocol was feasible, although it also showed problems with poor interactivity because of its speed. After obtaining promising results from the Wizard of Oz experiment, I built MonoTrans, the first system that implemented the crowdsourced monolingual translation protocol. MonoTrans further confirmed the protocol's feasibility and showed quality improvement over machine translation alone.

However, there was still room for improvement in terms of translation speed and interactivity. In the next chapter, I will discuss MonoTran2, a new system that implemented the asynchronous version of the monolingual translation protocol.

Chapter 5

MonoTrans2: An Asynchronous System

This chapter discusses MonoTrans2, the second system that implemented the crowdsourced monolingual translation protocol. MonoTrans2 used the asynchronous interaction model described model in Section 3.2.4.

MonoTrans (Chapter 4) confirmed the feasibility of the crowdsourced monolingual translation protocol. However, even after MonoTrans streamlined the translation process, its users still reported that the translation process felt "too long". Therefore, the goals of MonoTrans2 were: 1) to increase the system's throughput; and 2) to improve the user experience. In order to reach these goals, MonoTrans2 used the asynchronous interaction model. Changing from the synchronous interaction model in MonoTrans to the asynchronous interaction model, MonoTrans2 encouraged simultaneous participation from more monolingual people and enabled studies with more monolingual participants. The studies showed that MonoTrans2 can obtain not only statistically significant quality improvement over machine translation, but also significant improvement over monolingual post-editing.

In this chapter, I discuss the motivation of the asynchronous interaction design and its details, the implementation of MonoTran2, the evaluation of its translation quality and a comparative study between MonoTrans2 and post-editing.

An earlier version of this chapter was published as [25].

5.1 Synchronous and Asynchronous Interaction Models

The previous system, MonoTrans, used a synchronous interaction model in which monolingual people on different sides took turns to edit or annotate the current translation or back-translation. This model created a single thread of translations and back-translations for each sentence with alternating input from each side. Such a single thread was easy for monolingual users to understand because every input was built on top of the previous one; the corresponding data structure was also easy to maintain in the system.

However, this single-threaded synchronous model created problems for MonoTrans' interactivity and throughput. The system was barely interactive since at any time only one user could add to the thread (by editing or annotating) and all other users trying to contribute to the same thread had to wait for their turn. To avoid excessive waiting, participants of previous experiments were instructed to work on multiple sentences in parallel. While this alleviated the interactivity problem to some extent, it was merely a workaround because users could not focus on contributing to sentences that they chose – for example going through the sentences in order.

In MonoTrans2, I used the asynchronous interaction model (described in Section 3.2.4) to address this problem with MonoTrans. The single-threaded interaction model was replaced with multiple threads of translations for each sentence, which enabled multiple users to participate simultaneously without waiting. I introduced translation candidates to represent the simultaneously-edited translations and back-

translations. With multiple translation threads related to the same sentence, I also changed the stopping condition from user agreement (that two users on both sides agree to stop translation) in MonoTrans to voting (that most users favor a translation candidate) in MonoTrans2.

5.2 System Design

5.2.1 Translation candidates in multi-threaded translation

In MonoTrans2, editing takes place in parallel: monolingual people on both sides can edit any translation or back-translation in parallel with each other. The asynchronous translation process in MonoTrans2 is explained in Figure 5.1. Each original sentence in the source language is first translated by machine translation into the initial candidate in the target language. Target language speakers then edit the existing translation candidates. Each edit on the target side generates a new translation candidate. Once generated, the translation candidates (including the initial one generated by machine translation) are back-translated into the source language and presented to the source language speakers. Source language speakers in turn edit the back-translations. Each edit on the source side generates a sentence-level paraphrase of the source sentence. The paraphrases are translated into the target language and presented to target language speakers as translation candidates for another round of editing.

There are two types of translation candidates. A candidate generated by target language speakers (by editing an existing translation) has the edited target

text and its back-translation; a candidate generated by source language speakers (by paraphrasing an existing back-translation) has the paraphrase, its translated target text and the target text's back-translation. Annotations are only projected between target texts and the originating source texts (which the target texts are translated from); votes are casted on candidates' target texts and back-translations.

The stopping condition for each multi-threaded sentence translation in MonoTrans2 is different from MonoTrans (Section 4.2.2). In MonoTrans, the stopping condition is represented by user agreement, and the best translation is the latest candidate. In MonoTrans2, the translation process needs to identify, among multiple translation threads, a candidate which qualifies as the final translation. MonoTrans2 allows users to vote candidates or their back-translations up or down. The qualifying candidate is then operationalized as the most-favored candidate which has undergone a certain number of edits on both sides[1].

5.2.2 Monolingual tasks

MonoTrans2 contains the following tasks for monolingual people. The target language speaker tasks are:

- **Edit:** Edit and improve the current translation.
- **Mark translation error:** Indicate that a phrase appears problematic in the target language.
- ***Vote:*** Vote any translation candidate up or down.

[1]In the experiments, the number of edits was five.

The source language speaker tasks are:

- **Edit:** Edit and improve current back-translation[2].
- **Annotate:** Attach an annotation to a phrase marked problematic by the target language speakers. Annotations include:
  - **Attach web link:** Attach a web URL to explain the problematic phrase.
  - **Attach picture:** Attach a picture to explain the problematic phrase.
  - **Rephrase a phrase:** Express the problematic phrase in a different way.
  - ***Give explanation with templates:*** Highlight a phrase and use the predefined templates to give an explanation. Templates include "This is a person" and "This is a place".
- ***Vote:*** Vote any back-translation up or down.

During the design of these tasks, a key goal was to eliminate the need for users to interact synchronously. For example, in the Wizard of Oz experiment (Section 4.1.1, page 60), target language speakers had a task "ask questions with templates" with which they inquired about the phrases they needed clarification, and source language speakers answered those questions. This design created a tension for casual users who used the system only once on the target side, because they either sent questions for which they would never see an answer, or received answers to questions they had not asked. To avoid this problem, this functionality was redesigned so that target language speakers only mark phrases that need clarification

[2]As discussed in Chapter 3, this is in fact adding a paraphrased version of the source sentence.

(without asking a specific question) and source language speakers see which phrases (in the corresponding source sentence) were confusing and choose the clarification type and content (the task "give explanation with templates").

Because MonoTrans2 uses an asynchronous interaction model, the target language speakers and the source language speakers also have the task "vote" instead of the task "agree to stop" in MonoTrans.

The machine translation engine in MonoTrans2 is the Google Translate Research API[3].

5.2.3 Data structure

MonoTrans2 has a data structure designed with the task of book translation in mind. Each book being translated by MonoTrans has multiple *book translations*. Book translations contain pages, which in turn contain sentences. Sentences in MonoTrans2 include both the original sentence from the book and all translation candidates between the book translation's language pair.

This data structure can also be adapted for translation of other documents such as Wikipedia entries or short text messages, as is shown later in Chapter 6.

5.2.4 User interface

MonoTrans2's user interface also closely mirrors a collection of books. Users perform monolingual tasks on translation pages which correspond to book pages being translated. To direct monolingual users' effort to the pages that need more

[3] `http://research.google.com/university/translate/docs.html`

work, each book translation has a task selection page that shows a summary of tasks on each page.

For quality control, there are user accounts with MonoTrans2. Guests can view all the book translations, but only registered users can edit or annotate sentences. MonoTrans2 also uses user profiles to encourage more contribution (see Section 5.2.4.3). The following sections discuss these user interface features in more detail.

5.2.4.1 Translation page

MonoTrans2 users mainly interact with translation pages (Figures 5.2 and 5.3) to perform monolingual translation tasks. Each translation page corresponds to one book page being translated. It contains a list of all sentences within the book page and overlays the list on top of the page's background picture (if there is one)[4].

Sentences on the translation page have two modes: an overview mode (Figure 5.2) and a detail mode (Figure 5.3). The overview mode shows a sentence's current best translation candidate (or its back-translation) and the number of tasks related to the sentence. A sentence in the overview mode can be clicked and expanded into the detail mode which shows a list of all its translation candidates (or their back-translations). Users can use the controls in the detail mode to vote each candidate (or its back-translation) up or down, annotate the candidate (or its back-translation) or add a new candidate (or a paraphrased source sentence).

Each translation page has only one sentence in the detail mode. When the

[4]Many books in ICDL are picture books, so their pages have background pictures.

page is first accessed, the first sentence is shown in the detail mode; when a sentence is expanded into the detail mode, the previous open sentence collapses into overview mode.

The sentence list uses number badges to indicate tasks that need attention. In the detail mode, a badge with number "1" is placed next to any task users can perform. In the overview mode, a badge with the total number of related tasks is placed next to each sentence.

In addition to the sentence list, translation pages also contain navigation controls (on top of the page) for the users to navigate among translation pages, go to the overview page or the task selection page (described in Section 5.2.4.2). Next to the sentence list, contextual help messages about current tasks on the page are shown.

5.2.4.2 Overview page and task selection page

The overview page and the task selection page direct users to the translation pages. Once users enter MonoTrans2 (whether with their accounts or as guests), they are first shown the overview page (Figure 5.4(a)) which lists all ongoing book translations in the users' language. When users click on a book translation, they are then shown the task selection page (Figure 5.4(b)). The task selection page is designed to prevent users' efforts from being dispersed among all the pages (and leaving many pages incomplete). It displays a bar chart of the *neediness* of all pages in the book. A page's neediness for monolingual work is a score defined as the

following: A completed page does not need more work, so its neediness is zero; for any incomplete page, its neediness is the number of sentences that are completed normalized by its total number of sentences. On the task selection page, users can click on a bar in the bar chart to go to the corresponding page.

5.2.4.3 User accounts

MonoTrans2 includes user accounts to maintain records of user activities, and these records are also used to encourage more contribution from the users. MonoTrans2 shows a summary of a user's contribution on the user's profile page (see Figure 5.4(c)). The profile page shows the numbers of each type of tasks the user performed and an activity score which is the sum of the user's all task submissions. To make active users more visible, MonoTrans2 also shows on its home page a list of users with the highest activity scores (see Figure 5.4(d)).

5.3 Evaluation of MonoTrans2

I evaluated MonoTrans2 by conducting a translation experiment[5] in which monolingual people used MonoTrans2 to translate five children's books[6] selected from ICDL's collection. In the experiment, participants worked on translating four Spanish books into German and one German book into Spanish. All translations were from the language in which the book was originally published.

Participants were recruited from a database of ICDL volunteer translators,

[5]In August 2010.

[6]intended reader's age 6-9

soliciting people who spoke German or Spanish but not both. Sixty (60) fluent Spanish speakers and 22 fluent German speakers participated. In four days, participants worked on 162 sentences (the books contained 242 sentences in total).

After the experiment, two fluently bilingual people unfamiliar with the project were recruited as paid evaluators to assess the translation quality on all five books. They evaluated the fully automatic output of Google Translate (as a baseline) and the output of MonoTrans2 (using Google Translate as the translation channel). The systems were anonymized as Systems A and B, and the evaluators were not told which outputs came from which system. The sentences were presented in random order. For each translation in the target language paired with its corresponding source sentence, the evaluator rated the translation's fluency and accuracy on a 5-point scale. The scale for fluency was:

1. **Unintelligible:** nothing or almost nothing of the translation is comprehensible.

2. **Barely intelligible:** only a part of the translation (less than 50%) is understandable.

3. **Fairly intelligible:** the major part of the translation passes.

4. **Intelligible:** all the content of the translation is comprehensible, but there are errors of style and/or of spelling, or certain words are missing.

5. **Very intelligible:** all the content of the translation is comprehensible. There are no mistakes.

The scale for accuracy was:

1. None of the meaning expressed in the original sentence is expressed in the translation.

2. Little of the original sentence meaning is expressed in the translation.

3. Much of the original sentence meaning is expressed in the translation.

4. Most of the original sentence meaning is expressed in the translation.

5. All meaning expressed in the original sentence appears in the translation.

The fluency and accuracy scales were taken from a standard rating procedure [12]. The five-point fluency scale was modified from the original four-point scale [12] to add a finer comparison between translations containing minor mistakes and those containing no mistakes. To prevent the evaluators' fluency judgments from being confounded by their accuracy judgments, evaluators were asked to first read the translation alone, rate its fluency, and then compare the translation to the original to rate its accuracy.

Table 5.1 and Figure 5.5 summarizes the results. Unsurprisingly, MonoTrans2 produced large gains in fluency compared to machine translation alone. This improvement in fluency (Figure 5.5(a)) was to be expected given the instructions, as was the heavy skew toward top fluency. Indeed, anything except a top score in fluency would seem unexpected given the instructions, but (just as in Section 4.2.6) it could be a result from the natural variation in human judgment.

Table 5.1: Distribution of fluency scores (top) and accuracy scores (bottom) by evaluator. Each column shows the number of sentences receiving that score. B1 and B2 are bilingual evaluators. (See also Figure 5.5)

Fluency		1	2	3	4	5	Total
B1	Google	2	8	69	28	55	162
	MonoTrans2	4	7	6	14	131	162
B2	Google	5	52	55	25	25	162
	MonoTrans2	3	11	11	22	115	162

Accuracy		1	2	3	4	5	Total
B1	Google	6	33	38	23	62	162
	MonoTrans2	2	7	6	5	142	162
B2	Google	5	52	55	26	24	162
	MonoTrans2	4	10	11	21	116	162

The shift in accuracy was more notable (Figure 5.5(b)): using MonoTrans2, the peak of the accuracy distribution was shifted from 3 to 5.

To study the results' statistical significance, I ran four two-tailed paired t-tests between scores of MonoTrans2 and scores of Google Translate for both fluency and accuracy for each bilingual evaluator (Table 5.2). I also ran χ^2 tests for the scores (both for individual evaluators, and for the evaluators in aggregate). The p values were well under .001 (Table 5.3). These results showed that MonoTrans2 using only monolinguals significantly improved translation fluency and accuracy over Google Translate.

Table 5.2: T-test p values for fluency and accuracy scores. B1 and B2 are bilingual evaluators.

Evaluator	Fluency	Accuracy
B1	6.3×10^{-16}	3×10^{-19}
B2	5×10^{-27}	6×10^{-27}

Table 5.3: χ^2 F values for fluency and accuracy scores. B1 and B2 are bilingual evaluators. ($DOF = 4$)

Evaluator	Fluency	Accuracy
B1	89.4	85.1
B2	115	115
Both	192	192

Table 5.4 conveys this experiment's bottom-line results more strikingly. On the very conservative criterion that a translation output is considered high quality only if both bilingual evaluators rated it a 5 for both fluency and accuracy, Google Translate produced high quality output for 10% of the sentences, while MonoTrans2 improved this to 68%. The most notable result was the comparison between machine translation and MonoTrans2: a dramatic improvement in the production of high quality translations, without requiring any human bilingual expertise. These results suggested MonoTrans2 could potentially convert 68% of bilingual translators' time to validation rather than full translation, but the role of those bilinguals would remain necessary.

Table 5.4: Number of sentences with maximum possible fluency and accuracy. Number of sentences, $N = 162$.

	Google Translate	MonoTrans2
Sentences with fluency=5	21 (13%)	112 (69%)
Sentences with accuracy=5	17 (10%)	118 (73%)
Sentences with *both*=5	17 (10%)	110 (68%)

Overall, the experiment showed that MonoTrans2 can improve translation quality over machine translation alone. Machine translation as a baseline, however, is rather low, so a comparison between MonoTrans2 and post-editing is given next

in Section 5.5

5.4 Effectiveness of Annotation Projection

With many annotation types defined, MonoTrans2 is a good platform to study the effectiveness of annotation projection (Section 3.3.2.2 on page 50) in the crowdsourced monolingual translation protocol.

In the experiment, participants generated 1,071 translation candidates. They generated fewer annotations compared to the translation candidates. The target language speakers highlighted 284 phrases in the translation candidates, indicating that those phrases might be translation errors; the source language speakers responded to 218 of the 284 phrases marked as translation errors, resulting in 218 annotations, including pictures, paraphrases and explanations using predefined templates.

The distribution of annotations is given in Table 5.5. Paraphrase was the annotation type mostly used.

Table 5.5: The distribution of annotations used in the ICDL experiment.

Type	Number
Picture	15
Paraphrase	172
Explanation with templates	31

These annotations provided a good data set to answer the following questions:

- Did annotations improve quality?
- For every annotation type, did annotations of this type improve quality?

In MonoTrans2, all annotations related to the same sentence are visible to the users simultaneously. Therefore, once an annotation is generated, it may affect later translation candidates even if the candidates belong to other translation threads (of the same sentence). For this study, I defined quality improvement introduced by an annotation as the quality difference between the best translation candidate generated before the annotation and the average quality among translation candidates generated after the annotation.

Translation quality was measured with an automatic metric, TER (Translation Error Rate [64]). TER is an error metric for machine translation that measures the number of edits required to change a system output into one of the references. TER scores are percentages. Lower TER scores represent better translation quality. Unlike previous experiments, human judgments were not used due to the high volume of translated candidates and the time frame of this study.[7] To calculate TER, professional translation was used as ground truth (as described in Section 4.2.5.1 on page 74).

Overall, quality improvement introduced by each annotation was calculated as Algorithm 5.1:

I then conducted a paired t-test between each pair of (q_{before} and q_{after}) (TER scores before and after annotation). I also conducted a paired t-test for each type of annotation. The results are shown in Table 5.6.

For annotations as a whole, the statistical significance showed that annota-

[7]Another common metric, BLEU, was not used because it is used to evaluate quality at the document level.

Algorithm 5.1 Calculating quality before and after annotation

function QUALITYBEFOREANDAFTER(a)
  $t \leftarrow a.timeStamp$
  select candidates c where $c.timeStamp < t$ into list $C1$
  select from $C1$ candidate c_{best} with the best (lowest) TER score
  $q_{before} \leftarrow TER(c_{best})$
  select candidates c where $c.timeStamp \geq t$ into list $C2$
  $q_{after} \leftarrow mean(TER(c \in C2))$
  return (q_{before}, q_{after})
end function

Table 5.6: Paired t-test results.

Type	TER Difference	Significance
Picture	-9.6%	$p < 0.1$
Paraphrase	-9.2%	$p < 0.005$
Explanation with templates	-2.1%	NS
All	-8.4%	$p < 0.005$

tions did improve translation quality. Paraphrase was the most effective type of annotation, consistent with the fact that it was also the mostly used. Explanations with templates were not effective. A possible explanation is that the predefined templates did not provide monolingual participants with a chance to add new clarifying content.

Of course, this analysis is still very rough due to the interaction design of MonoTrans2. The improvement of quality might have simply resulted from participants being exposed to previous translation candidates. For a more precise study, a control condition in which no annotations are used may be needed to isolate the effect of annotations.

5.5 Comparison to Post-Editing

In all previous studies (in Chapter 4 and Section 5.3), the systems' translation quality was compared with that of machine translation. While machine translation certainly established a baseline for the crowdsourced monolingual translation protocol, quality improvement over this baseline is not very surprising because all the systems used machine translation as an initial pass. A more informative comparison, therefore, would be related to approaches that also use human knowledge to improve machine translation.

This section presents a comparative study between MonoTrans2 and post-editing [1]. In this study, I compared MonoTrans2 against both monolingual post-editing and the more standard bilingual post-editing. In addition, I also investigated the bilingual post-editing effort needed to bring all MonoTrans2 output to high quality.

The conditions compared were:

- Bilingual post-editing of MonoTrans2 output (**MonoTrans2-B**)
- Bilingual post-editing of Google Translate output (**Google-B**)
- Monolingual post-editing of Google Translate output (**Google-M**)
- MonoTrans2 output, no post-editing (**MonoTrans2**)
- Google Translate output, no post-editing (**Google**)

In addition to **MonoTrans2** itself and **Google** as the baseline, two post-editing approaches **Google-B** and **Google-M** were included. Finally, **MonoTrans2-**

B was included to investigate the bilingual post-editing effort needed to bring MonoTrans2 output to high quality.

The same set of children's books (Section 5.3) were used as the data set. These books contained 242 sentences in total, and the output from both MonoTrans2 and Google Translate collected in the previous experiment (Section 5.3) was also reused (each set contained 162 sentences, the other sentences were not worked on by MonoTrans2 users).

Five monolingual people post-edited the Google Translate output; three bilingual people post-edited both the Google Translate output and the MonoTrans2 output. The monolingual post-editors were asked to edit the first-pass translation by Google Translate without the source sentence as reference; the bilingual post-editors were asked to make edits given the original sentences in the source language. In every condition, every sentence was edited by one person. Although this might have introduced between-editor variance, it was closest to how sentences had been edited in MonoTrans2 and therefore made the post-edited sentences more comparable with MonoTrans2 output.

Two native bilingual evaluators (different from the post-editors) were then hired independently to evaluate the fluency and accuracy of the sentences in all five conditions (so that sentences in all conditions were evaluated by the same evaluators).

The distributions of scores (aggregated for both evaluators) are shown in Figure 5.6 on page 108.

To further investigate the statistical significance of the differences shown, I ran

one-way repeated measures analysis of variance (RM-ANOVA) tests for the scores (see Tables 5.7 and 5.8). For every translated sentence, the average fluency and accuracy scores between the two evaluators were calculated, and a RM-ANOVA test was then run on the fluency and accuracy scores respectively, with the scores (matched by original sentence) as the dependent variables and the condition as the independent variable.

Table 5.7: Result of RM-ANOVA.

	F	p
Fluency	33.4	$< 2 \times 10^{-16}$
Accuracy	33.39	$< 2 \times 10^{-16}$

I then ran post-hoc Tukey tests (see Table 5.8) for pairs of conditions that were adjacent in terms of fluency and accuracy (in Figures 5.6(a) and 5.6(b)). The results showed that 1) MonoTrans2 was significantly better than monolingual post-editing at improving accuracy; and that 2) monolingual post-editing did not significantly improve translation accuracy over machine translation output.

The accuracy results (see Table 5.8, bottom) showed a statistically significant difference between the accuracy of MonoTrans2 output (**MonoTrans2**) and that of monolingual post-editing output (**Google-M**). On the contrary, there was no significant difference between the accuracy scores from monolingual post-editing output (**Google-M**) and machine translation output (**Google**). This suggested that monolingual post-editing did not improve accuracy.

Regarding fluency (see Figure 5.6(a) and Table 5.8, top), MonoTrans2 and both bilingual post-editing conditions (**Google-B** and **MonoTrans2-B**) had the

Table 5.8: Result of post-hoc Tukey HSD Test between pairs of conditions. The average score improvement shows the improvement of condition 2 over condition1. For example, MonoTrans2's average accuracy score is 0.30 points higher than that of Google-M's. (Significance codes: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$, 'NS' indicates that the effect was not significant.)

Condition 1	Condition 2	Avg. Score Improvement	Significance
Google-M	Google	0.23	***
MonoTrans2	Google-M	0.19	**
Google-B	MonoTrans2	0.09	NS
MonoTrans2-B	Google-B	0.01	NS

Condition 1	Condition 2	Avg. Score Improvement	Significance
Google-M	Google	0.06	NS
MonoTrans2	Google-M	0.30	***
Google-B	MonoTrans2	0.16	*
MonoTrans2-B	Google-B	-0.03	NS

most sentences rated as highly fluent (score 5 in Figure 5.6(a)). These results were not surprising because all three conditions involved editing by target language speakers, whether they were monolingual or bilingual. It was unexpected, however, that monolingual post-editing of machine translation output (**Google-M**) did not generate as many fluent sentences as the previous three. One possible explanation is that since monolingual post-editors were unable to infer the original meaning from poor machine translation, they were somewhat hampered from post-editing some sentences into fluent ones.

To understand the amount of bilingual post-editing effort needed to turn MonoTrans2 output into "perfect" translation, I counted the number of sentences that were rated as highly fluent (score 5) and highly accurate (score 5) by both evaluators and normalized them by the total number of sentences that were processed by MonoTrans2 (see Table 5.9). (This criterion was the same as the last row of

Table 5.4, Section 5.3.)

Table 5.9: Percentage of high quality results (Fluency=Accuracy=5 by both evaluators).

System	Percentage of high-quality sentences
Google	22.84%
Google-M	24.07%
MonoTrans2	41.36%
Google-B	43.83%
MonoTrans2-B	44.44%

There was a difference of roughly 3% between MonoTrans2 output and MonoTrans2 output with bilingual post-editing. This result was different (and in a sense more optimistic) compared to the 68% shown in Table 5.4 (Section 5.3), because both MonoTrans2 output and bilingual post-edited sentences underwent evaluation, whereas in the previous evaluation, only MonoTrans2 output was evaluated. This result also implied that MonoTrans2 output was in fact much closer to bilingual post-edited sentences than the previous evaluation implied[8].

5.6 System Throughput and User Experience

The initial goals for developing MonoTrans2 were: 1) to increase the system's throughput; and 2) to improve the user experience. Regarding system throughput, MonoTrans2's throughput was not directly comparable to that of MonoTrans, be-

[8]One should also notice, however, the big difference between the percentages of high-quality sentences in the two evaluations (i.e. 68% in Section 5.3 versus 41% here). Further investigation showed that this difference was due to a much stricter bilingual evaluator in this study compared to more lenient evaluators in the previous one.

cause MonoTrans2 used the asynchronous interaction model whereas MonoTrans used the synchronous interaction model. A rough estimation of translation speed[9] showed that MonoTrans2 translated roughly 800 words per day during the experiment, a speed a third to a half of professional translators[10].

To understand the user experience with MonoTrans2, I elicited subjective reactions from our monolingual translation participants. In the 15 written comments, the greatest concern was that ICDL might simply publish the translations created through our process without bilingual review; as ICDL volunteers, these participants were deeply committed to attaining bilingual-translator quality (or in their words, "perfect translation"). In follow-up correspondence, their concern was resolved once they understood that in the real-world ICDL use case, the translation generated by MonoTrans2 would not be published without bilingual validation.

On the other hand, user motivation was still a problem with MonoTrans2. MonoTrans2 was originally designed for sustained use, but few users returned after the experiments. In Chapter 7, I will discuss a new user interface design to address this issue.

[9]There were 20 words per typical sentence in the dataset, and the experiment lasted for four days.

[10]A typical professional translator's speed is 1,000 to 2,500 words per day. This information was taken from Translia, at: `http://www.translia.com/translation_agencies/`.

5.7 Summary

In this chapter, I discussed MonoTrans2, a system that implemented the crowdsourced monolingual translation protocol with an asynchronous interaction model. With MonoTrans2, I was able to conduct experiments with ICDL volunteers at a larger scale. A comparative study of translation quality between MonoTrans2 and post-editing showed that MonoTrans2 output was not only better than machine translation alone, but also better than monolingual post-editing. It also implied that the effort required for a bilingual to post-edit MonoTrans2 output to a level comparable to an bilingual translation is small.

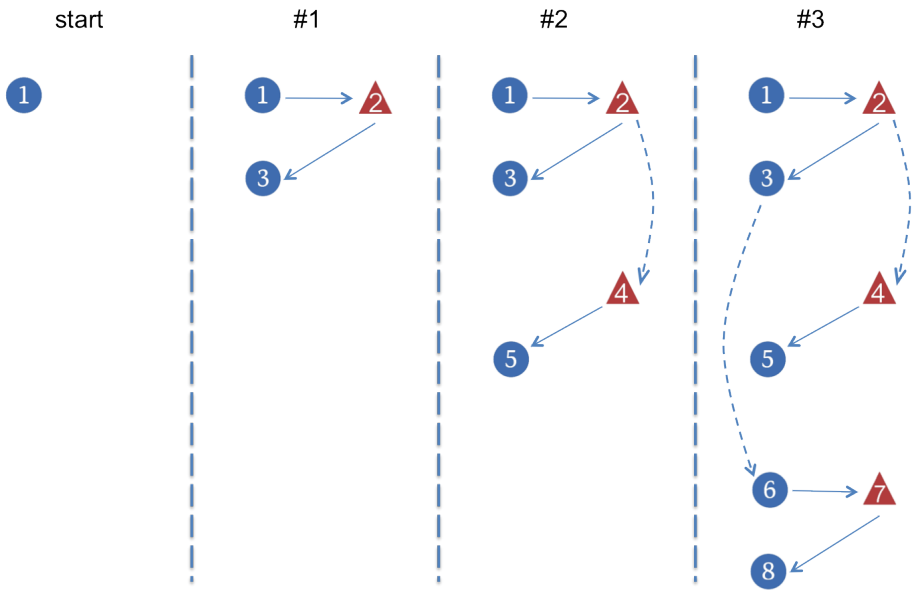


Figure 5.1: An example of the candidates with MonoTrans2's asynchronous editing process. Numbered circles represent source language texts; numbered triangles represent target language texts. Solid arrows represent passes in the machine translation engine; dashed arrows represent edits by monolingual participants. The process starts with the original sentence ("1"). At step #1, the original sentence is translated by MT into a candidate("2"); the candidate is also back-translated into a back-translation ("3"). At step #2 that follows, candidate "2" is edited by target language speakers into a new candidate "4"; "4" is back-translated into "5". (Note that there is no corresponding originating source text.) At step #3, source language speakers edited the back-translation "3", which generated a paraphrase "6", its translation "7", and the back-translation of "7" ("8"). Annotations are projected between "1" and "2", "6" and "7"; votes are casted on "2", "3", "4", "5", "7" and "8". Note that annotations on "4" are possible but unlikely, since "4" is generated by target language speakers and is likely to be fluent.

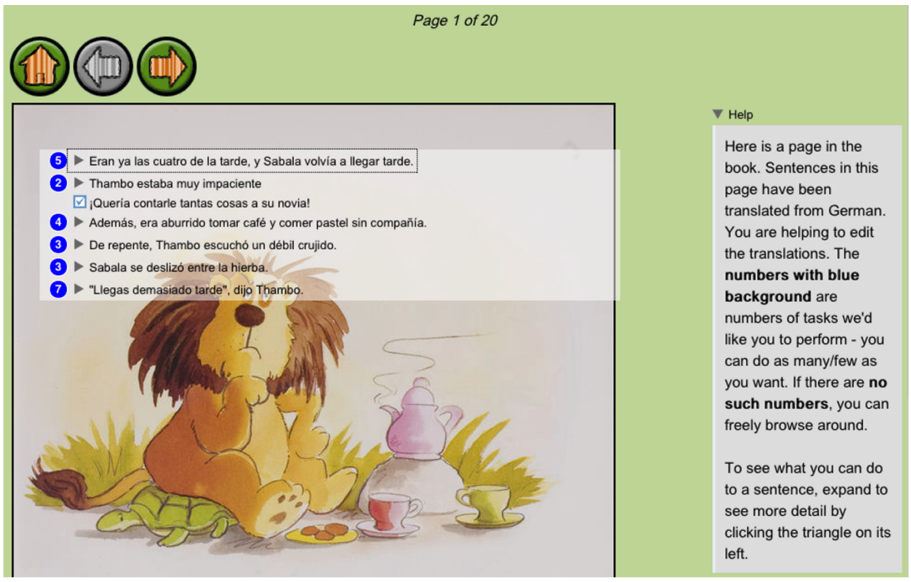


Figure 5.2: Translation page. The interface consists of a list of sentences overlaid on top of the background picture (middle), the navigation buttons (top) and the contextual help messages (right).

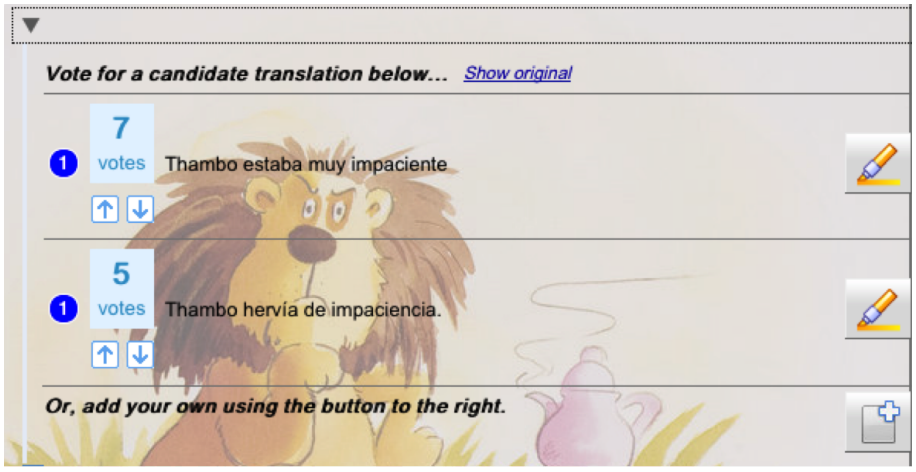
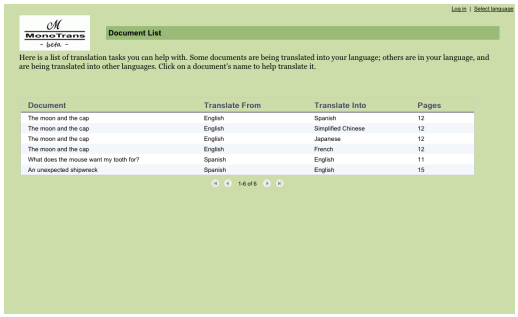
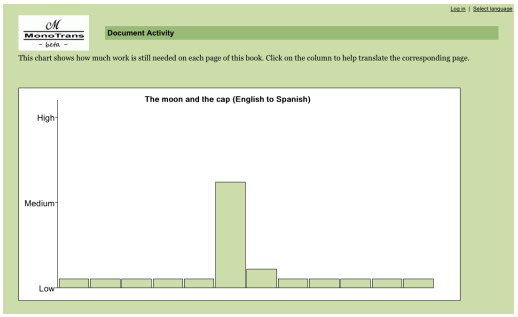


Figure 5.3: Detail mode of a sentence in MonoTrans2's translation page (target side). There are two candidates in this sentence. Number badges indicating user tasks are placed next to the voting buttons for each candidate (on the left). Users can also use the buttons to the right of each candidate to highlight part of the candidate as a translation error (in a separate popup window), or use the "add candidate" button at the bottom to add a new candidate.

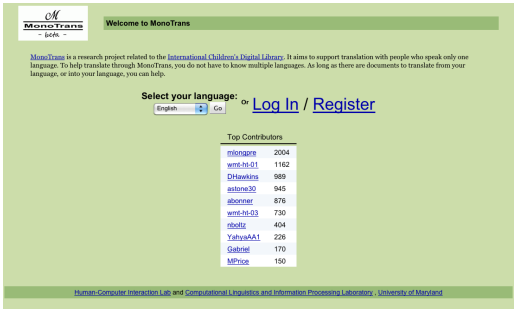


(a) Overview page showing a list of book translations



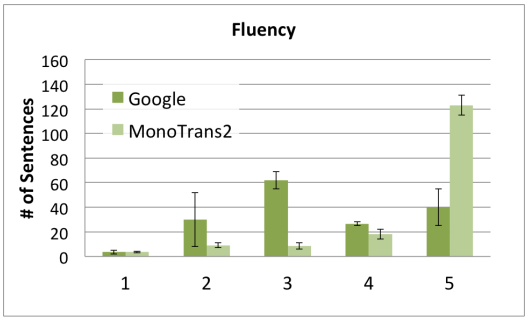
(b) Task selection page with bar chart

(c) User profile showing actitivies

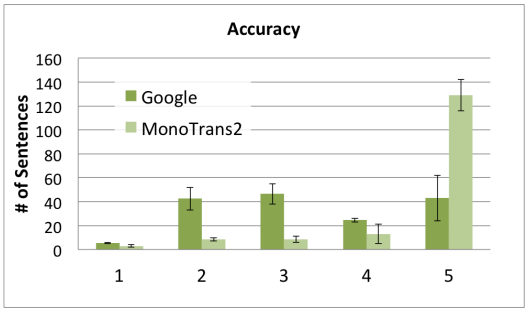


(d) Login page with most-active users board

Figure 5.4: Other pages in the MonoTrans2 user interface.

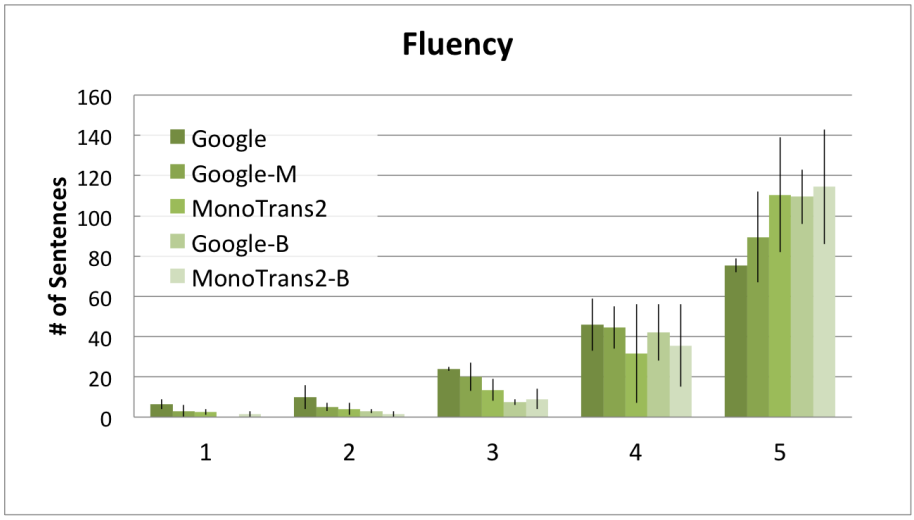


(a) Fluency Distribution

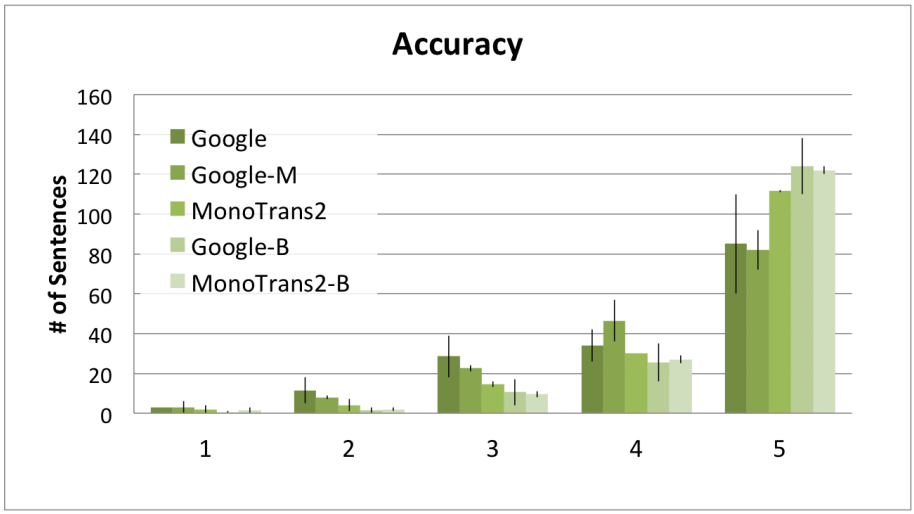


(b) Accuracy Distribution

Figure 5.5: Human judgments for fluency and accuracy. (See also Table 5.1.)



(a) Fluency Distribution



(b) Accuracy Distribution

Figure 5.6: Fluency and accuracy scores for the conditions in the comparative study. The error bars show the standard deviation. For the highest accuracy, MonoTrans2 and the two billingual post-editing conditions are close together.

Chapter 6

Case Study: Translating Haitian Earthquake Text Messages

The previous Chapters showed not only the feasibility of the monolingual translation protocol but also its quality improvement over machine translation and monolingual post-editing. However, all past experiments used children's books from ICDL as the translation material.[1] In this chapter, I discuss a case study with MonoTrans2 using emergency response text messages after the 2010 Haitian Earthquake as the translation material. This case study was part of the 2011 Workshop on Statistical Machine Translation (WMT 2011) shared translation task [9].

In this case study, I recruited the non-English-speaking Haitian Creole speakers from Haiti. MonoTrans2 successfully organized these monolingual users from Haiti, in a very different environment than all previous studies. It also obtained significant quality improvement over machine translation.

This case study was conducted in collaboration with Vladimir Eidelman, Yakov Kronrod and my advisor Philip Resnik. Vladimir Eidelman calculated the TER and BLEU scoring; Yakov Kronrod performed the statistical analysis reported in Section 6.3.4; Philip Resnik discussed the study in broader context (revised and included in Section 6.1, Section 6.4.2, Section 6.4.3 and Section 6.4.4).

I executed the rest of the case study including system setup, participant recruiting, translation quality evaluation (human judgments) and analysis. I was the

[1] The International Children's Digital Library

lead author on the paper published at the 2011 Workshop on Statistical Machine Translation (WMT 2011) [28]. This chapter is revised from the WMT 2011 paper.

6.1 Background

One of the most remarkable success stories to come out of the recovery efforts following the January 2010 earthquake in Haiti involved translation [52]. While other forms of emergency response and communication channels were failing, text messages were still getting through, so a number of people came together to create a free phone number for emergency text messages, which allowed earthquake victims to report those who were trapped or in need of medical attention. The problem, of course, was that most people were texting in Haitian Creole (Kreyól), a language not many of the emergency responders understood, and few, if any, professional translators were available. The availability of usable translations literally became a matter of life and death.

In response to this need, Stanford University graduate student Rob Munro coordinated the rapid creation of a crowdsourcing framework, which allowed volunteers–including, for example, Haitian expatriates and French speakers–to translate messages, providing responders with usable information in as little as ten minutes. Translations may not have been perfect, but to a woman in labor, it had to have made a big difference for English-speaking responders to see *Undergoing children delivery Delmas 31* instead of *Fanm gen tranche pou fè yon pitit nan Delmas 31.*

What about a scenario, though, in which even amateur bilingual volunteers

are hard to find, or too few in number? What about a scenario, for example, the March 2011 earthquake and tsunami in Japan, in which there was tremendous value of news in Japanese and many people worldwide who wished to help but were not fluent in both the source and target languages?

For such a scenario, crowdsourced monolingual translation systems such as MonoTrans2 (Chapter 5) could be very useful. The MonoTrans2 system had previously shown very promising results on children's books: As described in Section 5.3, on a test set where Google Translate produced correct translations for only 10% of the input sentences, monolingual German and Spanish speakers using MonoTrans2 produced translations that were fully correct (as judged by two independent bilinguals) 68% of the time (see Section 5.3 for more details); further studies also showed that MonoTrans2 produced better output than monolingual post-editing (Section 5.5).

For this case study, I used MonoTrans2 on the WMT 2011 Haitian-English translation task data set [9]. I hired Haitian Creole speakers located in Haiti, and recruited English speakers located in the U.S., to serve as the monolingual crowds.

6.2 System Setup

The system used was MonoTrans2. As described in Chapter 5, it implements an asynchronous version of the crowdsourced monolingual translation protocol (described in Section 3.2.4).

In MonoTrans2, monolingual Haitian Creole speakers and monolingual English

speakers collaborate to translate text messages from Haitian Creole into English. Haitian Creole text is translated by the machine translation engine into English for the English speakers to process, and the processed English text is back-translated into Haitian Creole for the Haitian Creole speakers. The translations and back-translations are passed back and forth asynchronously several times between the two crowds of monolingual people. Together, the two crowds of monolingual people try to make sense of the (usually noisy) machine-translated sentences and progress toward a correct translation.

In MonoTrans2, each Haitian Creole sentence is first automatically translated into English and presented to the English speakers. The English speakers then can perform any of the following tasks on the candidate translations:

- **Edit:** Edit and improve current translation.
- **Mark translation error:** Indicate that a phrase appears problematic in English.
- **Vote:** Vote any translation candidate up or down.

Identifying likely errors and voting for candidates are things monolinguals can do reasonably well: even without knowing the intended interpretation, one can often identify when some part of a sentence does not make sense, or when one sentence seems more fluent or plausible than another. Sometimes rather than identifying errors, it is easier to suggest an entirely new translation candidate based on the information available on the target side, a variant of monolingual post-editing [7] [1].

Any new translation candidates are then back-translated into Haitian Creole, and any phrase marked as containing translation errors are projected back to identify the corresponding phrase in the source sentence, using word alignments as the bridge (see Section 3.3.2.2, also Hua et al [32]).[2] The Haitian Creole speakers can then perform the following tasks:

- **Edit:** Edit and improve current back-translation, this is in fact adding a paraphrased version of the source sentence.[3]
- **Annotate:** Attach an annotation to a phrase marked problematic by the English speakers. Annotations include:
  - **Attach web link:** Attach a web URL to explain the problematic phrase.
  - **Attach picture:** Attach an picture to explain the problematic phrase.
  - **Rephrase a phrase:** Express the problematic phrase in a different way.
  - **Give explanation with templates:** Highlight a phrase and use the predefined templates to given an explanation. Templates include "This is a person" and "This is a place".
- **Vote:** Vote any back-translation up or down.

Haitian Creole speakers can "explain" phrases marked as translation errors by offering a different way of phrasing the corresponding phrase of the source sentence [6], in

[2]The machine translation engine in MonoTrans2 is the Google Translate Research API which provides alignments with its hypotheses.

[3]As discussed in Chapter 3

order to produce a new source sentence, or by annotating the phrases with pictures (e.g. via Google image search) or Web links (e.g. to Wikipedia). The protocol then continues: new source sentences created via partial- or full-sentence paraphrase pass back through machine translation to the English side, and any explanatory annotations are projected back to the corresponding phrases in the English candidate translations (where the errors had been identified). The process is asynchronous: participants on the Haitian Creole and English sides can work independently on whatever is available to them at any time. At any point, the voting-based scores can be used to extract the best translation candidate as the system's output.

In summary, MonoTrans2 uses noisy machine translation to cross the language barrier, and supports monolingual participants in doing small tasks that gain leverage from redundant information, the human capacity for linguistic and real-world inference, and the wisdom of the crowd (for more details, see Chapter 3).

6.3 Experiment

For the case study, I recruited 26 English speakers and 4 Haitian Creole speakers. The Haitian Creole speakers were recruited from Haiti and do not speak English. They received compensation with an hourly rate higher than the local hourly wage. Five of the 26 English speakers were paid UMD undergraduates; the other 21 were volunteer researchers, graduate students and staff who were unrelated to this research.[4] Over a 13-day period, Haitian Creole and English speaker efforts totaled

[4]These, obviously, did not include any of my collaborators.

15 and 29 hours, respectively.

6.3.1 Data Sets

The case study used the text message data sets provided by the 2011 Workshop on Statistical Machine Translation (WMT 2011). The text messages were collected after the 2010 Haitian Earthquake. The workshop provided two sets, a *test* set whose usage was to test a system's performance and a *devtest* set whose usage was to adjust a system during its development. The original goal was fully processing the entire clean test and devtest sets, but it could not be realized in the available time, owing to unanticipated re-partitioning of the data into the test and the devtest sets (by the shared task organizers) and logistical challenges working with participants in Haiti.

Table 6.1 summarizes the data set sizes before and after reshuffling.

Table 6.1: Text message clean data sets before and after reshuffling

	before	after
test	1,224	1,274
devtest	925	900

I loaded 1,224 sentences from the pre-reshuffling test set, interspersed with 123 of the 925 sentences from the pre-reshuffling devtest set, into MonoTrans2 for translation. That is 1,347 sentences in total. I report results on the union of pre- and post-reshuffling devtest sentences (defined as Set A, $|A| = 1516$), and the post-reshuffling test set (defined as Set B, $|B| = 1274$).

From the 1,347 sentences available for processing in MonoTrans2, I define three

subsets:

- *Touched*: Sentences that were processed using MonoTrans2 by at least one person (657 sentences).
- *Each-side*: Sentences that were processed by at least one English speaker followed by at least one Haitian Creole speaker (431 sentences).
- *Full*: Sentences that have at least three translation candidates, of which the most voted-for candidate received at least three votes (207 sentences).

These sets were intersected with sets A and B in order to evaluate MonoTrans2 output against the provided references (Table 6.2).[5] [6]

Table 6.2: Data sets for evaluation and their sizes. *Touched* is the set of sentences that were processed by at least one person. *Each-side* is the set of sentences that were processed by at least one English speaker followed by at least one Haitian Creole speaker. *Full* is the set of sentences that have at least three translation candidates, of which the most voted-for candidate received at least three votes.

Set S	$\lvert S\rvert$	$\lvert S \cap A\rvert$	$\lvert S \cap B\rvert$
Touched	657	162	168
Each-side	431	127	97
Full	207	76	60

[5]Recall the definition of A and B: A is the union of pre- and post-reshuffling devtest sentences; B is the post-reshuffling test set.

[6]Note that according to these definitions, *Touched* contains both *Each-side* and *Full*, but *Each-side* does not contain *Full*.

6.3.2 Metrics

Two automatic evaluation metrics, BLEU and TER, were used along with human judgments to evaluate the translation quality of MonoTrans2 output.

BLEU (Bilingual Evaluation Understudy [56]) is an algorithm for evaluating the quality of text which has been machine-translated from one natural language to another. Here quality is considered to be the correspondence between a machine's output and that of a human: "the closer a machine translation is to a professional human translation, the better it is" [56]. BLEU scores are calculated for individual translated sentences by comparing them with a set of good quality reference translations. Those scores are then averaged over the whole corpus to reach an estimate of the translation's overall quality. Intelligibility or grammatical correctness are not taken into account. BLEU scores are usually percentages (between 0 and 100) which indicate how similar the candidate and reference texts were, with values closer to 100 representing more similar texts (and thus better translation quality).

TER (Translation Error Rate [64]) is an error metric for machine translation that measures the number of edits required to change a system output into one of the references. TER scores are also percentages. Unlike BLEU, lower TER scores represent better translation quality.

6.3.3 Evaluation

Tables 6.3 and 6.4 report two automatic scoring metrics, uncased BLEU and TER, comparing MonoTrans2 against Google Translate as a baseline.

Table 6.3: BLEU and TER results for different levels of completion on the devtest set A.

Set	Condition	BLEU	TER
$Touched \cap A$	Google	21.75	56.99
	MonoTrans2	23.25	57.27
Each-side $\cap A$	Google	21.44	57.51
	MonoTrans2	21.47	58.98
$Full \cap A$	Google	25.05	54.15
	MonoTrans2	27.59	52.78

Table 6.4: BLEU and TER results for different levels of completion on the test set B.

Set	Condition	BLEU	TER
$Touched \cap B$	Google	19.78	59.88
	MonoTrans2	24.09	58.15
Each-side $\cap B$	Google	21.15	56.88
	MonoTrans2	23.80	57.19
$Full \cap B$	Google	22.51	54.51
	MonoTrans2	28.90	52.22

Since the number of sentences in each evaluated set is different (Table 6.2 on page 116), we cannot directly compare scores between the sets. However, Table 6.4 shows that when the MonoTrans2 process is run on test items "to completion", in the sense defined by "Full" (i.e. $Full \cap B$), we see a dramatic BLEU gain of 6.39, and a drop in TER of 2.29 points. Moreover, even when only target-side or only source-side monolingual participation is available we see a gain of 4.31 BLEU and a drop of 1.73 TER points ($Touched \cap B$).

By contrast, the results on the devtest data are encouraging, but arguably mixed (Table 6.3). In order to step away from the vagaries of single-reference automatic evaluations, therefore, I also collected human evaluation of the translation quality. Two native English speakers unfamiliar with the project were recruited and

paid for fluency and accuracy evaluation: for each target translation paired with its corresponding reference, each evaluator rated the target sentence's fluency and accuracy on a 5-point scale, where fluency of 5 indicates complete fluency and adequacy of 5 indicates complete preservation of meaning (see Section 5.3 for details, also see Dabbadie et al [12]).[7]

Table 6.5: Distribution of fluency scores (top) and accuracy scores (bottom) by evaluator. Each column shows the number of sentences receiving that rating. M1 and M2 are the monolingual English-speaking evaluators. Set: $Full \cap A$.

Fluency		1	2	3	4	5	Total
M1	Google	7	11	33	23	2	76
	MonoTrans2	0	2	14	30	30	76
M2	Google	1	1	16	55	3	76
	MonoTrans2	0	0	3	31	42	76

Accuracy		1	2	3	4	5	Total
M1	Google	4	6	18	20	28	76
	MonoTrans2	1	3	10	19	43	76
M2	Google	2	2	9	23	40	76
	MonoTrans2	2	6	8	18	42	76

Similar to Section 5.3, I adopted the very conservative criterion that a translation output was considered correct only if *both* evaluators independently gave it a rating of 5. Unlike the evaluation using children's books in Section 5.3, which required both fluency and adequacy, this application required only adequacy, since in this scenario what mattered to aid organizations was not whether a translation was fully fluent, but whether it was correct. On this criterion, the Google Translate baseline of around 25% correct was improved to around 40% by MonoTrans, consistently for both the devtest and test data (Table 6.7). Nonetheless, the improvements

[7]Presentation order was randomized.

Table 6.6: Distribution of fluency scores (top) and adequacy scores (bottom) by evaluator. Each column shows the number of sentences receiving that rating. M1 and M2 are the monolingual English-speaking evaluators. Set: $Full \cap B$.

Fluency		1	2	3	4	5	Total
M1	Google	2	1	25	30	2	60
	MonoTrans2	0	1	5	33	21	60
M2	Google	1	2	12	42	3	60
	MonoTrans2	0	1	0	33	26	60

Adequacy		1	2	3	4	5	Total
M1	Google	2	2	9	25	22	60
	MonoTrans2	0	3	5	10	42	60
M2	Google	1	3	7	18	31	60
	MonoTrans2	1	3	8	22	26	60

Table 6.7: Number of sentences with maximum possible adequacy (5) in $Full \cap A$ and $Full \cap B$, respectively.

Sentences	N	Google		MonoTrans2	
$Full \cap A$	76	18	(24%)	30	(39%)
$Full \cap B$	60	15	(25%)	23	(38%)

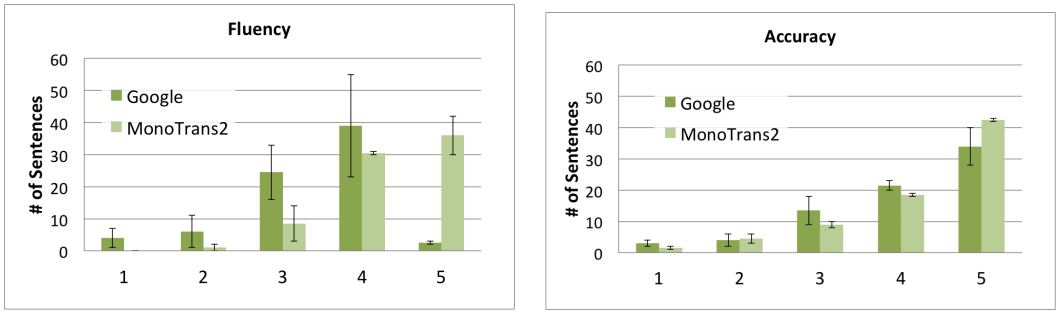
in fluency were if anything more striking, as Figures 6.1 and 6.2 illustrate.

6.3.4 Statistical analysis of monolingual tasks[8]

In addition to the main evaluation, we investigated the relationship between tasks performed in the MonoTrans2 system and human judgments using linear regression and an analysis of variance. We evaluated the set of all 330 touched sentences in $Touched \cap A$ and $Touched \cap B$ in order to understand which properties of the MonoTrans2 process correlate with better translation outcomes.

This analysis focused on improvement over the Google Translate baseline,

[8]This analysis was performed in collaboration with Yakov Kronrod.



(a) Fluency Distribution

(b) Adequacy Distribution

Figure 6.1: Human judgments for fluency and adequacy in fully processed devtest items ($Full \cap A$)

looking specifically at the improvement based on the human evaluators' averaged fluency and adequacy scores.

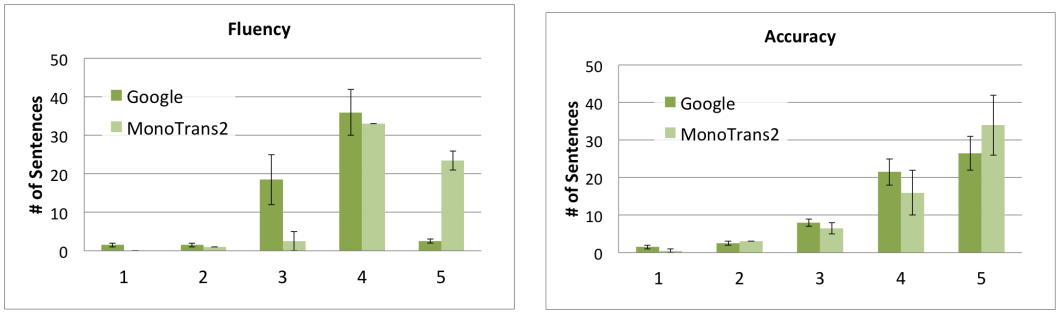
Table 6.8 summarizes the positive and negative effects for the five variables we considered that had a significant effect for at least one of the measures.[9]

Table 6.8: Effects of independent variables in linear regression for 330 touched sentences. (Significance codes: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$, 'NS' indicates that the effect was not significant.)

Variable	Adequacy	Fluency
Positive		
mostSingleCandidateVote	**	***
candidateCount	**	**
numOfAnswers	*	NS
Negative		
roundTrips	***	***
voteCount	*	.

The positive results were as expected. Having more votes for the winning candidate (*mostSingleCandidateVote*) was correlated with higher success, since this

[9] A sixth, *numOfVoters*, was not significant in the linear regression for either adequacy or fluency.



(a) Fluency Distribution

(b) Adequacy Distribution

Figure 6.2: Human judgments for fluency and adequacy in fully processed test items ($Full \cap B$)

means that more people felt it was a good representative translation. Having more candidates to choose from (*candidateCount*) implied that more people had taken the time to generate alternatives, reflecting attention paid to the sentence. Also, the amount of attention paid to target speakers' requests for clarification (*numOfAnswers*) is as expected related to the adequacy of the final translation, and perhaps as expected does not correlate with fluency of the output since it helps with meaning and not actual target-side wording.

However, the negative influence of the *roundTrips* measure and *voteCount* measures seemed confusing at first glance. We conjectured that the first effect arised due to a correlation between *roundTrips* and translation difficulty; much harder sentences would have led to many more paraphrase requests, and hence to more round trips. We attempted to investigate this hypothesis by testing the correlation of with a naïve measure of sentence difficulty, length, but this was not fruitful. We suspect that inspecting the use of abbreviations, proper nouns, source-side mistakes,

and syntactic complexity would give us more insight into this issue.

As for *voteCount*, the negative correlation is understandable when considered side by side with the other vote-based measure, *mostSingleCandidateVote*. Sentences with higher number of votes for the winning candidate generally had greater measures of improvement (strongly significant for both adequacy and fluency), so a higher general vote count means that people were also voting more times for other candidates. Hence, once the positive winning vote count is taken into account, the remaining votes actually represent disagreement on the candidates, hence correlating negatively with overall improvement over baseline.

It is important to note that when these measures are all considered together, they show that there is a clear correlation between the MonoTrans2 system's human processing and the eventual increase in both quality and fluency of the sentences. As people give more attention to sentences, these sentences show better performance, as judged by the increase in quality over the baseline.

6.4 Discussion

6.4.1 Design lessons

This study was the first attempt to use MonoTrans2 with people who were strictly monolingual. These people also speak a language that was not well-supported by machine translation.[10] From my experience working with the Haitian people, I learned some important design lessons that previous studies had not revealed.

[10] At the time of this study, Google Translate's support for Haitian Creole was in alpha state.

First of all, bootstrapping MonoTrans2 may become an issue for less common languages. Before monolingual Haitian Creole speakers could use MonoTrans2, its user interface needed to be translated into Haitian Creole correctly and precisely. Since the user interface was rather complex, translating each piece of text along with the contextual help messages required in-depth understanding of the underlying protocol (Chapter 3), which can be quite difficult because this is usually not the translator's specialty. Before the study, I commissioned the translation task to our bilingual Haitian informant (who was also helping with organizing the study), but apparently the translation was done somewhat inaccurately due to that person's limited understanding of the system and English comprehension skills. This problem affected user motivation and the final translation quality, but more importantly, it revealed the limitation of a complex UI, especially one that depends heavily on users' understanding of the underlying translation protocol.

The second problem has to do with Haitian participants' limited access to technology. None of the Haitian participants had Internet connection at home, so finding a location with Internet access to use MonoTrans2 became a major problem. Ultimately an Internet café turned out to be the best option, but even with an Internet café, the connection was slow and sometimes sporadic. The complex user interface that MonoTrans2 had required many HTTP requests, which also became a limitation for the study.

Cultural differences were an important lesson, too. While the English speakers participating from the U.S. were quite used to doing this sort of paid part-time work, the Haitian participants were much less motivated. According to our Haitian

informant, Haitian people are much more inclined to accept a permanent job than to take paid part-time jobs, even with a much higher pay rate. As a result, it was rather difficult to recruit participants from Haiti during the case study.

These lessons directly affected the design of a new system, MonoTrans Widgets (which I will discuss in more detail in Chapter 7). In MonoTrans Widgets, the user interface and tasks are greatly simplified so that no knowledge about the translation protocol is required; the simplified user interface also requires very little translation to bootstrap and little bandwidth to use.

6.4.2 User motivation

This case study did not address acquisition of, and incentives for, monolingual participants. In fact, as discussed in Section 6.4.1, getting time from Haitian Creole speakers, even for pay, created a large number of logistical challenges, and was a contributing factor as to why I did not obtain translations for the entire test set. However, availability of monolingual participants is not the issue being addressed in this experiment: I am confident that in a real-world scenario like the Haitian or Japanese earthquakes, large numbers of monolingual volunteers would be eager to help, certainly in larger total numbers than *bilingual* volunteers. What matters here, therefore, is not how much of the test set was translated in total, but how much the translations improved for the sentences where monolingual crowdsourcing was involved, compared to the machine translation baseline, and what throughput might be like in a real-world scenario.

6.4.3 System throughput

In Section 5.6, throughput in MonoTrans2 extrapolated to roughly 800 words per day, a factor of 2.5 slower than professional translators' typical speed of 2000 words per day (Section 5.6). In this experiment, the overall translation speed averaged about 300 words per day, a factor of more than 6 times slower. However, this is an extremely pessimistic estimate because the previous experiment with MonoTrans2 had more than 20 users per side, while here the Haitian crowd consisted of only four people. Moreover, the problems described in Section 6.4.1 were also major contributing factors. It is fair to assume that in a real-world scenario, some unanticipated problems like these might crop up, but it also seems fair to assume that many would not; for example, most people from the Haitian Creole and French-speaking communities who volunteered using Munro et al.'s system in January 2010 were not themselves located in Haiti.

6.4.4 Translation quality

Finally, regarding quality, the results were promising, albeit not as striking as those obtained for Spanish-German translation of children's books in Chapter 5. The nature of the text messages itself may have been a contributing factor to the lower translation adequacy: even in clean form, these are sometimes written using shorthand (e.g. "SVP"), and are sometimes not syntactically correct. The text messages are seldom related to each other, unlike sentences in larger bodies of text where even partially translated sentences can be related to each other to provide

context, as is the case for children's books. One should also keep in mind that support for Haitian Creole to English translation in the underlying machine translation engine, Google Translate was still in an alpha phase at that time.[11]

Those considerations notwithstanding, it is encouraging to see that the crowdsourced monolingual translation protocol, implemented by MonoTrans2, is applicable to the translation of materials other than children's books.

6.5 Summary

In this chapter, I discussed a case study with MonoTrans2 during which emergency response text messages after the 2010 Haitian Earthquake were used as translation material. This case study also used monolingual Haitian Creole speakers who did not speak English as one of the monolingual crowds. MonoTrans2 successfully organized these monolingual users in a very different environment, and with very different translation material. Like the previous studies, MonoTrans2 also yielded significant quality improvements over machine translation alone.

[11] This study was conducted in March 2011.

Chapter 7

MonoTrans Widgets: Deploying Monolingual Translation in the Wild

This chapter discusses the first attempt to deploy a monolingual translation system to casual web users, or users who were not recruited as experiment participants and whose primary activity is personal web browsing, unrelated to translation.[1]

The previous chapters showed the crowdsourced monolingual translation protocol's feasibility as well as its quality improvement over both machine translation and monolingual post-editing. Chapter 4 showed the protocol's feasibility through MonoTrans; Chapter 5 showed MonoTrans2's quality improvement over machine translation and monolingual post-editing; Chapter 6 showed that MonoTrans2 could translate short text messages from a language (Haitian Creole) not very well supported by the machine translation engine, with non-English-speaking monolingual users having limited Internet access.

With the protocol's performance in these situations established, this chapter discusses a system that supported translation among much larger crowds of monolingual people: the users of the International Children's Digital Library (ICDL).[2]

The user population of ICDL was a good candidate for large-scale deployment

[1]This system was first deployed in August 2011. Duolingo (`http://www.duolingo.com`), a commercial system, was not in invited testing until November 2011.

[2]ICDL is at: `http://childrenslibrary.org`.

because it was a sizable and diverse population with sufficient Internet access. Compared to general web users, ICDL users might be more willing to use a system that translates children's books, so they were more likely to provide high quality work.

However, the user interface of MonoTrans2 was too complex for casual web users, so deploying MonoTrans2 directly to ICDL was unsuitable. MonoTrans Widgets, a new system based on micro-tasks was designed to replace MonoTrans2. Experiments showed that the MonoTrans Widgets system was effective for engaging casual ICDL users and generated high-quality translation.

This chapter discusses the motivation behind designing a new system, the design of the MonoTrans Widgets system, the evaluation of its translation quality and an analysis of the types of machine translation errors the system corrected. Examples of the translation process using MonoTrans Widgets are included. This chapter also includes several design lessons learned from working with real-world crowds. These design lessons are relevant to a broad range of crowdsourcing systems that draw expertise from multiple crowds.

An earlier version of this chapter was published as [26].

7.1 Motivation

7.1.1 Recruiting Users from ICDL

The ICDL user population was a sizable and diverse population with sufficient access to the Internet. The ICDL typically receives 4,000 to 7,000 daily visits from

228 countries around the world.[3] These users also had access to the Internet with sufficient bandwidth to use MonoTrans2, unlike the Haitian participants who had limited Internet access (Section 6.4.1).

The ICDL users might be more motivated than other casual web users to use a monolingual translation system, because the ICDL contained more than 4,000 books in 61 languages and was actively translating them into all the available languages. In fact, more than 3,600 ICDL users had already registered to be volunteer translators (mostly to or from English).

Before deploying to ICDL, some ICDL users had also been exposed to the crowdsourced monolingual translation protocol. Two special groups of ICDL users participated in previous experiments with MonoTrans2: volunteer translators, and the so-called "ICDL ambassadors", avid users who had volunteered to help promote the ICDL among their friends and family.[4] The latter were presumed to be mostly monolingual.

7.1.2 Difficulties deploying MonoTrans2

Given the sizable user population on ICDL, their Internet access, the good cause of translating children's books and some users' previous experience with MonoTrans2, it appeared that connecting MonoTrans2 and ICDL would naturally bring in the ICDL users as workers for crowdsourced monolingual translation. However,

[3]Visits were counted by the number of individual IP addresses.

[4]The volunteer translators signed up to translate for ICDL between English and their native language. They did not speak both languages involved in studies using MonoTrans2.

Connecting MonoTrans2 directly with ICDL turned out to be surprisingly ineffective. The participants of the previous user studies had been encouraged to continue using MonoTrans2 after the studies. A direct link to MonoTrans2 was also set up on ICDL's "How to Contribute" page.[5] However, the number of MonoTrans2 users quickly declined. Participant comments after the experiments indicated that some dedicated users did find MonoTrans2 enjoyable and continue using MonoTrans2. However, the system as a whole was not effective because there were not enough users.

7.1.3 User Interface Complexity of MonoTrans2

Compared to conducting studies in which the participants were recruited to use MonoTrans2, deploying among the casual users of ICDL was very different. The user were not participants directly recruited to use the system for any particular period of time. They might have limited time and effort to spare ([43], Task Granularity). Unlike the volunteer translators who participated earlier, most ICDL users might not be familiar with the translation of children's books.

Unfortunately, both participant comments and my own analysis of the MonoTrans2 user interface indicated that using MonoTrans2 involved too much overhead for casual users. To use MonoTrans2 successfully, one needed to understand the monolingual translation protocol and to choose monolingual tasks to perform.

First of all, using MonoTrans2 required an understanding of the crowdsourced monolingual translation protocol. During the previous experiments, participants

[5] `http://en.childrenslibrary.org/contribute/index.shtml`

expressed confusion about the phrase "monolingual translation". The monolingual participants did not understand how they could help with translation because "translation" implied fluency in two languages, even though they were fully committed to using MonoTrans2. In those experiments, participants were recruited with an email message that contained a thorough explanation. With casual ICDL site visitors, such explanation would not be practical.

The way MonoTrans2 presented monolingual tasks also caused some confusion. The user interface of MonoTrans2 was posed as a book translation. Sentences were organized into pages, and all sentences on the same page were shown together. Users could open any sentence to see all its monolingual tasks, and it was up to the users to decide which task to perform. While this design provided users of MonoTrans2 with ample context and the freedom to choose among the available tasks, experiment participants commented that they had difficulty to choosing a task among all the tasks on a page.

User accounts with MonoTrans2 might also have created friction for casual use. MonoTrans2 used user accounts for quality control. Although anybody could view the translation content on MonoTrans2, users needed to register and log in using their accounts before they could perform any task. In order to engage more casual users, I chose to design the interaction to support more users, even those who were unwilling to register just to perform a short task not for their direct benefit.

In addition to the user interface overhead, the complexity of MonoTrans2's user interface also posed a problem for bootstrapping the system. As discussed in Section 6.4.1, the user interface itself needed to be translated before non-English-

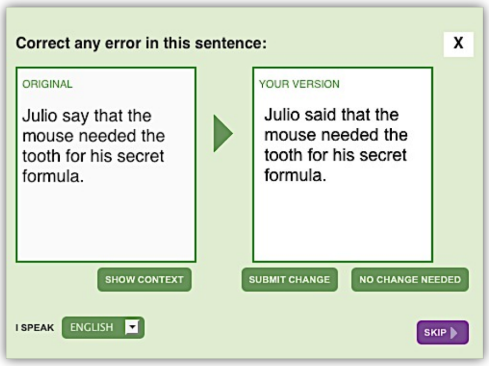
speaking monolingual users could use it. With a complex user interface, the effort to translate MonoTrans2 into (even) half a dozen intended target languages was nontrivial.

To summarize, MonoTrans2 was designed to provide monolingual users with more translation context, but its complex user interface caused overhead in both bootstrapping and interacting with the system, and the user interface complexity undermined the system's ability to engage casual users.

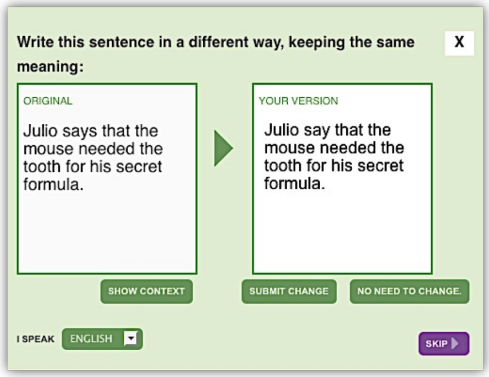
7.2 Design of MonoTrans Widgets

MonoTrans Widgets is a system designed to simplify the MonoTrans2 user interface. It is a collection of widgets deployed directly to the ICDL website (see Figure 7.1 on page 134). The widgets are small embedded web pages with instructions and a task.[6] Tasks in the MonoTrans Widgets system are similar to those in MonoTrans2, but the system presents each type of task in a separate widget. The tasks are presented to the users one by one to help them focus on the current task without distraction. This system does not require users to select tasks, nor does it require them to understand the crowdsourced monolingual translation protocol. The system does not require user accounts. Instead, to provide consistent user experience and track input from the same user, it uses browser cookies to identify users.

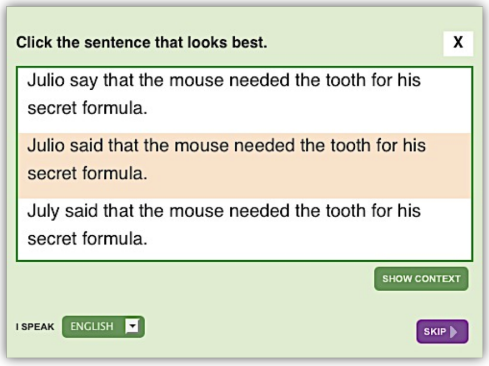
[6]The web pages are embedded using the HTML IFrame technology.



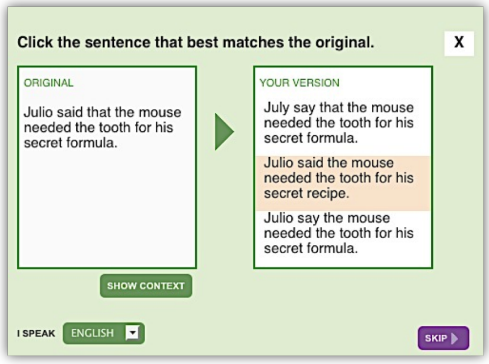
(a) Editing (target side)



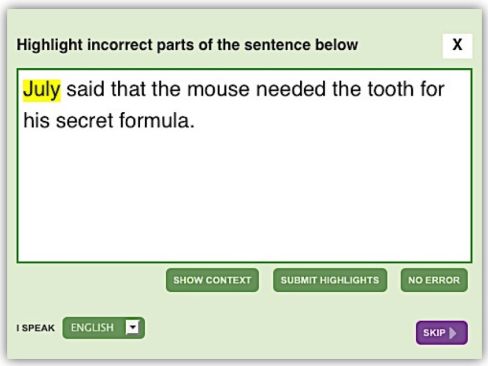
(b) Editing (source side)



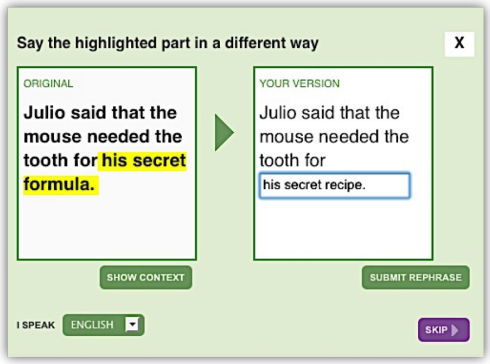
(c) Voting (target side)



(d) Voting (source side)



(e) Marking translation error on target side



(f) Giving explanation on source side

Figure 7.1: Widgets in the MonoTrans Widgets system. Each widget presents one type of tasks. Tasks for target language speakers are shown on the left; tasks for source language speakers are shown on the right. For illustrative purposes, both source language tasks and target language tasks are shown in English.

7.2.1 Widgets and micro-tasks

This new design based on widgets represents a trade-off between user interface simplicity and task context. By providing more context, such as page background images and neighboring sentences, MonoTrans2 maintains consistency among sentences being translated because the sentences can all be viewed on the same page. On the other hand, with widgets, the amount of context provided is limited. For example, users cannot see background images in picture books as they can in MonoTrans2.

However, like the tasks presented in the widgets, shorter and self-contained tasks ("micro-tasks") that encourage quick completion are more common in most crowdsourcing systems. Anyone who has an online account may have encountered reCAPTCHA [72], and thus contributed to that crowdsourced OCR project. The fine granularity of micro-tasks is crucial to solicit answers from a large crowd [43]. Micro-tasks can also be used to accomplish complex tasks when combined appropriately [46][8]. In particular, bilingual translation can be done through micro-tasks on Mechanical Turk [8].

Removing task context such as background images in pages and neighboring sentences may cause an impact on the overall output quality for MonoTrans Widgets. However, I hypothesized that once sufficient user engagement would help maintain translation quality. Therefore, the design of MonoTrans Widgets opts to engage more users even at the expense of context. Although some redundancy is lost with the absence of background images and neighboring sentences, redundancy is still

introduced by the iterative translation protocol itself. As we will see later, the results of the experiments confirmed this hypothesis, showing that choosing micro-tasks with limited context was effective for engaging more workers while still maintaining translation quality.

7.2.2 Implementation of the translation protocol

The MonoTrans Widgets system uses an asynchronous interaction model like MonoTrans2. At any given time, a sentence has multiple translation threads (represented by translation candidates).

Similar to MonoTrans2, the stopping condition is based on aggregated worker agreement. The stopping condition is operationalized as the following: If a sentence has a translation candidate that has been passed between the source side and the target side for five times, or a candidate that has received more than five votes from both sides, then translation of the sentence is considered to be completed.[7]

Unlike MonoTrasn2, however, the system only shows each user one task at a time. The users can skip a task and be assigned a new one (more details about task assignment in Section 7.2.3).

The MonoTrans Widgets system supports the same types of tasks as MonoTrans2. Each task is tailored into a customized widget which is embedded within the ICDL website. There are six types of tasks (see Figure 7.1). The target language speaker tasks are:

[7]These parameters were also used in MonoTrans2 and were proven to be effective in previous experiments.

- **Edit:** Edit and improve current translation.[8]
- **Mark translation error:** Indicate that a phrase appears problematic in the target language.
- **Vote:** Select the best translation candidate for a sentence from a list of three .

The source language speaker tasks are:

- **Edit:** Edit back-translation to match the original meaning.
- **Rephrase a phrase:** Express the problematic phrase in a different way.
- **Vote:** Select back-translation that best carries the original meaning (from a list of three).

This design differs from that of MonoTrans2 in that, the annotation channel in MonoTrans Widgets contains only error identification on the target side and phrase-level paraphrase on the source side. Several other types of annotations are not included because longer tasks are not suitable for casual users with limited time and effort to spare. For example, to use an image as an annotation in MonoTrans2, the user must first perform an image search using a search engine and then manually browse the list of search results for a suitable image. Similarly, annotations with web links in MonoTrans2 require that the receiver go to an external web site to see the attached content. These tasks require two or more steps of user action (e.g., first

[8]This is effectively monolingual post-editing.

search and then go through the results), so they are not included in the MonoTrans Widgets system.

The voting process in MonoTrans Widgets is also different from MonoTrans2. In MonoTrans2, workers can see and vote on all candidates of the same sentence; in MonoTrans Widgets, however, because of the limited size of the voting widget, only three candidates of the same sentence can be shown at one time. To counter any bias from such a shorter list, the candidates shown were chosen randomly.

Like MonoTrans2, machine translation in the MonoTrans Widgets system is accomplished using the Google Translate Research API.[9]

7.2.3 Task Assignment

Monolingual tasks in the MonoTrans Widgets are presented to the users one at a time. The system uses an assignment algorithm to choose which task to assign each user.

The task assignment algorithm consists of two parts: sentence selection and task type selection. To generate a task for a user, the system first selects a sentence from all the sentences being translated to or from the user's language. It then chooses a task for the selected sentence.[10]

Sentence selection is implemented as the following (see Algorithm 7.1): When new users start using the system, the system assigns them the sentence with the

[9] `http://research.google.com/university/translate/docs.html`

[10] These two steps are not always independent. For example, whether a voting task could be chosen depends on whether the selected sentence has three candidates.

highest priority score, translating to or from their language (more about priority score in Section 7.2.3.1). To help users establish the context for translation, the system assigns returning users consecutive sentences from the same book.

Algorithm 7.1 Sentence selection

```
function selectSentence(user)
    if user.sentence = null then
        select sentences translating to or from user.lang into list S
        select from S sentence s with the highest priority score
    else
        select the sentence s following user.sentence
    end if
    user.sentence ← s
    return user
end function
```

Task type selection is implemented as a Markov chain (see Algorithm 7.2). When a new user starts using MonoTrans Widgets, the initial task type is selected randomly from a predefined distribution. The user is then assigned tasks of the same type, with a probability to be assigned a different type after each task.

Algorithm 7.2 Task type selection

```
function selectTaskType(user)
    if user.taskType = null then
        select task type t from a predefined distribution
        user.taskType ← t
    else
        select random number r from [0, 1]
        compare r to predefined threshold T
        if r ≤ T then
            select task type t from a predefined distribution
            user.taskType ← t
        end if
    end if
    return user
end function
```

Finally, since the system requires no login, returning users are associated with

their past activity using browser cookies.

7.2.3.1 Sentence priority score

The sentence priority score is designed in a way that mitigates the computation load of handling many simultaneous viewers. Since the system is designed for casual web users, many of whom view the tasks without ultimately performing them, it is desirable to express sentence priority as a score which can be indexed and sorted quickly. Once calculated, priority scores are cached and are updated only when there is a new submission about the corresponding sentence.

Algorithm 7.3 (page 141) calculates a sentence's priority score. The priority score is a linear combination of two parts: 1) how close the sentence is to being completed; and 2) how hard it is to get the sentence's source or target language speakers.

The first part prevents user effort from being dispersed among many unfinished sentences. It is similar to the sentence completeness in Section 5.2.4.2.[11] The second part is needed because the language distribution among ICDL users is highly uneven, and because the system needs to simultaneously organize speakers of different languages to participate in multiple book translations involving different language pairs (see Section 7.5.1 for more discussion).

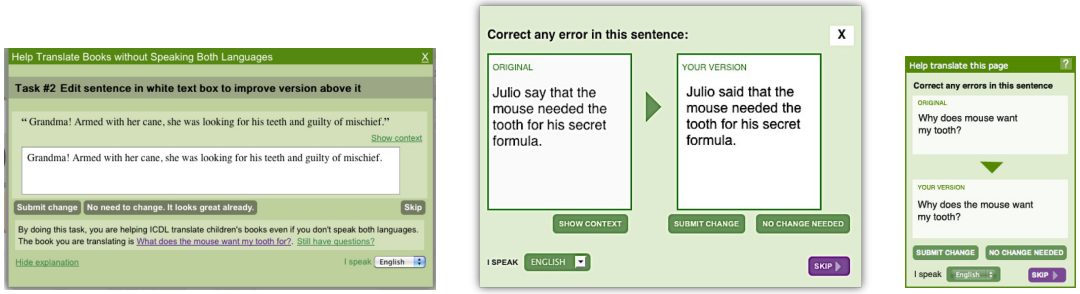
Algorithm 7.3 Calculating priority score

```
function PRIORITY(s)
    for each c in s.candidates do
        t ← the number of times c was passed between source side and target side
        c.trips ← t
    end for
    select maxc from s.candidates with max trips
    if maxc.trips ≥ MAXTRIP or maxc.votes ≥ MAXVOTE then
        s.priority ← 0
    else
        s.priority ← 1 − (MAXTRIP − maxc.trips)/MAXTRIP
    end if
    if s.priority ≠ 0 then
        p_s ← (1/the percentage of s.sourceLang among ICDL languages), normalized
        p_t ← (1/the percentage of s.targetLang among ICDL languages), normalized
        s.priority ← s.priority + p_s + p_t
    end if
end function
```

7.2.4 Evolution of the widget layout

The design of the widgets underwent two revisions. The widgets originally used a vertical layout (Figure 7.2(a)), with the task request on top and the user action at the bottom. Its design rationale was that since users read from top to bottom, presenting the task in the same order would be natural. After deploying the MonoTrans Widgets to the ICDL for some time, the widgets were revised to use a horizontal layout which more clearly grouped materials "before change" onto the left and user changes onto the right (see Figure 7.2(b)). Widgets with the vertical layout were deployed on ICDL between August and November 2011; widgets with

[11] As discussed in Section 7.2.2, the parameters *MAXTRIP* and *MAXVOTES* were all equal to five.



(a) Vertical Layout (b) Horizontal Layout (c) iGoogle

Figure 7.2: Evolution of the widget layout. Figures 7.2(a) and 7.2(b) are two versions of widget layouts deployed on ICDL. Figure 7.2(c) is the layout for the iGoogle gadget deployed on other websites.

the horizontal layout were deployed on ICDL between December 2011 and May 2012.

In addition, the widgets also had a layout specifically designed for use with the commercial iGoogle gadgets service.[12] This layout was introduced so that widgets could be easily embedded into websites other than the ICDL. Due to the limited size of iGoogle gadgets, the MonoTrans iGoogle gadget used a vertical layout which grouped the material before change on the top and user changes at the bottom (Figure 7.2(c)). The iGoogle gadget was deployed on several websites, including the University of Maryland Human-Computer Interaction Lab (HCIL) home page, between February and May 2012.

[12] `http://www.google.com/ig`

7.3 Deployment to ICDL

I deployed the MonoTrans Widgets to the International Children's Digital Library (ICDL) from August 2011 to May 2012. The widgets were placed on every book reader page within ICDL.[13] On those pages, a banner was placed with the text "Help Translate Books without Speaking Both Languages". When users clicked on the banner, a widget would appear (see Figure 7.3 and Figure 7.4 on page 144). The widgets were available in six languages: Chinese, English, French, German, Japanese and Spanish. Users could also switch to other languages within the widget.

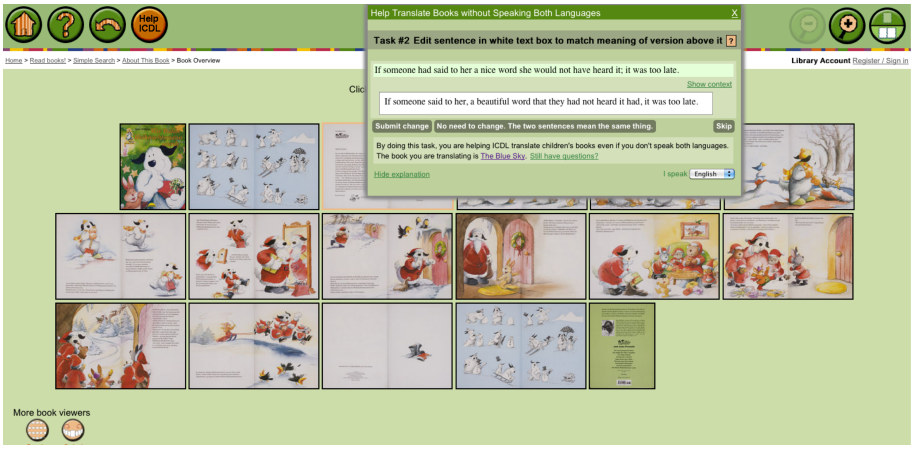


Figure 7.3: A widget with the vertical layout deployed on an ICDL page. The widget is placed in the upper-center region of the page. When the widget appears, the banner on top turns into the widget's title bar.

The widgets were viewed by more than 155,000 ICDL users.[14] The users finished translating eleven books between six language pairs (that is, 55 book trans-

[13]ICDL has other pages such as library information, library facts, etc. The widgets were not placed on these pages.

[14]The number of users was counted by unique IP addresses.

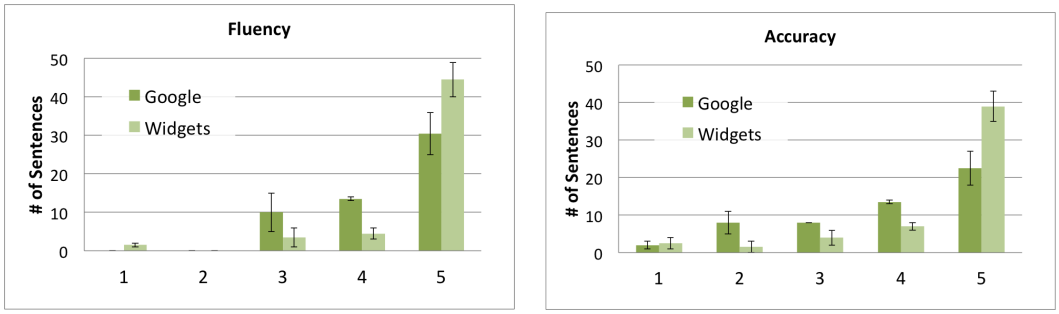
Figure 7.4: A widget with the horizontal layout deployed on an ICDL page. The widget is placed in the center of the page, with the rest of the page dimmed. When the "show context" button below the left text box, is clicked, the widget displays the sentences immediately before and after the current sentence. When users click on the "How am I helping?" link, an explanation of the monolingual translation protocol is shown. The interface language can be selected using the drop-down language selector in the lower-left region of the widget.

lations).[15]

7.4 Results and Analysis

7.4.1 Quantitative Evaluation

I analyzed the translation quality resulting from a trial deployment of MonoTrans Widgets during the 14-day period spanning September 5 to September 18, 2011. During this period, 27,858 users viewed the MonoTrans Widgets, and there were 6,358 widget task submissions.



(a) Fluency Distribution

(b) Accuracy Distribution

Figure 7.5: Human judgments for fluency and accuracy. Notice there are more sentences with highest fluency and accuracy score (5) among the MonoTrans Widgets output.

Because English and Spanish are the two most common languages on ICDL, I selected one English book (for translation into Spanish) and one Spanish book (for translation into English) for use with this quantitative evaluation. The English book

[15]These books contain 3,600 words. Had a translation service been hired to translate them, at $0.25 per word, the translation of books into five languages would have cost $4,500.

contains 30 sentences, and the Spanish book contains 24 sentences. Both books were translated from the language in which they were originally published. Compared to other books (in other languages), these books contained more edited sentences during the 14-day period.[16] [17]

The two book translations received 3,678 user submissions (including edits, votes, error identifications and explanations) from 739 workers[18]. For each submission, the average time spent per submission on either side was 126 seconds. On average, each sentence was edited 1.1 times by both the English speakers and the Spanish speakers.

Two native bilingual evaluators independent to the MonoTrans Widgets system were recruited to assess translation quality for fully automatic output of Google Translate (as the baseline) and for the output of MonoTrans Widgets (using Google Translate as the translation engine). [19]

During evaluation, the evaluators were not told how the translations were done, and the sentences were presented to them in mixed random order. For each translation, the evaluators were given its corresponding original sentence, and their task was to rate its fluency and accuracy on a 5-point scale: fluency of 5 indicates complete fluency; accuracy of 5 indicates complete preservation of meaning (for

[16]While more editing probably implied better translation quality, translation quality was not a factor i the selection of these books.

[17]These books are intended for 6-9 year-old children.

[18]These were counted by unique browser cookies.

[19]The Google Translate Research API: `http://research.google.com/university/translate/docs.html`

details, see Section 5.3). To prevent the evaluators' fluency judgment from being confounded by their accuracy judgment, evaluators used a tool which allowed them to first read the translation alone, rate its fluency, and then compare the translation to the original to rate its accuracy. The fluency and accuracy results (Figure 7.5 on page 145) showed that MonoTrans Widgets produced higher-quality translations compared to Google Translate.

Table 7.1: T-test p values for fluency and accuracy scores comparing matching sentences in Google Translate output and MonoTrans Widgets output. The small p values indicate that MonoTrans Widgets output has higher fluency and accuracy, and the difference is statistically significant. B1 and B2 are the bilingual evaluators.

Evaluator	Fluency	Accuracy
B1	$p = 0.047$	$p = 0.035$
B2	$p < 0.001$	$p = 0.025$

A pairwise t-test (Table 7.1) was conducted between fluency and accuracy ratings given to translations of the same sentence by the two systems. All the evaluators rated both the fluency and accuracy of the MonoTrans Widgets translations higher than the Google Translate translations, and all of these differences were statistically significant (p¡0.05).

On the very conservative criterion that a translation output is considered high quality only if both bilingual evaluators rated it a 5 for both fluency and accuracy (same as Section 5.3), Google Translate produced high quality output for 31% of the sentences, and MonoTrans Widgets improved this percentage to 52%. The results showed that MonoTrans Widgets significantly improved translation fluency and accuracy over machine translation alone, with only monolingual people involved.

In previous experiments (Section 5.3), MonoTrans2 improved the percentage of high quality sentences from Google Translate's 10% to 68%. However, the comparison between MonoTrans2 and MonoTrans Widgets are not strictly equivalent because the systems translated different materials between different language pairs. In addition, different users participated in the translation. The bottom-line message here is that while both systems yielded quality improvements without need for bilingual people, MonoTrans Widgets successfully engaged the casual ICDL users in a way that would not be possible with MonoTrans2.

7.4.2 Error category analysis

As discussed in Section 3.3.2, the crowdsourced monolingual translation protocol reduces machine translation errors. In order to understand how the protocol corrected translation errors, I compared the translation errors in machine translation output and MonoTrans Widgets output. Translation errors in machine translation output and MonoTrans Widgets output were classified into categories and compared within each category.

The error category analysis used categories defined in Vilar et al [69]. Only the first-level categories and their immediate sub-categories were used (see Figure 1 of [69]). Two native English speakers (also proficient in Spanish) labeled the translation errors in both the Google Translate output and the MonoTrans Widgets output. For reference, they were shown both the Spanish original and an English ground-truth translation (produced by bilingual ICDL volunteer translators[20]). The

[20]The bilingual translators did not use MonoTrans Widgets or MonoTrans2 to produce the

labelers were given Vilar et al [69] as instructions. They were told to use only the first two levels of the categories and to follow the instructions as closely as possible.

Table 7.2: Number of errors in Google Translate output (GT) and MonoTrans Widgets output (MW) in each category. Categories in which MonoTrans Widgets produced much fewer errors are bolded. "Not categorized" indicates that the labeler only labeled the error with a first-level category.

Category	Sub-category	Labeler 1		Labeler 2	
		GT	MW	GT	MW
Incorrect Words	Extra Words	8	10	6	5
	Incorrect Form	**10**	**5**	**5**	**2**
	Sense	**14**	**8**	**21**	**13**
	Style	5	4	0	0
	Total	37	27	32	20
Missing Words	Content Words	1	0	10	8
	Filler Words	2	0	3	0
	Not Categorized	**24**	**13**	0	0
	Total	27	13	13	8
Word Order	Phrase Level	3	2	1	0
	Word Level	2	2	3	2
	Not Categorized	6	5	0	0
	Total	11	9	4	2

Using Vilar et al [69] as instructions produced highly subjective labels. In particular, one labeler did not assign second-level labels for many errors. Therefore, no statistical analysis was conducted. However, the analysis of the labels was still informative. The analysis (see Table 7.2 on page 149) showed that the MonoTrans Widgets output contained fewer words with incorrect sense or incorrect form. This result was consistent with the discussion in Section 3.3.2.1 (page 49) in that these errors are all detectable errors (and that many of them are detectable and correctable errors).

translation. They translated the book as regular bilingual translators.

Without reference to the original meaning (by definition of monolingual tasks on the target side), monolingual target language speakers sometimes "overcorrected" errors that did not exist. For example, monolingual target language speakers filled in many missing words, and they even made excessive corrections in some cases, as there were more "extra words" errors in the MonoTrans Widgets output than in the Google Translate output (Table 7.2, Labeler 1).

Table 7.3: Examples of machine translation errors corrected by MonoTrans Widgets. These errors were labeled by both labelers. Only the segments of the sentences containing the errors are shown.

Original	*...todos en casa estaban muy felices.*
Ground Truth	...everybody in the house was very happy.
Google Translate	...all at home were very happy.
MonoTrans Widgets	...everyone at home was very happy.
Original	*...el ratón usa los dientes como ladrillos para hacer màs grande su casa...*
Ground Truth	...the mouse uses teeth as bricks to build a bigger house...
Google Translate	...the mouse uses the teeth as bricks for the bigger your house...
MonoTrans Widgets	...the mouse uses the teeth as bricks to build a bigger house...
Original	*En la mañana, cuando despertó...*
Ground Truth	When he woke up in the morning...
Google Translate	In the morning when he awoke...
MonoTrans Widgets	In the morning when he got up...

A closer look into each individual error showed that many "incorrect sense" or "incorrect form" errors were indeed corrected by MonoTrans Widgets. A few examples are given in Table 7.3 on page 150.

7.4.3 Examples of translation process

To further understand the translation process with MonoTrans Widgets, here I present two examples taken from the translation process of the Spanish book[21] into English by MonoTrans Widgets. The first example (Table 7.4 on page 153) is an example specifically selected to illustrate a successful translation, and the second example (Table 7.5 on page 154) is randomly chosen.

7.4.3.1 A selected example of successful translation

See Table 7.4 on page 153. The original sentence was "- *afirmó julio.*". It was a rather short sentence, but it was particularly interesting because it contained a typo (due to OCR errors): The person's name "*Julio*" was mistaken as "*julio*" which happens to be a legitimate Spanish word ("July"). This typo caused some confusion among the monolingual people, but turned out to be a vivid example of the protocol's error-correcting power.

Not surprisingly, the initial machine translation was "- Said in July." Although some source language speakers corrected the back-translation in ways that restored the correct meaning (rows #2 and #4), the target language speakers did not capture the correction (rows #5 to #11). It was not until later that some translation candidates with the correct meaning started to appear, but they were not voted up by enough people on both sides (rows #12, #17 and #20) to cause the process to terminate. After a number of edits by the target language speakers, another source

[21] What does the mouse want my tooth for?, Chévez and Chavarría, Fundación Libros para Niños, 2009

language speaker stepped in to provide another paraphrased source sentence (row #27), and it might have triggered the new paraphrase on the target side in which the verb "explained" was first introduced (row #28). Finally, a translation with the verb "explained" was voted as the best translation (row #30)[22].

This example illustrates how the interaction between source language speakers and the target language speakers recovered the intended original meaning by producing paraphrase. Interestingly, it even corrected the typo in the original sentence.

7.4.3.2 A random example

This example was randomly selected and turned out to be an unsuccessful one. Compared to the first example, this example did not converge on a correct translation (see Table 7.5 on page 154). The correct translation was indeed generated quite early on (row #8), but since votes were concentrated on an even earlier candidate (row #5) which appeared to be completely fluent, the correct translation was not chosen as the final translation. This shows that the translation protocol may converge with undetectable errors, which is again consistent with the discussion in Section 3.3.2.

[22]Nonetheless, the punctuation "-" was still not translated.

Table 7.4: A selected example of successful translation. The original sentence and the initial machine translation are shown on the top. Each following row is a translation candidate generated by either source-side paraphrasing ("→") or target-side editing ("←"), from earliest to latest. The shaded candidate is the one that received most votes. It is also the final translation shown at the bottom.

#	**Spanish (source)**		**English (target)**
Original	- afirmó julio.		(lit. [,]Julio stated.)
	- afirmó julio.	→	- Said in July. (machine translation)
1	- Dijo en julio.	←	- Said in July.
2	- Julio, dijo.	→	- Julio said.
3	- Dijo en julio.	→	- Said in July.
4	- Julio, dijo.	→	- Julio said.
5	Se dijo en julio.	←	It was said in July.
6	Se oyó, dijo en julio.	←	It was heard said in July.
7	"- Dijo en julio".	←	"- said in July."
8	- Dijo en julio.	←	- said in July.
9	"Ella dijo que en julio".	←	"She said in July."
10	- Dijo en julio.	←	- told in July.
11	- Dijo, "en julio".	←	- said, "in July."
12	- Dijo Julio.	←	- said Julio.
13	- Dijo en julio.	←	- she said in July.
14	- Dijo Emma en julio.	←	- said Emma in July.
15	dijo: "En julio".	←	said, "In July."
16	Fue en julio.	←	It was in July.
17	, Dijo Julio.	←	Said Julio.
18	Dijo que en julio.	←	He said in July.
19	, dijo Julio.	←	said July.
20	, dijo Julio.	←	said Julio.
21	Se dijo en julio. Lo dijo en julio.	←	It was said in July. They said it in July.
22	- Mencionado en el mes de julio.	←	- mentioned in July.
23	dijo en julio.	←	said in July.
24	Como se decidió en julio.	←	As was decided in July.
25	- Dijo Julio.	←	- said July.
26	dijo en julio.	←	said in July.
27	, dijo Julio.	→	said Julio.
28	Explicó Julio.	←	Explained Julio .
29	Julio dijo.	←	Julio said.
30	**Julio explicó.**	←	**Julio explained.**
31	explicó junior	←	explained Junior
32	, Dijo Julio.	←	, Julio said.
33	"Julio dijo"	←	"Julio said"
34	Julio-gritó a su novia	←	julio cried for his girlfriend
35	Julio dijo	←	Julio said
Final Translation: : Julio explained.			

Table 7.5: A random example. The original sentence and the initial machine translation are shown at the top. Each following row is a translation candidate generated by either source-side paraphrasing ("→") or target-side editing ("←"), from earliest to latest. The shaded candidate is the one that received most votes. It is also the final translation shown at the bottom.

#	**Spanish (source)**		**English (target)**
Original	¡Sillas para sus alumnos, porque es maestro!		(lit. Chairs for his students, because he is a teacher!)
	¡Sillas para sus alumnos, porque es maestro!	→	Chairs for their students, because it is perfect! (machine translation)
1	Sillas para sus alumnos, porque es perfecta!	←	Chairs for their students, because it is perfect!
2	Sillas para los estudiantes porque es perfecta!	→	Chairs for students because it is perfect!
3	Elegir sillas para los alumnos, ya que son perfectos.	←	Choose chairs for the students, because they are perfect.
4	Sillas para sus alumnos, porque es perfecto!	←	Chairs for their students because, it is perfect!
5	**Elija las sillas para sus alumnos, porque son perfectos!**	←	**Choose chairs for their students, because they are perfect!**
6	Elegir sillas para sus alumnos, ya que son perfectos!	←	Choose chairs for their students because they are perfect!
7	Sillas para sus alumnos, porque son perfectos!	←	Chairs for their students, because they are perfect!
8	Sillas para sus alumnos, porque l es un maestro!	←	Chairs for his students, because he is a teacher!
9	Es perfecto porque no hay sillas para los alumnos!	←	It is perfect because there are chairs for the students!
10	Sillas para sus alumnos, ya que es perfecto!	←	Chairs for their students because it is perfect!
11	Para hacer sillas para los estudiantes porque son perfectos!	←	To make chairs for students because they are perfect!
12	"Sillas para los estudiantes lo hacen perfecto!"	←	"Chairs for their students make it perfect!"
13	"Sillas para los estudiantes, ya que, es perfecto!"	←	"Chairs for their students because, it is perfect!"
14	Sillas para los estudiantes, porque es un maestro!	←	Chairs for their students, because it's a teacher!
15	Elegir sillas para los alumnos, ya que son perfectos!	←	Choose chairs for the students, because they are perfect!
16	Las sillas para los estudiantes son perfectos!	←	The chairs for the students are perfect!
17	"Sillas para los estudiantes, ya que es perfecto!"	←	"Chairs for their students, because it's perfect!"
18	Elegir sillas para los alumnos, ya que tienen que ser perfecto!	←	Choose chairs for the students, because they need to be perfect!
19	Tenemos que elegir sillas para los alumnos. Estos son perfectos!	←	We need to choose chairs for the students. These are perfect!
20	Se los utiliza para construir sillas para sus alumnos, ya que son perfectos para el trabajo!	←	He uses them to build chairs for his students because they are perfect for the job!
21	permite elegir las sillas de sus alumnos, porque son realmente perfecto!	←	lets Choose chairs for their students, because they are really perfect!
22	Elija las sillas para sus estudiantes, ya que son perfectos! Y bueno	←	Choose chairs for their students, because they are perfect! and good
23	Aplausos para sus estudiantes, ya que es perfecto!	←	Cheers for their students, because it is perfect!
24	Ellos eligieron las sillas porque eran perfectos para los estudiantes.	←	They chose the chairs because they were perfect for the students.
25	Ellos eligieron las sillas perfecto para sus estudiantes.	←	They chose the perfect chairs for their students.
Final Translation: : Choose chairs for their students, because they are perfect!			

7.4.4 The feedback loop as a clarification dialog

As discussed in Section 3.2, the feedback loop supports a dialog between monolingual crowds. According to Gabsdil et al [18] and Clark et al [10], clarification dialogs help to create common ground in human communication. Although research on clarification dialogs (especially in automatic question-answering systems) has focused on monolingual situations (in which both the requester and the responding machine use the same language) [18], I use its concepts here to analyze some translation cases in the data collected through MonoTrans Widgets. Using the clarification theory, the feedback loop can be seen as a clarification dialog between the source language speakers and the target language speakers. In this dialog, the source language speakers clarify phrases that the target language speakers highlighted; the source language speakers also confirm the best translation candidate that the target language speakers generated.

The data collected with MonoTrans Widgets contained both successful clarification dialogs and cases where clarification dialogs may fail. In this section, I discuss some examples to illustrate the properties of successful clarification dialogs.

First of all, clarification from the source side should be robust against unreliable machine translation. In Table 7.6 (page 158), the subject was omitted in the original sentence, and the resulting machine translation was in imperative mood. The source language speakers added a third-person pronoun ("*se*") to clarify, and the translated sentence contained the correct segment ("he put").

In fact, the segment "*se puso*" was the result of back-translation from an earlier

translation candidate, and this suggests that using phrases generated by the machine (back-)translation may lead to source sentences that are "easier to translate" for the machine translation engine and thus may result in better translations in the target language.

Even if correctly translated, clarification from the source side should also match the receivers' world knowledge to be accepted on the target side. Table 7.7 (page 158) shows an example where the correct machine translation was rejected by the target language speakers. In this example, "teeth" in the machine translation was the correct translation of "*dientes*" in the source sentence, but it was changed by the target language speakers into "fish". I conjecture that with the widget design, some target language speakers did not have enough context about the story being translated (which is about a child's tooth) and therefore could only resort to their world knowledge in which "ocean" (appeared earlier in the sentence) was more relevant to "fish" than "teeth".

The mistranslation from "teeth" to "fish" was also consistent with the "undetectable" error type discussed in Section 3.3.2.1 (page 49). When a translation error (such as this one) is consistent with the target language users' world knowledge, it is unlikely to be detected on the target side. To counterbalance monolingual speakers' world knowledge when it is inconsistent with the translation context, it may be helpful for the machine translation engine to indicate that translating "*dientes*" into "teeth" is much more likely than translating it into "fish", i.e, showing the target language speakers a confidence score along with the translated phrase. This also implies that there is a trade-off between the simplicity of the widgets and translation

context, as discussed in Section 7.2.1 (page 135).

Finally, for the source language speakers to confirm that the error has indeed been corrected, target-side edits should be back-translated well. Table 7.8 (page 159) shows an example of unreliable back-translation. In this example, the correct translation in the target language ("everyone at home was") resulted in an incorrect back-translation ("*todo el mundo en casa estaba*"), whereas the *incorrect* translation ("everyone at home were") had a back-translation ("*todos en casa estaban*") that better matched the original meaning.

Spurious back-translation is a more subtle issue, and more discussion is in Section 3.2.3 (page 43). In general, the crowdsourced monolingual translation protocol addresses this problem with redundant human efforts.

Table 7.6: Example of source-side rephrasing that is robust to machine translation errors.

Original sentence	*...**metió** debajo de la almohada los dientes postizos de la abuela y se durmió...*
Ground truth	...**he put** his grandmother's dentures under the pillow and fell asleep...
Machine translation	...**put it** under your pillow the grandmother's dentures and fell asleep...
Edited (source side)	*...**se puso** la dentadura postiza de su abuela debajo de la almohada y se durmió...*
Machine translation	...**he put** his grandmother's false teeth under the pillow and fell asleep...

Table 7.7: Example of target-side edits with mismatched context.

Original sentence	*¡Un puente para ir al otro lado del ocano y buscar ms **dientes**!*
Ground truth	A bridge to go across the ocean and look for more **teeth**!
Machine translation	A bridge to go across the ocean and look for more **teeth**!
Edited (target side)	Let's make a bridge over the sea, so we can find more **fish**!

Table 7.8: Example of incorrect back-translation.

Original sentence	*...**todos en casa estaban** muy felices.*
Ground truth	...**everyone at home was** very happy.
Correct traslation	...**everyone at home was** very happy.
Back-traslation	*...**todo el mundo en casa estaba** muy feliz.*
Incorrect traslation	...**everyone at home were** very happy.
Back-traslation	*...**todos en casa estaban** muy contentos.*

7.5 Design Lessons

During the development and deployment of MonoTrans Widgets, I learned some important design lessons which might be helpful to designers of other crowdsourcing systems, especially these that draw input from crowds with different skills.

7.5.1 Balance between crowds

As mentioned in Section 7.2.3, maintaining a balance among languages is a special issue worth discussion of its own. This issue did not arise during the previous user studies, but only appeared with the real-world crowds that MonoTrans Widgets worked with.

Naturally, the ICDL user population is unevenly distributed in terms of languages spoken. Among the ICDL users, English speakers are the majority, followed by Spanish speakers, and the German-speaking population is very small (Table 7.9).

Table 7.9: Number of MonoTrans Widgets users by browser language (Sep 5-Sep 18, 2011).

Language	Population
English	10,120
Spanish	1,431
German	170

This imbalance caused some unexpected issues. Early in the deployment, I observed a disproportionately low throughput for German-Spanish tasks. The reason, quite surprisingly, was neither the German speakers nor the Spanish speakers, but the vast majority of English speakers. The MonoTrans Widgets system initially did

not prioritize tasks according to speaker population. Therefore, the Spanish speakers were overwhelmed by English-Spanish tasks that the English speakers completed (thus needed response from the Spanish speakers), so no Spanish speaker was available for any Spanish-German task. The same was true for the German speakers, so no worker was available for tasks between the less-spoken Spanish and German as they were all dragged towards tasks translating to or from English.

Since there are always "more than enough" English speakers and not enough German speakers, some Spanish speakers should be allocated to collaborate with the German speakers first. To maintain balance among translations between different languages, the sentence prioritization algorithm (Section 7.2.3.1) was adjusted to assign a higher priority to sentences whose source and/or target language was less common, based on the *a priori* knowledge of the language distribution in ICDL (see Algorithm 7.3 on page 141, the added part is line 12-16).

If both the source and the target languages of a sentence were uncommon, the algorithm gave the sentence an even higher priority.

Such adjustment helped to maintain balance among different languages, as tasks between German and Spanish were no longer preempted by English tasks. The general design lesson for building similar crowdsourcing systems is that in crowdsourcing systems that involve multiple crowds, task assignment should favor the smallest crowd because it is often the bottleneck of throughput.

7.5.2 Prepare for scanning

During the experiment with MonoTrans Widgets, I observed a roughly 5:1 skipping/submitting ratio: users skipped or "flipped through" five times more tasks than they performed and submitted. Since the system needed to perform task assignment for every task viewed, and the major overhead for task assignment was sentence prioritization, I optimized task assignment by using and caching sentence priority scores. Caching priority scores allowed faster scanning performance. The lesson here is that in a system where users quickly browse some tasks before committing to finishing one, rendering of the task view should be optimized so that page response time is very low.

7.6 Discussion

The translation examples (Section 7.4.3) showed many more target-side edits than source-side edits; the results in the error category analysis (Section 7.4.2) also implied that more errors corrected by the system were detectable and correctable errors, the errors that the target language speakers can handle by themselves.

While these results shed some light on the fine-grained behavior of the protocol, they are biased by the uneven language distribution among the ICDL users (Section 7.5.1). Since there are many more English speakers than speakers of other languages among the ICDL users, and since the book used in both the translation examples and the error category analysis was translated from Spanish to English, the results' inclination towards target language speakers may just be the side effect

of a disproportionately large English speaking population on ICDL.

Unlike controlled experiments, deploying within the ICDL site did not allow any demographic control as would be available in lab experiments. For example, there was no way to recruit only strictly monolingual users. For this research, I specifically designed the widgets to only show tasks in one language. This design guaranteed users to be effectively monolingual.

Nevertheless, deploying to the ICDL user population did help the MonoTrans Widgets avoid some problems. For example, there was very little spam or irrelevant user input. This is not common among crowdsourcing system deployed to other populations (e.g., Mechanical Turk workers [67]). Better quality control will need to be taken into account when deploying to other user populations.

The widget design was an attempt to engage more casual users without an explicit incentive. Although this chapter implied that task simplicity and user motivation are competing goals, it goes without saying that all crowdsourced tasks should be small. In fact, recent research showed that a complex task (much like MonoTrans2) can be supported by focusing users' attention to its different parts and phases [77]. However, that alternative approach presented required substantial monetary incentive.

7.7 Summary

In this chapter, I presented the findings from deploying MonoTrans Widgets "in the wild". By introducing micro-tasks, MonoTrans Widgets were able to be

deployed within the ICDL web site, and to be used by its many daily visitors. A comparison to machine translation showed that the MonoTrans Widgets can obtain significantly improved quality with little context provided to the users. A closer look into the translation process as well as the errors that were corrected by MonoTrans Widgets confirmed that the crowdsourced monolingual translation protocol can correct different types of translation errors via the interaction between source language speakers and target language speakers. I also discussed design lessons that may be valuable to other crowdsourcing system designers in general.

Chapter 8

Conclusions

To explore supporting unskilled humans in crowdsourcing, this dissertation presented crowdsourced monolingual translation, a new translation method that combines machine translation and crowds of people who only speak the source or the target language, but not both.

The previous chapters (Chapters 3-7) discussed the crowdsourced monolingual translation protocol and three systems that implemented this protocol. Each system was built on top of the previous system to solve a bigger problem. First, MonoTrans (Chapter 4) established the feasibility of the protocol through a small-scale study; MonoTrans2 (Chapter 5) expanded the protocol's application not only to a larger group of participants, but also to participants who do not speak English, in a very different technological (and social) environment; finally, the MonoTrans Widgets system (Chapter 7) was deployed "in the wild" to real-world casual web users.

The tasks performed by users also evolved with each system. MonoTrans assumed that users had a clear understanding of the translation protocol; MonoTrans2 provided contextual instructions for each step of the process, but it still required an understanding of the protocol to some extent; with MonoTrans Widgets, this expectation was totally removed. With MonoTrans and MonoTrans2, users chose sentences to work on; with MonoTrans Widgets, they were assigned sentences to

work on by the system. The lesson learned through this evolution is that in order to engage a large crowd of users, a crowdsourcing system should minimize the burden on its users and make the tasks as simple as possible.

8.1 Summary of Findings

In Chapter 1, I put forward three hypotheses:

1. **H1:** Crowdsourced monolingual translation, a protocol supporting collaboration among monolingual people, performs better than machine translation and monolingual post-editing in terms of translation quality.

2. **H2:** The feedback loop improves translation quality.

3. **H3:** Overall, using annotations during the translation process improves translation quality; each type of annotation also improves translation quality.

H1 was found to be true in chapters 5, 6 and 7. Chapter 5 showed that MonoTrans2 performed better than monolingual post-editing when translating children's books. On a 5-point accuracy scale, there was a 0.30-point average improvement ($p < 0.001$). At the same time, accuracy improvement obtained by monolingual post-editing over machine translation was not significant.

Systems that implemented crowdsourced monolingual translation also performed better than machine translation alone. Chapter 5 showed that MonoTrans2 performed better than machine translation when translating children's books. With

MonoTrans2, the percentage of high quality sentences improved from 10% to 68%.[1] Chapter 5 showed that MonoTrans2 performed better than machine translation when translating emergency response text messages from Haitian Creole into English. With MonoTrans2, the percentage of high quality sentences improved from 25% to 38%.[2]

In addition, the MonoTrans Widgets system was deployed on the ICDL website for 9 months. It translated 11 books into five languages.[3] MonoTrans Widgets performed better than machine translation when translating children's books. MonoTrans Widgets improved the percentage of high quality sentences from machine translation's 31% to 52%.[4] (Chapter 7)

Studies did not confirm H2 with statistical significance due to the difficulty in recovering the feedback process from data collected with systems that used the asynchronous interaction model (Section 3.2.4, page 45). However, preliminary analysis in Section 7.4.4 (page 155) still showed that the feedback loop may improve translation quality if it forms a successful clarification dialog.

Regarding H3, Section 5.4 (page 95) confirmed that using annotations during the translation process improves translation quality. Among all the annotation types analyzed, paraphrases and picture improved translation quality. However,

[1]The criterion was that a translation is high quality only when it is highly fluent and highly accurate.

[2]The criterion was that a translation is high quality when it is highly accurate.

[3]These books contain 3,600 words. Had a translation service been hired to translate them, at $0.25 per word, the translation of books into five languages would have cost $4,500.

[4]The criterion was that a translation is high quality only when it is highly fluent and highly accurate.

part of H3 was not confirmed. In particular, explanations with templates did not improve translation quality (Section 5.4, page 95). A possible explanation is that the predefined templates did not provide monolingual participants with a chance to add new clarifying content.

In addition to confirming the hypotheses, analyses in Sections 7.4.2 and 7.4.4 (page 148 and page 155) also show that the protocol performs better when the errors are detectable, and that its error-correcting ability decreases with non-detectable errors. This conclusion is consistent with the discussion in Section 3.3.2.1 (page 49).

8.2 Discussions and Future Work

There are many open questions and much room for improvement for the crowdsourced monolingual translation protocol. In this section, I discuss new methods to implement the protocol and development of similar crowdsourcing systems in other domains.

8.2.1 Study and improvement of protocol

The three systems discussed in this dissertation were just the initial exploration into the crowdsourced monolingual translation protocol. There is still much to be done regarding understanding and improving the protocol itself.

8.2.1.1 Tighter integration with machine translation

All the systems in this dissertation used an off-the-shelf machine translation engine.[5] The machine translation engine was convenient and could translate between many language pairs, but its output was limited to either the n-best list (the best n translation candidates given a source sentence) or 1-best translation with word alignments. A more open machine translation engine which allows access to more of its internal features would provide more ways to further integrate machine translation into the protocol and save human effort.

In terms of generating paraphrases, current systems relied on source language speakers. To generate these paraphrases, participation on the source side is necessary. The systems then translated and project the paraphrases onto the target side. Source side participation can be skipped, however, if the machine translation engine provides access to alternative translations of phrases on the target side. As the Linear B system showed [7], target language speakers alone can improve translation quality if they can choose from paraphrases of target text. Another method to automatically provide target language speakers with more options is to display to them the n-best list. This method may be more direct and easier to implement. However, since neighboring candidates in the n-best list sometimes differ very little, care should be taken to only show candidates that are sufficiently different from each other.

The idea of using machine translation engine to automatically generate para-

[5]The engine was Google Translate and its Research API.

phrases aims to minimize effort for source-side paraphrasing. A different improvement to the system would be to maximize the impact of source-side paraphrasing by integrating source-side paraphrases directly into the machine translation engine. Source-side paraphrasing generates a large set of paraphrases for the original source sentence at two levels: When the source language speakers correct a back-translation, they are in effect generating a sentence-level paraphrase; when they provide an textual explanation to an phrase marked as translation errors, they are generating a phase-level paraphrase. Our own research showed that by providing the machine translation engine with multiple versions of the source sentence (sentence-level paraphrases) and choosing the best translation, machine translation quality can be improved [6]. A machine translation engine which uses lattice input [14] would also be very useful: Instead of taking a source sentence as the input, such a translation engine would take into account all the paraphrases of the source sentence, and thus may generate better translation.

A third way to better use machine translation was discussed in Section 7.4.4 (page 155). The system can show target language speakers each phrase's confidence in the machine translation. Doing so may compensate for the mismatch between the target language speakers' world knowledge and the translation context. It may also help people to better focus on the phrases that are more likely to be mistranslated by machine translation.

Integration with the machine translation engine was part of this dissertation's initial research plan. However, the first system, MonoTrans, used a synchronous interaction model which required a low latency our in-house machine translation

engine was not able to provide. The latency requirement was relaxed with the asynchronous model used in MonoTrans2 and MonoTrans Widgets, but an integration with the in-house machine translation engine did not fit into the time frame of this dissertation.

8.2.1.2 Alternative implementations

The stopping condition in MonoTrans2 (Chapter 5) and MonoTrans Widgets (Chapter 7) used a constant number of votes for a translation candidate to be accepted. In fact, translation processes analyzed with MonoTrans Widgets showed that such stopping condition might not be optimal. As alternative, adaptive stopping conditions may be used. For example, the system may compare the translation candidates generated over time and automatically stop the translation process if only slight changes are made to generate newer candidates.

All the systems in this dissertation used an off-the-shelf machine translation engine.[6] Of course, this is not the only way to implement the crowdsourced monolingual translation protocol.

As discussed in Section 8.2.1.1, tighter integration between human edits and the machine translation engine can be developed. On the other hand, the translation channel does not have to be an automatic machine translation engine at all. As long as a mechanism provides 1) translation in both directions and 2) word-level alignments, it can be used in the protocol as the translation channel. For example, a group of amateur bilingual translators (as in [76]) can also serve as the translation

[6]The engine was Google Translate and its Research API.

channel.

In all current systems, translations of the same source material into different target languages are separate. This is a waste of human effort, especially on the source side, as the source language speakers may be answering the same questions raised by speakers of different target languages.

An improved design of the translation system would consider the interaction between target languages. For example, all the source-side annotations can be automatically translated into all the target languages. In the spirit of shared context and redundancy, the system may also show the target language speakers translations in other target languages (much like Ackuna, an online translation community for bilinguals) so the target language speakers may take advantage of their own bilingual knowledge, even though they do not speak the source language.[7]

8.2.1.3 External incentives

In MonoTrans, MonoTrans2, and especially in MonoTrans Widgets, great effort was taken to engage more casual users. However, the problem of engaging users may be solved independently and more directly by introducing external incentives.

For example, online labor markets such as the Amazon Mechanical Turk can be used to recruit monolingual people, who are then directed to MonoTrans Widgets as workers.[8]

Using Mechanical Turk to recruit workers is our own ongoing research. How-

[7]The Ackuna online translation community is at: `http://ackuna.com/`.

[8]The Amazon Mechanical Turk is at: `http://mturk.com`

ever, as discussed earlier in Section 7.6, much care must be given to quality control with workers on Mechanical Turk. In our earlier experiment in which Mechanical Turk workers were recruited to give phrase-level paraphrases on the source side ("targeted paraphrases" [6]), Mechanical Turk workers generated a considerably higher percentage of nonsense input than the input from the ICDL users. Therefore, a system which recruits online workers may need extra verification steps, as suggested by Little et al [46].

8.2.2 New designs of crowdsourcing systems

Although this dissertation only explored translation, the motivating principle behind crowdsourced monolingual translation is that crowds can be linked together by a feedback loop, and that the communication between crowds can enable them to complete more complex tasks and to improve output quality.

This general idea can easily be applied to domains besides translation. For example, in a system that employs sighted people to provide photo-to-text recognition for visually impaired people (such as VizWiz [5]), simple feedback such as whether text is well-positioned in the photo can greatly improve the recognition results. In fact, in every crowdsourcing system where there is a crowd of workers and a crowd of end-users, it is possible to introduce such a feedback loop.

This new design also opens up an interesting opportunity for crowdsourcing systems: tasks are no longer dependent on a single worker crowd with a certain skill. On the other hand, it also poses several new problems, such as coordinating between

multiple crowds. To this end, MonoTrans Widgets represents an attempt to solve these problems through task prioritization based on crowd size. (See Section 7.5.1).

8.3 Final Remarks

Finally, it is important to note that the goal of crowdsourced monolingual translation is not to replace professional translators, or even bilingual humans, but rather to remove for them the unnecessary burden of translating every sentence and to direct their effort to where it would help the most–the parts that even computer and monolingual humans combined cannot correctly translate.

Appendix A

MonoTrans Widgets Data

This appendix lists a children's book translated from Spanish into English during the deployment of MonoTrans Widgets on the International Children's Digital Library (ICDL). More details of the deployment is discussed in Section 7.3 (page 143).[1]

Table A.1: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 5.

#	**Spanish (source)**		**English (target)**
Original	Cuando a Alfredo se le cayó su primer diente, todos en casa estaban muy felices.		
	Cuando a Alfredo se le cayó su primer diente, todos en casa estaban muy felices.	→	Alfredo When you lost your first tooth, all at home were very happy. (machine translation)
1	Alfredo Cuando cayó su primer diente, todos en casa estaban muy contentos.	←	Alfredo When you lost your first tooth, all at home were very happy.
2	Alfredo, cuando se le cayó su primer diente, todo el mundo en casa estaba muy feliz.	←	Alfredo, when you lost your first tooth, everyone at home was very happy.
3	Alfredo, cuando se le cayó su primer diente, todos en casa estaban muy contentos.	←	Alfredo, when you lost your first tooth, everyone at home were very happy.
4	Alfredo, cuando se le cayó su primer diente, todo el mundo estaba en éxtasis.	←	Alfredo, when you lost your first tooth, everyone was ecstatic.

[1]The book is *What does the mouse want my tooth for?*, at `http://www.childrenslibrary.org/icdl/BookPreview?bookid=campara_01040018&route=text&lang=English&msg=&ilang=English`.

5	Cuando Alfredo perdió su primer diente, todos en casa era muy feliz.	←	When Alfredo lost his first tooth, everyone at home was very happy.
6	Alfredo, cuando se le cayó su primer diente, todos en casa estaban muy a happy.for	←	Alfredo, when you lost your first tooth, everyone at home were very happy.for you
7	Alfreo, cuando se le cayó yourt casa fue v feliz.	←	Alfreo, when you lost yourt home was v happy.
8	Alfredo, cuando se le cayó su primer diente a todos en casa era muy feliz.	←	Alfredo, when you lost your first tooth everyone at home was very happy.
9	Alfredo, perdió su primer diente y todos en casa era muy feliz.	←	Alfredo, lost his first tooth and everyone at home was very happy.
Final Translation: Alfredo, when you lost your first tooth, everyone at home was very happy.			

Table A.2: Translation Data Collected with MonoTrans Widgets, sentence 1 on page 5.

#	**Spanish (source)**		**English (target)**
Original	-Ahora lo guardaremos para el ratón de los dientes!- le dijo su mamá-		
	-Ahora lo guardaremos para el ratón de los dientes!- le dijo su mamá-	→	- Now keep it for the tooth fairy! - Said his mother- (machine translation)
1	- Ahora lo guarde para el hada de los dientes - dijo su madre-	←	- Now keep it for the tooth fairy! - Said his mother-
2	- Ahora lo guarde para el hada de los dientes, dijo a su madre	←	-Now keep it for the tooth fairy! said his mother
3	Ahora lo guarde para el hada de los dientes -, dijo su madre-	←	Now keep it for the tooth fairy! - Said his mother-
4	- Ahora lo guarde para el hada de los dientes, dijo a su madre	←	- Now keep it for the tooth fairy! said his mother
5	- Ahora lo guarde para el hada de los dientes -, dijo su madre-	←	- Now keep it for the tooth fairy! - Said his mother-
6	- Ahora lo guarde para el hada de los dientes, dijo su madre	←	- Now keep it for the tooth fairy! Said his mother
7	Ahora lo guarde para el hada de los dientes!, Dijo su madre.	←	Now keep it for the tooth fairy! said his mother.
8	- Ahora, lo guarde para el hada de los dientes -, dijo su madre-	←	- Now, keep it for the tooth fairy! - said his mother-

9	Ahora lo guarde para el hada de los dientes!, Dijo su madre.	←	Now keep it for the tooth fairy! said his mother.
10	- Ahora lo guarde para el hada de los dientes, dijo a su madre	←	-Now keep it for the tooth fairy!, said his mother
11	- Ahora, tenga el diente para el hada de los dientes, dijo su madre	←	- Now keep your tooth for the tooth fairy! Said his mother
12	Ahora, lo guarde para el hada de los dientes!, Dijo su madre.	←	Now, keep it for the tooth fairy! said his mother.
13	Ahora lo guarde para el hada de los dientes, dijo su madre.	←	Now keep it for the tooth fairy! Said his mother.
14	- Ahora lo guarde para el hada de los dientes! - Dijo su madre .-	←	- Now keep it for the tooth fairy! - said his mother.-
15	Ahora lo guarde para el hada de los dientes, dijo su madre	←	Now keep it for the tooth fairy! Said his mother
16	Ahora lo guarde para el hada de los dientes!, Dijo a su madre	←	Now keep it for the tooth fairy! said his mother
17	Ahora lo guarde para el hada de los dientes!, Dijo su madre.	←	Now keep it for the tooth fairy! said his mother.
18	Ahora, lo guarde para el hada de los dientes!, Dijo su madre.	←	Now, keep it for the tooth fairy! said his mother.
19	- Ahora lo guarde para el hada de los dientes, dijo su madre.	←	- Now keep it for the tooth fairy!, said his mother.
20	Ahora lo guarde para el ratón hada de los dientes!, Dijo su madre.	←	Now keep it for the tooth fairy mouse! said his mother.
21	- Ahora lo guarde para el hada de los dientes, dijo su madre.	←	-Now keep it for the tooth fairy! said his mother.
22	- Ahora lo guarde para el ratón hada de los dientes, dijo su madre	←	- Now keep it for the tooth fairy mouse! Said his mother
23	Ahora lo guarde para el hada de los dientes!, Dijo su madre.	←	Now keep it for the tooth fairy! said his mother.
24	Ahora lo guarde para el hada de los dientes, dijo su madre.	←	Now keep it for the tooth fairy!, said his mother.
25	Ahora, lo guarde para el hada de los dientes, dijo a su madre	←	Now, keep it for the tooth fairy!, said his mother
26	Ahora lo guarde para el hada de los dientes., Dijo su madre.	←	Now keep it for the tooth fairy.said his mother.
27	- Ahora lo guarde para el hada de los dientes, dijo su madre.	←	- Now keep it for the tooth fairy! Said his mother.
28	Ahora lo guarde para el hada de los dientes, dijo su madre.	←	Now keep it for the tooth fairy, said his mother.
29	Ahora lo guarde para el hada de los dientes, dijo su madre.	←	Now keep it for the tooth fairy! Said his mother.

30	- Ahora lo guarde para el hada de los dientes, dijo su madre	←	-Now keep it for the tooth fairy! Said his mother
31	Ahora lo guarde para el hada de los dientes!, Dijo su madre	←	Now keep it for the tooth fairy! Said his mother
32	Ahora lo guarde para el Hada de los Dientes, dijo su madre.	←	Now keep it for the Tooth Fairy! said his mother.
33	- Ahora es mantener y darle a la hada de los dientes, dijo su madre	←	- Now keep it and give it to the tooth fairy! Said his mother
34	- Ahora bien, este seguro para el hada de los dientes, dijo a su madre	→	- Now this safe for the tooth fairy, said his mother
35	- Ahora bien, esto es seguro que el hada de los dientes, dijo su madre.	←	- Now this is safe for the tooth fairy, said his mother.
36	- Ahora es seguro que el hada de los dientes, dijo a su madre	←	- Now it is safe for the tooth fairy, said his mother
37	- Ahora es salvado por el hada de los dientes, dijo su madre.	←	- Now it saved by the tooth fairy, said his mother.
38	- Ahora bien, esto está listo para el hada de los dientes, dijo su madre.	←	- Now this is ready for the tooth fairy, said his mother.
39	- Ahora bien, esto es seguro para el ratoncito Pérez, dijo su madre.	←	- Now this is safe for the fairy tooth, said his mother.
40	Vamos a salvar a este de la hada de los dientes, dijo su madre.	←	We will save this for the tooth fairy, said his mother.
41	- Ahora es seguro que el hada de los dientes, dijo a su madre	←	- Now it is safe for the teeth fairy, said his mother
42	Ahora es seguro para el Hada de los Dientes, dijo su madre.	←	Now it is safe for the Tooth Fairy, said his mother.
43	Ahora está listo para el hada de los dientes , dijo su madre.	←	Now it is ready for the tooth fairy, said his mother.
44	como lo es con los extranjeros	←	as it is with strangers
45	- Ahora bien, esto es seguro que el hada de los dientes, dijo su madre.	←	- Now this is safe for the tooth fairy, said his mother.
46	Ahora es seguro que el hada de los dientes, dijo su madre.	←	Now it is safe for the tooth fairy, said his mother.
47	- Ahora es seguro que el hada de los dientes, dijo su madre.	←	- Now it is safe for the tooth fairy, said his mother.
48	- Ahora es seguro que el hada de los dientes por venir, dijo su madre en silencio	←	- Now it is safe for the tooth fairy to come, said his mother quietly

49	- Ahora es seguro con el hada de los dientes, dijo a su madre	←	- Now it is safe with the tooth fairy, said his mother
50	- Ahora es seguro que el hada de los dientes, dijo a su madre	←	- Now it's safe for the tooth fairy, said his mother
51	Ahora bien, esto es seguro que el hada de los dientes, dijo su madre.	←	Now this is safe for the tooth fairy, said his mother.
52	- Ahora, esto es seguro para el Hada de los Dientes, dijo su madre.	←	- Now, this is safe for the Tooth Fairy, said his mother.
53	Ahora es seguro que el hada de los dientes, dijo a su madre	←	Now it is safe for the tooth fairy, said his mother
54	- Ahora es seguro que el hada de los dientes, dijo su madre.	←	- Now it is safe for the tooth fairy, said her mother.
55	Ahora es seguro que el hada de los dientes, dijo su madre, mientras ella se coló de con $ 200 dólares.	←	Now it is safe for the tooth fairy, said his mother, While she snuck of with $200 dollars.
56	Ahora bien, esto es seguro que el hada de los dientes, dijo su madre, como se puso el diente debajo de la almohada	←	Now this is safe for the tooth fairy, said his mother, as she put the tooth under the pillow
57	Ahora es seguro que el hada, dijo a su madre	←	Now it is safe for the fairy, said his mother
58	- Ahora es seguro que el hada de los dientes, dijo a su madre para obtener	←	- Now it is safe for the tooth fairy, said his mother to get
59	- Ahora está a salvo de la hada de los dientes, dijo a su madre	←	- Now it is safe from the tooth fairy, said his mother
60	- Ahora, esto es seguro para el hada de los dientes, dijo su madre.	←	- Now, this is safe for the tooth fairy, said his mother.
61	- Noit es, dijo a su madre	←	- Noit is , said his mother
62	-Su madre dijo que este es seguro para el hada de los dientes.	←	-His mother said this is safe for the tooth fairy.
63	los libros de ficción sobre Holanda y Estados Unidos por s de 5 aos de edad y menores	←	fictional books about holland and america for 5 year old s and under
64	La historia del libro	←	History book
65	- Ahora es seguro que el hada de los dientes, dijo a su madre	←	- Now it is safe for the tooth fairy, said his mother
66	- . Ahora, el hada de los dientes puede venir, dijo a su madre	←	- Now the tooth fairy can come. said his mother

67	- Ahora es seguro que el hada de los dientes, dijo a su madre	←	- Now it is safe for the tooth fairy said his mother
68	- Ahora mantenerlo a salvo de la hada de los dientes, dijo su madre.	←	- Now keep it safe for the tooth fairy, said his mother.
69	Ahora es seguro que el hada de los dientes, dijo su madre.	←	Now it is safe for the tooth fairy, said his mother.
70	- Ahora es seguro para el hada de los dientes, dijo su madre.	←	- Now it's safe for the tooth fairy, said his mother.
Final Translation: - Now this is safe for the tooth fairy, said his mother.			

Table A.3: Translation Data Collected with MonoTrans Widgets, sentence 2 on page 5.

#	**Spanish (source)**		**English (target)**
Original	Alfredo primero se alegró y después se preguntó:		
	Alfredo primero se alegró y después se preguntó:	→	Alfredo was happy first and then asked: (machine translation)
1	Alfredo era feliz primero y luego preguntó:	←	Alfredo was happy first and then asked:
2	Alfredo fue feliz al principio y luego preguntó:	→	Alfredo was happy at first and then asked:
3	Alfredo era feliz primero y después de un rato preguntó:	→	Alfredo was happy first and after a while he asked:
4	Al principio, Alfredo era feliz, pero luego se preguntó:	←	At first Alfredo was happy, but then he asked,
5	Al principio, Alfredo era feliz, pero luego se preguntó: Dónde está mi pelota?	←	At first, Alfredo was happy, but then he asked, Where is my ball?
6	Al principio, Alfredo era feliz, pero luego se preguntó:	←	At first, Alfredo was happy, but then he asked,
7	Al principio, Alfredo era feliz, pero pidió	←	At first Alfredo was happy, but then asked,
8	Al principio, Alfredo fue feliz, pero luego me preguntó,	←	At first, Alfredo was happy but then he asked,
9	Al principio, Alfredo era feliz, pero luego se preguntó:	←	At first, Alfredo was happy, but then he asked,
10	Al principio, Alfredo era feliz, pero pidió	←	At first Alfredo was happy, but then asked,
11	Al principio Alfredo estaba encantado, pero de una manera curiosidades preguntó,	←	At the beginning Alfredo was elated, but then in a curios manner, asked,

12	Al principio, Alfredo era feliz, pero luego me preguntó?	←	At first Alfredo was happy, but then he asked?
13	Al principio, Alfredo fue feliz, pero pidió	←	At first, Alfredo was happy but then asked,
14	Al principio, Alfredo estaba feliz pero luego se preguntó:	←	At first Alfredo was happy but then he asked,
15	Al principio, Alfredo era feliz, pero luego preguntó: qué pasaría si el ratón se encuentra por primera vez?	←	At first Alfredo was happy, but then asked, what if the mouse finds it first?
16	Bonjour	←	bonjour
17	Al principio, Alfredo era feliz, pero más tarde le preguntó:	←	At first Alfredo was happy, but later he asked,
18	Alfredo fue feliz al principio, pero luego se preguntó:	←	Alfredo was happy at first , but then he asked,
19	Al principio, Alfredo era feliz, pero pidió:	←	At first Alfredo was happy, but then asked :
20	Al principio, Alfredo era feliz, pero pidió	←	At first Alfredo was happy, but then asked
21	Al principio, Alfredo era feliz, pero luego me preguntó	←	At first Alfredo was happy, but then he asked
22	Al principio, Alfredo era feliz, pero luego me preguntó,	←	At first Alfredo was happy, but then he asked,
23	En un primer momento, Alfredo era feliz, pero, luego me preguntó,	←	At first, Alfredo was happy, but, then he asked,
24	Al principio, Alfredo era feliz, pero luego preguntó: Por qué la dosis Toth vienen	←	At first Alfredo was happy, but then asked, why dose the toth come
25	Al principio, Alfredo era feliz, pero luego me preguntó: Eres un vagabundo ?!?!?!	←	At first Alfredo was happy, but then he asked, ARE YOU A HOBO?!?!?!
26	Al principio, Alfredo era feliz, pero luego preguntó: cómo git aquí	←	At first Alfredo was happy, but then asked, how did you git here
27	Alfredo se alegró antes de preguntar:	→	Alfredo was glad before asking:
28	Alfredo era feliz antes de preguntar:	←	Alfredo was happy before asking:
29	Alfredo se alegró antes de preguntar.	←	Alfredo was glad before asking.
30	Alfredo se sintió mejor antes de preguntar.	←	Alfredo was felt better before he asked.

31	Alfredo era feliz antes de preguntar:	←	Alfredo was happy before asking,
32	Alfredo era feliz antes de preguntar,	←	Alfredo was happy before he asked,
33	Alfredo preguntó alegremente:	←	Alfredo asked happily:
34	Alfredo era feliz antes de preguntar	←	Alfredo was happy before asking,
35	Alfredo se alegró, antes de preguntar,	←	Alfredo was glad, before asking,
36	Alfredo era feliz antes de preguntar.	←	Alfredo was happy before asking.
37	Alfredo estaba feliz primero y luego preguntó:	→	Alfredo was happy first and then asked:
38	Alfredo estaba feliz y le preguntó entonces:	←	Alfredo was happy and then asked:
Final Translation: Alfredo was happy and then asked:			

Table A.4: Translation Data Collected with MonoTrans Widgets, sentence 3 on page 5.

#	**Spanish (source)**		**English (target)**
Original	Y para qué quiere el ratón mi diente?		
	Y para qué quiere el ratón mi diente?	→	And why want my tooth mouse? (machine translation)
1	Y por qué quiero que mis dientes de ratón?	←	And why want my tooth mouse?
2	Y a qué mi ratón diente?	→	And to what does my tooth mouse?
3	ACIN lo que hace el ratón del diente?	→	ATION what does my tooth mouse?
4	Y qué quiere el ratón mi diente?	→	And what the mouse wants my tooth?
5	Y lo que el ratón necesita mi diente?	→	And what the mouse needs my tooth?
6	Y qué quiere el ratón es mi diente?	←	And what the mouse wants is my tooth?
7	Y qué quiere el ratón es mi diente?	←	And what, the mouse wants is my tooth?
8	Y por qué quiero que mi ratón dientes?	←	And why do I want my tooth mouse?
9	Y por qué quiero que mi diente, el ratón?	←	And why do I want my tooth, mouse?

10	Y qué quiere el ratón ... es mi diente?	←	And what the mouse wants... is my tooth?
11	Y qué quiere el ratón es mi diente?	←	And what the mouse wants is my tooth?
12	Y qué quiere el ratón mi diente?	←	And what, the mouse wants my tooth?
13	Y qué? El ratón quiere mi diente?	←	And what? The mouse wants my tooth?
14	Y qué hace el ratón quiera con mi diente?	←	And what does the mouse wants with my tooth?
15	Y si el ratón que quiere es mi diente?	←	And what if the mouse wants is my tooth?
16	El ratón quiere mi diente?	←	The mouse wants my tooth?
17	El ratón que quiere es mi diente	←	The mouse wants is my tooth
18	Y qué quiere el ratón mi diente!	←	And what, the mouse wants my tooth!
19	Y qué quiere el ratón es mi diente?	←	'And what the mouse wants is my tooth?'
20	Por qué un ratón que mi diente?	←	Why would a mouse want my tooth?
21	Lo que quiere es que el ratón mi diente?	←	what the mouse wants is my tooth?'
22	Lo que el ratón que quiere es mi diente?, Preguntó.	←	What the the mouse wants is my tooth? he asked.
23	Y qué quiere el ratón mi diente?	←	And what, the mouse wants my tooth?
24	Qué hace el ratón que mi diente por?	←	What does the mouse want my tooth for?
25	Lo que el ratón que quiere es mi diente?	←	What the mouse wants is my tooth?
26	Y si el ratón quiere mi diente?	←	And what if the mouse wants my tooth?
27	Qué hace el ratón quiera con mi diente?	←	What does the mouse want with my tooth?
28	Fear Street-doble Fecha-2	←	Fear Street- Double Date-2
29	El ratón quiere mi diente?	←	The mouse wants my tooth?
30	Y qué es el ratón quiere mi diente?	←	And what is the mouse wants my tooth?
31	Y el ratón quiere mi diente?	←	And the mouse wants my tooth?
32	Y qué - el ratón quiere mi diente?	←	And what - the mouse wants my tooth?
33	Por qué quiere el ratón mi diente?	←	Why does the mouse wants my tooth?

34	Por qué el ratón que mi diente?	←	Why does the mouse want my tooth?
35	Y qué quiere el ratón mi diente?	←	And what, the mouse wants my tooth?
36	Y qué quiere el ratón en mi diente?	←	And what the mouse wants in my tooth?
37	Por qué el ratón que mi diente?	←	why does the mouse want my tooth?
38	Y si el ratón quiere mi diente?	←	And what if the mouse wants my tooth?
39	Y qué quiere el ratón es mi diente?	←	And what the mouse wants is my tooth?
40	Por qué el ratón que mi diente?	←	Why does the mouse want my tooth?
41	El ratón que mi diente?	←	Does the mouse want my tooth?
42	Y lo que el ratón que quiere es mi diente?	←	And what the mouse really wants is my tooth?
43	Y qué es el ratón que mi diente por?	←	And what does the mouse want my tooth for?
44	Y qué es el ratón que quiere es mi diente?	←	And what does the mouse wants is my tooth?
45	Y qué? El ratón que mi diente?	←	And what? Does the mouse want my tooth?
46	Y qué quiere el ratón en mi diente?	←	And what the mouse wants iN my tooth?
47	Qué quiere el ratón mi diente?	←	What, the mouse wants my tooth?
48	Qué quiere el ratón mi diente?	←	What, the mouse wants my tooth?
49	Y cuál es la dosis del ratón que quiere es mi diente?	←	And what dose the mouse wants is my tooth?
50	Y qué quiere el ratón es mi diente? Derecho	←	And what the mouse wants is my tooth? right
51	El ratón quiere mi diente?	←	The mouse wants my tooth?
52	Qué? El ratón que mi diente?	←	What? Does the mouse want my tooth?
53	Yo Keria porche	→	I Keria porch
54	Por qué el ratón que mi diente?	←	Why does mouse want my tooth?
55	Yo porche Keria	←	I porch Keria
56	Yo Keria porche.	←	I porch Keria.
57	Por qué quiere el ratón mi diente?	←	Why does Mouse want my tooth?
58	Por qué el ratón que mi diente?	→	Why did the mouse want my tooth?

Final Translation: Why does mouse want my tooth?

Table A.5: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 6.

#	**Spanish (source)**		**English (target)**
Original	Como el asunto era de extrema importancia, Alfredo decidió investigar preguntando a otros nios.		
	Como el asunto era de extrema importancia, Alfredo decidió investigar preguntando a otros nios.	→	As the matter was of extreme importance, Alfredo decided to investigate by asking other children. (machine translation)
1	Como el asunto era de extrema importancia, Alfredo decidió investigar preguntando a otros nios.	←	As the matter was of extreme importance, Alfredo decided to investigate by asking other children.
2	Al trarse un tema muy importante. Alfredo decidió investigar preguntando a otros nios.	→	Al trarse a very important issue. Alfredo decided to investigate by asking other children.
3	Debido a que el asunto era de extrema importancia, Alfredo decidió investigar preguntando a otros nios.	←	Because the matter was of extreme importance, Alfredo decided to investigate by asking other children.
4	Alfredo decidió pedir a otros nios lo que pensaban acerca de esto.	←	Alfredo decided to ask other children what they thought about this.
5	Alfredo decidió pedir a otros nios lo que pensaban sobre su teoría acerca de los ratones.	←	Alfredo decided to ask other children what they thought about his theory about the mice.
6	Debido a que el asunto era de suma importancia, Alfredo decidió investigar preguntando a otros nios.	←	Because the matter was of extreme importance, Alfredo decided to investigate by asking other children.
7	Debido a que el asunto fue un importante extremo, Alfredo decidió investigar preguntando a otros nios.	←	Because the matter was an extreme important, Alfredo decided to investigate by asking other children.
8	Debido a que el asunto era de extrema importancia Alfredo decidió investigar preguntando a otros nios.	←	Because the matter was of extreme importance Alfredo decided to investigate by asking other children.

9	Debido a que el asunto era muy importante, Alfredo decidió investigar preguntando a otros nios.	←	Because the matter was really important, Alfredo decided to investigate by asking other children.
10	El asunto era de suma importancia, por lo que Alfredo decidió investigar preguntando a otros nios.	←	The matter was of extreme importance, so Alfredo decided to investigate by asking other children.
11	Debido a que el asunto era de extrema importancia Alfredo decidió investigar preguntando a otros nios.	←	Because the matter was of extreme importance Alfredo decided to investigate it by asking other children.
12	Esta pregunta era muy importante para él, por lo que Alfredo decidió investigar preguntando a otros nios.	←	This question was really important to him, so Alfredo decided to investigate by asking other children.
13	Dado que el asunto era de extrema importancia, Alfredo decidió investigar preguntando a otros nios.	←	Since the matter was of extreme importance, Alfredo decided to investigate by asking other children.
14	Debido a que el asunto era extrema importancia, Alfredo decidió investigar preguntando a otros nios.	←	Because of the matter was extreme importance, Alfredo decided to investigate by asking other children.
15	Debido a que el asunto era de extrema importancia Alfredo decidió investigar preguntando children.He otro en el fracaso y la decepción profunda.	←	Because the matter was of extreme importance Alfredo decided to investigate by asking other children.He was in deep failure and disappointment .
16	El asunto era de suma importancia, por lo que, Alfredo decidió investigar. Pidió a los otros nios,	←	The matter was of extreme importance, so, Alfredo decided to investigate. He asked the other children,
17	Debido a que el asunto era de gran importancia, Alfredo decidió investigar preguntando a otros nios.	←	Because the matter was of great significance, Alfredo decided to investigate by asking other children.
18	Debido a que el asunto era de extrema importancia Alfredo decidió investigar preguntando a otros nios. En la lectura	←	Because the matter was of extreme importance Alfredo decided to investigate by asking other children. in reading

19	Debido a que el asunto era de extrema importancia Alfredo decidió investigar preguntando children.abut otras	←	Because the matter was of extreme importance Alfredo decided to investigate by asking other children.abut it
Final Translation: Because the matter was of extreme importance, Alfredo decided to investigate by asking other children.			

Table A.6: Translation Data Collected with MonoTrans Widgets, sentence 1 on page 6.

#	**Spanish (source)**		**English (target)**
Original	Federico sospecha que el ratón es un científico que tiene la fórmula para fabricar dinero y el ingrediente secreto es ... un diente.		
	Federico sospecha que el ratón es un científico que tiene la fórmula para fabricar dinero y el ingrediente secreto es ... un diente.	→	Federico suspected that the mouse is a scientist who has the formula for making money and the secret ingredient is ... a tooth. (machine translation)
1	Federico sospecha de que el ratón es un científico que tiene la fórmula para hacer dinero y es el ingrediente secreto ... un diente.	←	Federico suspected that the mouse is a scientist who has the formula for making money and the secret ingredient is ... a tooth.
2	Federico sospecha de que el ratón era un científico, que tenía la fórmula para hacer dinero, y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who had the formula for making money, and the secret ingredient was... a tooth.
3	Federico sospecha de que el ratón es un científico, que tiene la fórmula para hacer dinero, y el ingrediente secreto es ... UN DIENTE	←	Federico suspected that the mouse is a scientist, who has the formula for making money, and the secret ingredient is ... A TOOTH
4	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who had a formula for making money and the secret ingredient was ... a tooth.

5	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money and that the secret ingredient is ... a tooth.
6	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was scientist who has a formula for making money, and the secret ingredient is ... a tooth.
7	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist with a formula for making money; and the secret ingredient is ... a tooth.
8	Federico sospecho Que El Ratón era sin cientifico Con la fórmula párrafo HACER Dinero y Que El ingrediente secreto era ... Un diente.	←	Federico sospecho que el raton era un cientifico con la formula para hacer dinero y que el ingrediente secreto era ... Un diente.
9	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who has a formula for making money and that the secret ingredient was ... a tooth.
10	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero y es el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who has a formula for making money and the secret ingredient is ... a tooth.
11	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist who had a formula for making money and the secret ingredient is ... a tooth.
12	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was scientist who has a formula for making money and the secret ingredient is ... a tooth.

13	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money and that the secret ingredient was ... a tooth.
14	Federico sospecha de que el ratón era el científico, que tiene una fórmula para hacer dinero y es el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was scientist, who has a formula for making money and the secret ingredient is ... a tooth.
15	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero, y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist with a formula for making money, and that the secret ingredient was ... a tooth.
16	Federico sospecha el ratón era un científico, con una fórmula de hacer dinero, que es el ingrediente principal es ... un diente.	←	Federico suspected the mouse was a scientist, with a money making formula, that's main ingredient is ... a tooth.
17	Federico sospecha de que el ratón era un científico, que tiene la fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist, who has the formula for making money, and the secret ingredient is ... a tooth.
18	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was scientist who had a formula for making money and the secret ingredient was ... a tooth.
19	Federico sospecha de que el ratón es un científico, que tiene la fórmula para hacer dinero, y es el ingrediente secreto ... un diente.	←	Federico suspected that the mouse is a scientist, who has the formula for making money, and the secret ingredient is ... a tooth.
20	Federico sospecha de que el ratón es un científico, que tiene una fórmula para hacer dinero, y es el ingrediente secreto ... un diente.	←	Federico suspected that the mouse is a scientist, who has a formula for making money, and the secret ingredient is ... a tooth.

21	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero, y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money, and that the secret ingredient was... a tooth.
22	Federico sospecha de que el ratón es un científico que tiene la fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse is a scientist who has the formula for making money, and the secret ingredient is ... a tooth.
23	Federico sospecha que el ratón es un científico, que tiene la fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspects the mouse is a scientist, who has the formula for making money, and the secret ingredient is ... a tooth.
24	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero. Y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist who has a formula for making money. And the secret ingredient is ... a tooth.
25	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero y era su ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist with a formula for making money and its secret ingredient was ... a tooth.
26	Federico sospecha de que el ratón es un científico, con una fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse is a scientist, with a formula for making money, and the secret ingredient is ... a tooth.
27	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto fue un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money and that the secret ingredient was a tooth.
28	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero y era el ingrediente secreto ... los dientes.	←	Federico suspected that the mouse was scientist who had a formula for making money and the secret ingredient was ... teeth.
29	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist with a formula for making money and the secret ingredient is ... a tooth.

30	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist who has a formula for making money, and the secret ingredient is ... a tooth.
31	Federico sospecha de que el ratón era un científico, que tiene una fórmula para hacer dinero y es el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who has a formula for making money and the secret ingredient is ... a tooth.
32	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money and that the secret ingredient is ... a tooth.
33	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero, y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money, and that the secret ingredient was ... a tooth.
34	Federico sospecha de que el ratón era un científico con la receta para hacer dinero y que el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist with the recipe for making money and that the secret ingredient is ... a tooth.
35	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero. El ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist with a formula for making money. The secret ingredient was ... a tooth.
36	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero y el ingrediente secreto es ... un diente!	←	Federico suspected that the mouse was scientist who has a formula for making money and the secret ingredient is ... a tooth!
37	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto es los dientes.	←	Federico suspected that the mouse was a scientist with the formula for making money and that the secret ingredient is teeth.

38	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero y que el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist with a formula for making money and that the secret ingredient is ... a tooth.
39	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto de la fórmula es ... un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money and that the formula's secret ingredient is ... a tooth.
40	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero. El ingrediente secreto es un diente.	←	Federico suspected that the mouse was scientist who had a formula for making money. The secret ingredient is a tooth.
41	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero, y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was scientist with a formula for making money and the secret ingredient was ... a tooth.
42	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero y el ingrediente secreto ... los dientes.	←	Federico suspected that the mouse was scientist who has a formula for making money and the secret ingredient is ... teeth.
43	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist with a formula for making money and that the secret ingredient was ... a tooth.
44	Alfredo sospecha que el ratón era un científico que había descubierto una fórmula para hacer dinero, el ingrediente secreto ... un diente!	←	Alfredo suspected that the mouse was a scientist who had discovered a formula for making money, the secret ingredient ... a tooth!
45	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto es ... dentición.	←	Federico suspected that the mouse was a scientist with the formula for making money and that the secret ingredient is ... teethe.
46	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was scientist who has a formula for making money and the secret ingredient ... a tooth.

47	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero, y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was scientist with a formula for making money, and the secret ingredient was ... a tooth.
48	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero, y el ingrediente secreto es un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money, and the secret ingredient is a tooth.
49	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer moneya y es el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who has a formula for making moneya and the secret ingredient is ... a tooth.
50	Federico sospecha de que el ratón era un científico, que tiene una fórmula para hacer dinero, y el ingrediente secreto es un diente.	←	Federico suspected that the mouse was scientist, who has a formula for making money, and the secret ingredient is a tooth.
51	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero, y que el ingrediente secreto es un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money, and that the secret ingredient is a tooth.
52	Federico sospecha el ratón fue el científico que tiene una fórmula para hacer dinero y es el ingrediente secreto ... un diente.	←	Federico suspected the mouse was the scientist who has a formula for making money and the secret ingredient is ... a tooth.
53	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero, y el ingrediente secreto es un diente.	←	Federico suspected that the mouse was a scientist who has a formula for making money, and the secret ingredient is a tooth.
54	Federico sospecha de que el científico del ratón tenía la fórmula para hacer dinero y el ingrediente secreto ... un diente.	←	Federico suspected the mouse scientist had the formula for making money and the secret ingredient was ... a tooth.
55	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero, y el ingrediente secreto fue un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money, and the secret ingredient was a tooth.
56	Federico sospecha de que el ratón era un científico, un ratón que había una fórmula para hacer dinero cuyo ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was scientist; a mouse who had a formula for making money whose secret ingredient was ... a tooth.

57	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero. El ingrediente secreto es un diente.	←	Federico suspected that the mouse was a scientist with the formula for making money. The secret ingredient is a tooth.
58	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto ... los dientes.	←	Federico suspected that the mouse was a scientist with the formula for making money and that the secret ingredient was ... teeth.
59	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero y que el ingrediente secreto es un diente.	←	Federico suspected that the mouse was a scientist that had a formula for making money and that the secret ingredient is a tooth.
60	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero con el ingrediente secreto de un ... un diente.	←	Federico suspected that the mouse was a scientist who has a formula for making money with the secret ingredient of a ... a tooth.
61	Federico sospecha de que el ratón era un científico que sabía que el ingrediente secreto (un diente) en la fórmula para hacer dinero	←	Federico suspected that the mouse was a scientist who knew the secret ingredient (a tooth)in the formula for making money
62	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero, y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who had a formula for making money, and the secret ingredient was ... a tooth.
63	Federico sospecha que el ratón es un científico con una fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspects that the mouse is a scientist with a formula for making money; and the secret ingredient is ... a tooth.
64	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto ... un diente!	←	Federico suspected that the mouse was a scientist with the formula for making money and that the secret ingredient was ... a tooth!
65	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero y el ingrediente secreto es un diente.	←	Federico suspected that the mouse was a scientist who has a formula for making money and the secret ingredient is a tooth.

66	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero, con el que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who had a formula for making money, with the secret ingredient being... a tooth.
67	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero y que el ingrediente secreto ... un diente!	←	Federico suspected that the mouse was a scientist with a formula for making money and that the secret ingredient was ... a tooth!
68	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist with a formula for making money, and the secret ingredient is ... a tooth.
69	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero y es el ingrediente secreto ... los dientes!	←	Federico suspected that the mouse was a scientist who had a formula for making money and the secret ingredient is ... teeth!
70	Federico sospecha de que el ratón era un científico que había una fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who had a formula for making money and the secret ingredient was... a tooth.
71	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero y es el ingrediente secreto, un diente	←	Federico suspected that the mouse was scientist who has a formula for making money and the secret ingredient is, a tooth
72	Federico sospecha de que el ratón era un científico que tiene una fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist who has a formula for making money, and the secret ingredient is... a tooth.
73	Federico sospecha que el ratón es un científico con una fórmula para hacer dinero y su ingrediente secreto es ... un diente.	←	Federico suspects that the mouse is a scientist with a formula for making money and its secret ingredient is ... a tooth.
74	Federico sospecha el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto es ... un diente.	→	Federico suspected the mouse was a scientist with the formula for making money and that the secret ingredient is ... a tooth.

75	Francisco sospechaba que el ratón era un científico con la fórmula para hacer dinero y que el ingrediente secreto es ... un diente.	→	Francis suspected the mouse was a scientist with the formula for making money and that the secret ingredient is ... a tooth.
76	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist using the formula for making money and the secret ingredient is ... a tooth.
77	Federico sospecha de que el ratón era un científico, que utiliza la fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who used the formula for making money and the secret ingredient was ... a tooth.
78	Ciudad de conejo está de visita en el país. l se encuentra con otro animal y piensa que es un conejo. El conejo país dice: Eso no es un conejo	←	City rabbit is visiting the country. He comes across another animal and thinks it's a rabbit. The country rabbit says That's not a rabbit
79	Federico sospecha de que el ratón era un científico con la fórmula para llevar a cabo un experimento para hacer dinero y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist using the formula to conduct an experiment to make money and the secret ingredient is ... a tooth.
80	Federico sospecha de que el ratón era un científico, que utiliza la fórmula para hacer dinero y era el ingrediente secreto ... un dulce tooth.or	←	Federico suspected that the mouse was a scientist, who used the formula for making money and the secret ingredient was ... a tooth.or candy
81	Federico sospecha de que el ratón era un científico que utiliza la fórmula para hacer dinero, y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who used the formula for making money, and the secret ingredient was ... a tooth.
82	Federico sospecha de que el ratón era un científico que utiliza la fórmula para hacer dinero, y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who used the formula for making money; and the secret ingredient was ... a tooth.

83	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero. Ingrediente secreto de la fórmula fue un diente!	←	Federico suspected that the mouse was a scientist using a formula for making money. The formula's secret ingredient was a tooth!
84	Federico sospecha de que el ratón era un científico, que utiliza la fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who used the formula for making money and the secret ingredient was ... a tooth.
85	Federico sospecha de que el ratón era un científico que utiliza la fórmula para hacer dinero. El ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist who used the formula for making money. The secret ingredient is ... a tooth.
86	Federico sospecha de que el ratón era un científico que utiliza la fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who used the formula for making money and the secret ingredient was ... a tooth.
87	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist using a formula for making money and the secret ingredient is ... a tooth.
88	Federico sospecha de que el ratón era un científico utilizando la fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist using the formula for making money and the secret ingredient was ... a tooth.
89	Federico sospecha de que el ratón era un científico, que utiliza la fórmula para hacer dinero, y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who used the formula for making money, and the secret ingredient was ... a tooth.
90	Federico sospecha de que el ratón era un científico que utiliza la fórmula para hacer dinero y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who used the formula for making money and that the secret ingredient was ... a tooth.

91	Federico sospecha que el ratón es un científico que tiene un dinero que hace la fórmula que utiliza los dientes como el ingrediente secreto.	←	Federico suspects that the mouse is a scientist who has a money making formula that uses teeth as the secret ingredient.
92	Federico sospecha de que el ratón era un científico, que utiliza la fórmula para hacer dinero. Y, el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who used the formula for making money. And, the secret ingredient was ... a tooth.
93	Federico sospecha de que el ratón era un científico, que utiliza una fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who used a formula for making money and the secret ingredient was ... a tooth.
94	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist using a formula for making money, and the secret ingredient is ... a tooth.
95	Federico sospecha de que el ratón era un científico utilizando la fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist using the formula for making money and the secret ingredient was ... a tooth.
96	Federico sospecha de que el ratón era un científico que utiliza la fórmula para hacer dinero. Y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who used the formula for making money. And the secret ingredient was ... a tooth.
97	Federico sospecha de que el ratón era un científico con una fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist using a formula for making money and the secret ingredient was ... a tooth.
98	Federico sospecha de que el ratón era un científico que utiliza la fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who used the formula for making money and the secret ingredient was ... a tooth.

99	Federico sospecha de que el ratón era un científico, que estaba usando la fórmula para hacer dinero. Y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who was using the formula to make money. And the secret ingredient was ... a tooth.
100	Federico sospecha de que el ratón era un científico que estaba usando la fórmula para hacer dinero. Y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who was using the formula to make money. And the secret ingredient was ... a tooth.
101	Federico sospecha el ratón era un científico utilizando la fórmula para hacer dinero y que el ingrediente secreto fue un diente.	←	Federico suspected the mouse was a scientist using the formula for making money and that the secret ingredient was a tooth.
102	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist using the formula for making money; and the secret ingredient is ... a tooth.
103	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero, y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist using the formula for making money, and that the secret ingredient was ... a tooth.
104	Federico sospecha de que el ratón era un científico, que utiliza la fórmula para hacer dinero, y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who used the formula for making money, and that the secret ingredient was ... a tooth.
105	Federico sospecha de que el ratón era un científico, que utiliza el ingrediente secreto de un diente en una fórmula para hacer dinero.	←	Federico suspected that the mouse was a scientist, who used the secret ingredient of a tooth in a formula for making money.
106	Federico sospecha de que el ratón era un científico, que utiliza una fórmula para hacer dinero y era el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who used a formula for making money and the secret ingredient was ... a tooth.
107	Federico sospecha de que el ratón era un científico con la fórmula para hacer dinero. Y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist using the formula for making money. And the secret ingredient was ... a tooth.

108	Federico sospecha de que el ratón era un científico que utiliza la fórmula para hacer dinero, y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist who used the formula for making money, and the secret ingredient was... a tooth.
109	Federico sospecha de que el ratón era un científico, utilizando la fórmula para hacer dinero, y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist, using the formula for making money, and the secret ingredient is ... a tooth.
110	Federico sospecha de que el ratón era un científico utilizando la fórmula para hacer dinero y que el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist using the formula for making money and that the secret ingredient was ... a tooth.
111	Federico sospecha de que el ratón era un científico utilizando la fórmula de dinero, el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist using the formula to money; the secret ingredient ... a tooth.
112	Federico sospecha de que el ratón era un científico, que utiliza la fórmula para hacer dinero, y el ingrediente secreto ... un diente.	←	Federico suspected that the mouse was a scientist, who used the formula for making money, and the secret ingredient was ... a tooth.
113	Federico sospecha de que el ratón era un científico, utilizando la fórmula para hacer dinero. Y el ingrediente secreto es ... un diente.	←	Federico suspected that the mouse was a scientist, using the formula for making money. And the secret ingredient is ... a tooth.
Final Translation: Federico suspected that the mouse was a scientist using the formula for making money and the secret ingredient is ... a tooth.			

Table A.7: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 8.

#	**Spanish (source)**		**English (target)**
Original	Victoria Elena piensa que el ratón quiere los dientes porque está construyendo una larga escalera para llegar a la luna que está hecha de queso.		

	Victoria Elena piensa que el ratón quiere los dientes porque está construyendo una larga escalera para llegar a la luna que está hecha de queso.	→	Victoria Elena thinks that the mouse wants to teeth because it is building a long ladder to reach the moon is made of cheese. (machine translation)
1	Elena Victoria piensa que el ratón quiere los dientes, ya que es la construcción de una escalera muy larga para llegar a la luna está hecha de queso.	←	Victoria Elena thinks that the mouse wants to teeth because it is building a long ladder to reach the moon is made of cheese.
2	Victoria yajaira que los dientes del ratón, ya que son la construcción de una escalera muy larga para llegar a la luna está hecha de queso.	→	Victoria yajaira think the mouse teeth because you are building a long ladder to reach the moon is made of cheese.
3	Elena Victoria piensa que el ratón de los dientes, porque quiere que se está construyendo una escalera muy larga para llegar a la luna está hecha de queso.	←	Victoria Elena thinks that the mouse wants the teeth because it is building a long ladder to reach the moon is made of cheese.
4	Elena Victoria piensa que el ratón quiere los dientes, ya que es la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants teeth because it is building a long ladder to reach the moon, which is made of cheese.
5	Elena Victoria piensa que el ratón quiere los dientes, ya que es la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants the teeth because it is building a long ladder to reach the moon, which is made of cheese.
6	Elena Victoria piensa que el ratón de los dientes, porque quiere que se está construyendo una escalera muy larga para llegar a la luna que está hecha de queso.	←	Victoria Elena thinks that the mouse wants the teeth because it is building a long ladder to reach the moon wich is made of cheese.
7	Elena Victoria piensa que el ratón de los dientes quiere construir una escalera muy larga para llegar a la luna, que él piensa que está hecha de queso.	←	Victoria Elena thinks the mouse wants the teeth to build a long ladder to reach the moon, which he thinks is made of cheese.

8	Elena Victoria piensa que el ratón de los dientes, porque quiere que se está construyendo una escalera muy larga para llegar a la luna que está hecha de queso.	←	Victoria Elena thinks that the mouse wants the teeth because it is building a long ladder to reach the moon that is made of cheese.
9	Elena Victoria piensa que el ratón de los dientes, porque quiere que se está construyendo una escalera muy larga para llegar a la luna. Se está hecha de queso.	←	Victoria Elena thinks that the mouse wants the teeth because it is building a long ladder to reach the moon. It is made of cheese.
10	Elena Victoria piensa que el ratón quiere los dientes, ya que es la construcción de una larga escalera a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants teeth because it is building a long ladder to the moon, which is made of cheese.
11	Victoria Elena piensa que el ratón quiere los dientes, ya que es la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants teeth because it is building a long ladder to reach the moon, which is made of cheese.
12	Victoria Elena pensó que el ratón quería tener los dientes, ya que quiere construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thought that the mouse wanted teeth as it wants to build a long ladder to reach the moon, which is made of cheese.
13	Elena Victoria piensa que el ratón quiere los dientes porque es la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants teeth because he is building a long ladder to reach the moon, which is made of cheese.
14	Elena Victoria piensa que el ratón quiere los dientes por lo que puede convertirse en un toothfairy.	←	Victoria Elena thinks that the mouse wants teeth so it can turn into a toothfairy.
15	Elena Victoria piensa que el ratón de los dientes quiere construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants the teeth to build a long ladder to reach the moon, which is made of cheese.
16	Elena Victoria piensa que el ratón de los dientes quiere porque él es la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants the teeth because he is building a long ladder to reach the moon, which is made of cheese.
17	Cadejos	←	cadejos

18	Victoria Elena pensó que quería el ratón de los dientes, ya que fue la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thought that the mouse wanted the teeth because it was building a long ladder to reach the moon, which is made of cheese.
19	Victoria Elena cree que el ratón quiere dientes para construir una escalera larga y llegar a la luna, que está hecha de queso.	←	Victoria Elena believes the mouse wants teeth to build a long ladder reaching the moon, which is made of cheese.
20	Victoria Elena cree que el ratón quiere el diente, ya que es la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the tooth because it is building a long ladder to reach the moon, which is made of cheese.
21	Victoria Elena piensa que el ratón quería que los dientes de los nios sólo porque querían construir una escalera larga que puede llegar a alcanzar la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wanted the children teeth just because they wanted to build a long ladder that can reach to reach the moon, which is made of cheese.
22	Victoria Elena piensa que el ratón quiere los dientes, ya que es la construcción de una escalera de altura para llegar a la Luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants the teeth because it is building a tall ladder to reach the moon, which is made of cheese.
23	Victoria Elena cree que el ratón quiere los dientes porque es la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the teeth because he is building a long ladder to reach the moon, which is made of cheese.
24	Victoria Elena cree que el ratón necesita los dientes, ya que es la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse needs teeth because it is building a long ladder to reach the moon, which is made of cheese.
25	Victoria Elena piensa que el ratón de los dientes necesita para construir una escalera a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse needs the teeth to build ladder to the moon, which is made of cheese.

26	Victoria Elena cree que el ratón quiere los dientes, que se dedica a la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	→	Victoria Elena thinks the mouse wants the teeth, which is dedicated to building a long ladder to reach the moon, which is made of cheese.
27	Victoria Elena cree que el ratón quiere los dientes a la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the teeth to building a long ladder to reach the moon, which is made of cheese.
28	Victoria Elena cree que el ratón de los dientes quiere construir una escalera muy larga para llegar a la luna que está hecha de queso.	←	Victoria Elena thinks the mouse wants the teeth to build a long ladder to reach the moon which is made of cheese.
29	Victoria Elena piensa que el ratón de los dientes necesita para construir una escalera larga y llegar a la Luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse needs the teeth in order to build a long ladder and reach the moon, which is made of cheese.
30	Victoria Elena cree que el ratón de los dientes que quiere construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the teeth to build a long ladder to reach the moon, which is made of cheese.
31	Victoria Elena cree que el ratón quiere el secreto para construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the secret to building a long ladder to reach the moon, which is made of cheese.
32	Victoria Elena cree que el ratón de los dientes quiere construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the teeth to build a long ladder to reach the moon, which is made of cheese.
33	Victoria Elena cree que el ratón quiere los dientes a la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso. OMG, dijo Samuel	←	Victoria Elena thinks the mouse wants the teeth to building a long ladder to reach the moon, which is made of cheese. OMG said samuel
34	Victoria Elena sospecha que el ratón planes para construir una escalera larga de los dientes para llegar a la luna, que está hecha de queso.	←	Victoria Elena suspects that the mouse plans to build a long ladder of teeth to reach the moon, which is made of cheese.

35	Victoria Elena cree que el ratón quiere construir una escalera larga que llega a la luna con sus dientes, que está hecha de queso.	←	Victoria Elena thinks the mouse wants to build a long ladder that reaches the moon with his teeth, which is made of cheese.
36	Victoria Elena cree que el ratón usa sus dientes para construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse uses its teeth to build a long ladder to reach the moon, which is made of cheese.
37	Victoria Elena cree que el ratón quiere el diente para construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the tooth to build a long ladder to reach the moon, which is made of cheese.
38	Victoria Elena cree que el ratón de los dientes quiere construir una escalera muy larga para llegar a la luna, que está hecha de queso cheddar.	←	Victoria Elena thinks the mouse wants the teeth to build a long ladder to reach the moon, which is made of cheddar cheese.
39	Victoria Elena piensa que el ratón quiere dientes para la construcción de una escalera muy larga para llegar a la luna que está hecha de queso.	←	Victoria Elena thinks that the mouse wants teeth for building a long ladder to reach the moon which is made of cheese.
40	Victoria Elena cree que el ratón de los dientes que quiere construir una escalera muy larga para llegar a la luna, que está hecha de queso. Qué extraa idea, dijo Jordan.	←	Victoria Elena thinks the mouse wants the teeth to build a long ladder to reach the moon, which is made of cheese. What a strange idea said Jordan.
41	Victoria Elena cree que el ratón de los dientes que quiere construir una escalera muy larga para llegar a la luna, que está hecha de queso. El ratón le encantaría una escalera hecha de queso	←	Victoria Elena thinks the mouse wants the teeth to build a long ladder to reach the moon, which is made of cheese.The mouse would love a ladder made of cheese
42	Victoria Elena cree que el ratón quiere los dientes a la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso. Eso es estúpido, Mouses se puede tomar un cohete, dijo Samuel	←	Victoria Elena thinks the mouse wants the teeth to building a long ladder to reach the moon, which is made of cheese. Thats stupid, Mouses can just take a rocket said samuel

43	Victoria Elena cree que el ratón quiere dientes para construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants teeth to build a long ladder to reach the moon, which is made of cheese.
44	Victoria Elena cree que el ratón de los dientes a las necesidades de construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse needs the teeth to build a long ladder to reach the moon, which is made of cheese.
45	Victoria Elena cree que el ratón quiere las instrucciones para la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the directions to building a long ladder to reach the moon, which is made of cheese.
46	Victoria Elena cree que el ratón de los dientes quiere para la construcción de una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the teeth for building a long ladder to reach the moon, which is made of cheese.
47	Victoria Elena piensa que el ratón quiere el diente para construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants the tooth to build a long ladder to reach the moon, which is made of cheese.
48	Victoria Elena cree que el ratón quiere que los recursos para construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the resources to build a long ladder to reach the moon, which is made of cheese.
49	Victoria Elena cree que el ratón quiere los dientes con el fin de construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wants the teeth in order to build a long ladder to reach the moon, which is made of cheese.
50	Victoria Elena cree que el ratón quiere los dientes a la construcción de una escalera muy larga para llegar a la luna que está hecha de queso.	←	Victoria Elena thinks the mouse wants the teeth to building a long ladder to reach the moon which is made of cheese.
51	Victoria Elena pensó que el ratón de los dientes que quería construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thought the mouse wanted the teeth to build a long ladder to reach the moon, which is made of cheese.

52	Victoria Elena piensa que el ratón de los dientes que quiere construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks that the mouse wants the teeth to build a long ladder to reach the moon, which is made of cheese.
53	Victoria Elena cree que el ratón de los dientes que quería construir una escalera muy larga para llegar a la luna, que está hecha de queso.	←	Victoria Elena thinks the mouse wanted the teeth to build a long ladder to reach the moon, which is made of cheese.
Final Translation: Victoria Elena thinks the mouse wants the teeth to build a long ladder to reach the moon, which is made of cheese.			

Table A.8: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 11.

#	**Spanish (source)**		**English (target)**
Original	Martín cree que el ratón usa los dientes como ladrillos para hacer más grande su casa, pues con tantos primos y parientes, ya no alcanzan.'		
	Martín cree que el ratón usa los dientes como ladrillos para hacer más grande su casa, pues con tantos primos y parientes, ya no alcanzan.'	→	Martin believes that the mouse uses the teeth as bricks for the bigger your house, as with so many cousins and relatives, and not enough. (machine translation)
1	Martin cree que el ratón de los dientes utiliza como ladrillos para la casa más grande, como sucede con tantos primos y parientes, y no lo suficiente.	←	Martin believes that the mouse uses the teeth as bricks for the bigger your house, as with so many cousins and relatives, and not enough.
2	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande. Tiene que muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house. It has so many cousins and relatives and not enough room.
3	Martin cree que el ratón utiliza sus dientes como los ladrillos para hacer su casa más grande. Con tantos primos y familiares, su casa no es lo suficientemente grande.	←	Martin believes that the mouse uses their teeth as bricks to make his house bigger. With so many cousins and relatives, his house is not big enough.

4	Martin cree que el ratón está usando los dientes como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no suficiente espacio para todos ellos.	←	Martin believes that the mouse is using the teeth as bricks to build a bigger house, because it has so many cousins and relatives and not enough room for them all.
5	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, como lo ha hecho muchos primos y parientes, y no suficiente espacio para.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, as it has so many cousins and relatives, and not enough room.
6	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, because it has so many cousins and relatives and not enough room.
7	Martin cree que el ratón de los dientes utiliza como ladrillos para hacer su casa más grande. Con tantos primos y familiares, su casa no es lo suficientemente grande.	←	Martin believes that the mouse uses the teeth as bricks to make his house bigger. With so many cousins and relatives, his house is not big enough.
8	Martin cree que el uso del ratón de los dientes, como ladrillos para construir una casa más grande, ya que tiene muchos familiares y su casa actual no tenga suficiente espacio.	←	Martin believes the mouse will use the teeth as bricks to build a bigger house, since he has many relatives and his current house doesnt have enough room.
9	Martin cree que el ratón utiliza los dientes como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses teeth as bricks to build a bigger house, because it has so many cousins and relatives and not enough room.
10	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, como lo ha hecho para muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, as he has so many cousins and relatives, and not enough room.

11	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, porque tiene tan muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, because he has so many cousins and relatives and not enough room.
12	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, ya que ha muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house,since he has so many cousins and relatives, and not enough room.
13	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, because it has so many cousins and relatives, and not enough room.
14	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes y no suficientes habitaciones para que puedan permanecer adentro	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, because it has so many cousins and relatives and not enough rooms for them to stay in.
15	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, ya que ha muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, since it has so many cousins and relatives and not enough room.
16	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, pero no suficiente espacio.	←	Martin believes the mouse uses the teeth as bricks to build a bigger house, because it has so many cousins and relatives but not enough room.
17	Martin cree que el uso del ratón de los dientes, como ladrillos para construir una casa más grande para sus muchos primos y familiares.	←	Martin thinks the mouse will use the teeth as bricks to build a bigger house for his many cousins and relatives.

18	Martin cree que el ratón utiliza los dientes como ladrillos para construir una casa más grande. Tiene muchos primos y familiares y la necesidad de más habitaciones.	←	Martin believes the mouse uses teeth as bricks to build a bigger house. It has too many cousins and relatives and need more rooms.
19	Martin cree que el ratón utiliza los dientes como ladrillos para construir una casa más grande, como lo ha hecho para muchos primos y parientes, y no suficiente espacio.	←	Martin believes the mouse uses the teeth as bricks to build a bigger house, as he has so many cousins and relatives, and not enough room.
20	Martin cree que los ratones que usa sus dientes para comer a su presa.	←	Martin believes that mice uses its teeth to eat its prey.
21	Qué es esta mierda	←	What is this shit
22	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, como lo ha hecho a muchos familiares, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, as it has so many relatives, and not enough room.
23	Martin cree que el ratón, que tiene muchos primos y sala familiar y no lo suficiente, usa los dientes como ladrillos para construir una casa más grande.	←	Martin believes that the mouse, who has many cousins and relative and not enough room, uses the teeth as bricks to build a bigger house.
24	Martin cree que el ratón quiere usar los dientes como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse wants to use the teeth as bricks to build a bigger house, because it has too many cousins and relatives, and not enough room.
25	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, ya que ha muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, since it has so many cousins and relatives, and not enough room.
26	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, como lo ha hecho muchos primos y parientes, y no suficientes habitaciones.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, as it has so many cousins and relatives, and not enough rooms.

27	Martin cree que el ratón utiliza sus dientes como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses his teeth as bricks to build a bigger house, because it has so many cousins and relatives and not enough room.
28	Martin cree que el ratón usa sus dientes para llevar ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses its teeth to carry bricks to build a bigger house, because it has so many cousins and relatives and not enough room.
29	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, porque tiene muchos primos y tías, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, because it has so many cousins and aunties, and not enough room.
30	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, debido a que el ratón tiene tantos primos y parientes, y no suficiente espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house, because the mouse has so many cousins and relatives and not enough room.
31	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande. Debido a que el ratón tiene tantos primos y parientes, y no hay suficiente espacio, que quiere más espacio.	←	Martin believes that the mouse uses the teeth as bricks to build a bigger house. Because the mouse has so many cousins and relatives, and not enough room, it wants more space.
32	Martin cree que el ratón de los dientes utiliza como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no hay espacio suficiente.	→	Martin believes that the mouse uses the teeth as bricks to build a bigger house, because it has many cousins and relatives and not enough space.
33	Martin cree que el ratón está usando los bloques de ladrillos para que pueda hacer su pequea casa lo suficientemente grande como para caber sus muchos primos y familiares.	←	Martin believes that the mouse is using the blocks as bricks so he can make his little house big enough to fit his many cousins and relatives.

34	Martin cree que el ratón utiliza los bloques como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no hay espacio suficiente.	←	Martin believes that the mouse uses the blocks as bricks to build a bigger house, because it has many cousins and relatives and not enough space.
35	Martin cree que el ratón utiliza los bloques como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no el espacio suficiente para ellos para vivir	←	Martin believes that the mouse uses the blocks as bricks to build a bigger house, because he has many cousins and relatives and not enough space for them to live in.
36	el Gigante no le gustaba a los nios	←	the Giant didn't like the children
37	El gigante no le gustaban los nios.	←	The giant didn't like the children.
38	El gigante no le gustaban los nios.	←	The Giant didn't like the children.
39	el gigante no le gustaban los nios	←	the giant didn't like the children
40	Martin cree que el ratón utiliza los bloques como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no hay espacio suficiente. Qué fue de	←	Martin believes that the mouse uses the blocks as bricks to build a bigger house, because it has many cousins and relatives and not enough space. What Ever
41	Martin utiliza el ratón los bloques como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no hay espacio suficiente.	←	Martin the mouse uses the blocks as bricks to build a bigger house, because he has many cousins and relatives and not enough space.
42	Martin cree que el ratón utiliza los bloques como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, pero no hay suficiente espacio.	←	Martin believes that the mouse uses the blocks as bricks to build a bigger house, because he has many cousins and relatives but not enough space.
43	El gigante no le gustaban los nios	←	The giant didn't like the children
44	Martin cree que el ratón utiliza los bloques como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no hay espacio suficiente.	←	Martin believes that the mouse uses the blocks as bricks to build a bigger house, because he has many cousins and relatives and not enough space.

45	Martin cree que el ratón está usando los bloques como ladrillos para construir una casa más grande, porque tiene muchos primos y parientes, y no hay espacio suficiente.	←	Martin believes that the mouse is using the blocks as bricks to build a bigger house, because it has many cousins and relatives and not enough space.
46	el Gigante no le gustaba que el nio	←	the Giant did not like the child
47	Martin cree que el ratón utiliza los bloques como ladrillos para construir una casa más grande porque tiene muchos primos y parientes, y no hay espacio suficiente.	←	Martin believes that the mouse uses the blocks as bricks to build a bigger house because it has many cousins and relatives and not enough space.
48	Martin cree que el ratón utiliza los bloques como ladrillos para construir una casa más grande, porque necesita más espacio para sus primos y parientes manny.	←	Martin believes that the mouse uses the blocks as bricks to build a bigger house, because it need more space for his manny cousins and relatives.
49	Victoria Elena glaubt, dass die die Maus Zaehne moechte weil sie eine lange Leiter baut um zu zum Mond gehen, der Mond, aus der Kaese gemacht ist.	←	Victoria Elena glaubt, dass die Maus die Zaehne moechte weil sie eine lange Leiter baut um zum Mond zu gehen, der Mond, der aus Kaese gemacht ist.
50	El ratón no le gustaban los nios.	←	The mouse didn't like the children.
51	Martin cree que el ratón utiliza los bloques como ladrillos para construir una casa más grande. Tiene muchos primos y parientes, y no hay espacio suficiente.	←	Martin believes that the mouse uses the blocks as bricks to build a bigger house. It has many cousins and relatives and not enough space.
52	El gigante no le gustaban los nios.	←	The giant didn't like children.
Final Translation: the Giant didn't like the children			

Table A.9: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 12.

#	**Spanish (source)**		**English (target)**
Original	Un puente para ir al otro lado del océano y buscar más dientes!		
	Un puente para ir al otro lado del océano y buscar más dientes!	→	A bridge to go across the ocean and look for more teeth! (machine translation)

1	Un puente para cruzar el océano y buscar más los dientes!	←	A bridge to go across the ocean and look for more teeth!
2	Un puente para cruzar el océano y buscar más los dientes!	→	A bridge to cross the ocean and look for more teeth!
3	Buscó un puente para cruzar el océano, así que él podría buscar más los dientes!	←	He searched for a bridge to cross the ocean, so he could look for more teeth!
4	Es un puente para cruzar el océano y buscar más los dientes!	←	It is a bridge to go across the ocean and look for more teeth!
5	Es un puente para cruzar el océano y buscar más los dientes, por lo que puede hacer un puente de más tiempo y viajar por todo el mundo.	←	It is a bridge to go across the ocean and look for more teeth, so he can make an even longer bridge and travel around the world.
6	Buscó un puente para cruzar el océano para poder buscar más los dientes!	←	He searched for a bridge to cross the ocean so he could look for more teeth!
7	Se los utiliza para construir un puente que cruza el océano, así que él puede buscar más los dientes!	←	He uses them to build a bridge crossing the ocean, so he can look for more teeth!
8	Un puente que cruza el océano para encontrar más dientes!	→	A bridge across the ocean to find more teeth!
9	Vamos a hacer un puente sobre el mar, así que podemos encontrar más dientes!	←	Let's make a bridge across the ocean so that we can find more teeth!
10	Vamos a hacer un puente sobre el mar, así que podemos encontrar más dientes!	←	'Let's make a bridge across the ocean so we can find more teeth!'
11	Vamos a hacer un puente sobre el mar, así que podemos encontrar más dientes!	←	Let's make a bridge across the ocean so that we can find more teeth!
12	Vamos a hacer un puente sobre el mar, así que podemos encontrar más dientes!	←	Let's make a bridge across the ocean so that we can find more teeth!
13	Vamos a hacer un puente que cruza el océano para que pueda encontrar más dientes!	←	Let's make a bridge across the ocean so that he can find more teeth!
14	Vamos a hacer un puente sobre el mar, así que podemos encontrar más dientes!	←	Let's make a bridge across the ocean so we can find more teeth!

15	Vamos a construir un puente sobre el mar, así que podemos encontrar más dientes!	←	Let's build a bridge across the ocean so that we can find more teeth!
16	Vamos a hacer un puente sobre el lago para que se vea romántico.	←	Let's make a bridge across the lake to make it look romantic.
17	Vamos a hacer un puente sobre el mar, así que podemos encontrar a más gente a ahorrar! Vamos?	←	Let's make a bridge across the ocean so that we can find more people to save! come on?
18	Vamos a hacer un puente que cruza el océano para ayudarnos a encontrar más dientes!	←	Let's make a bridge across the ocean to help us find more teeth!
19	Vamos a hacer un puente sobre el mar, así que podemos encontrar más dientes!	←	Let's make a bridge across the ocean so we can find more teeth!
20	Vamos a hacer un puente sobre el mar, para que podamos encontrar más dientes!	→	Let's make a bridge over the sea, so we can find more teeth!
21	Vamos a hacer un puente sobre el mar, por lo que pueden encontrar más peces!	←	Let's make a bridge over the sea, so we can find more Fish!
22	Vamos a hacer un puente sobre el mar, por lo que pueden encontrar más peces!	←	Let's make a bridge over the sea, so we can find more fish!
23	Vamos a hacer un puente sobre el mar para que podamos encontrar más peces!	←	Let's make a bridge over the sea so we can find more fish!
24	Vamos a construir un puente sobre el mar, por lo que puede capturar más pescado!	←	Let's build a bridge over the sea, so we can catch more Fish!
25	Vamos a construir un puente sobre el mar, por lo que pueden encontrar más peces!	←	Let's build a bridge over the sea, so we can find more fish!
26	Vamos a construir un puente sobre el agua, por lo que se puede pescar más peces!	←	Let's build a bridge over the water, so we can catch more fish!
27	Vamos a hacer un puente sobre el mar, por lo que podemos encontrar más peces!	←	Let's make a bridge over the sea, so that we can find more fish!
28	Hacen un puente sobre el mar, por lo que pueden encontrar más peces!	←	They make a bridge over the sea, so they can find more fish!

29	Vamos a hacer un puente sobre el mar para que podamos encontrar más peces!	←	Let's make a bridge over the sea so we can find more Fish!
Final Translation: Let's make a bridge over the sea, so we can find more fish!			

Table A.10: Translation Data Collected with MonoTrans Widgets, sentence 1 on page 12.

#	**Spanish (source)**		**English (target)**
Original	- gritó Dora.		
	- gritó Dora.	→	- Cried Dora. (machine translation)
1	- Gritó Dora.	←	- Cried Dora.
2	, Dijo Dora.	←	, said Dora.
3	", Dijo Dora.	←	"Said Dora.
4	Dijo Dora.	←	Said Dora.
5	- Exclamó Dora.	←	- cried Dora.
6	dijo Dora.	←	said Dora.
7	, Dijo Dora, mirando a sus amigos con una cara sorprendida y divertida.	←	Said Dora, looking at her friends with a surprised and funny face.
8	Se buscó un puente para cruzar el océano, así que él podría buscar más los dientes!, Dijo Dora.	←	He searched for a bridge to cross the ocean, so he could look for more teeth! said Dora.
9	El era mas feliz del puebilto Que se Tenga recurdo	←	Era el puebilto mas feliz del que se tenga recurdo
10	, Exclamó Dora.	←	, cried Dora.
11	-exclamó Dora.	←	cried Dora.
12	Dijo Dora.	←	Said Dora.
13	", Dijo Dora."	←	"Said Dora."
14	- Exclamó Dora.	←	- cried Dora.
15	- Exclamó Dora.	←	- cried Dora.
16	autobiografija Branislava nusica	←	autobiografija branislava nusica
17	Dora lloraba.	←	Dora cried.
18	- Exclamó Dora Dora Lloro.	←	- cried Dora. Lloro Dora
19	. - Exclamó Dora: (	←	- cried Dora. :(
20	, Exclamó Dora.	←	cried Dora.
21	Dora dijo.	←	Dora said.
22	Está bien si vuelvo a las 10:30?, Gritó Dora a su madre!	←	Is it okay if I come back at 10:30? shouted Dora to her mother!
23	sé que u	←	do i know u
24	- Dijo Dora.	←	- said Dora.

25	Incapaz de cruzar el océano. Regresó a casa con las manos vacías.	←	Unable to cross the ocean. He returned home empty handed.
26	-exclamó Dora.	←	cried Dora.
27	, Exclamó Dora.	←	,cried Dora.
28	-Oh, no!-Exclamó Dora.	←	-oh no! cried Dora.
29	, Dijo Dora.	←	,said Dora.
30	- Gritó Dora.	←	- cried Dora.
31	exclamó Dora.	←	exclaimed Dora.
32	- Exclamó Dora en voz muy alta	←	- cried Dora very loudly
33	Dora dijo en un tono alegre.	←	Said Dora in a happy tone.
34	, Exclamó Dora.	←	,cried Dora.
35	Dora ha llorado.	←	Dora has cried.
36	Dora gritó,	←	Dora cried,
37	Dora dijo	←	Dora spoke
Final Translation: Said Dora.			

Table A.11: Translation Data Collected with MonoTrans Widgets, sentence 2 on page 12.

#	**Spanish (source)**		**English (target)**
Original	Sillas para sus alumnos, porque es maestro!		
	Sillas para sus alumnos, porque es maestro!	→	Chairs for their students, because it is perfect! (machine translation)
1	Sillas para sus alumnos, porque es perfecta!	←	Chairs for their students, because it is perfect!
2	Sillas para los estudiantes porque es perfecta!	→	Chairs for students because it is perfect!
3	Elegir sillas para los alumnos, ya que son perfectos.	←	Choose chairs for the students, because they are perfect.
4	Sillas para sus alumnos, porque es perfecto!	←	Chairs for their students because, it is perfect!
5	Elija las sillas para sus alumnos, porque son perfectos!	←	Choose chairs for their students, because they are perfect!
6	Elegir sillas para sus alumnos, ya que son perfectos!	←	Choose chairs for their students because they are perfect!
7	Sillas para sus alumnos, porque son perfectos!	←	Chairs for their students, because they are perfect!
8	Sillas para sus alumnos, porque él es un maestro!	←	Chairs for his students, because he is a teacher!
9	Es perfecto porque no hay sillas para los alumnos!	←	It is perfect because there are chairs for the students!

10	Sillas para sus alumnos, ya que es perfecto!	←	Chairs for their students because it is perfect!
11	Para hacer sillas para los estudiantes porque son perfectos!	←	To make chairs for students because they are perfect!
12	Sillas para los estudiantes lo hacen perfecto!	←	Chairs for their students make it perfect!
13	Sillas para los estudiantes, ya que, es perfecto!	←	Chairs for their students because, it is perfect!
14	Sillas para los estudiantes, porque es un maestro!	←	Chairs for their students, because it's a teacher!
15	Elegir sillas para los alumnos, ya que son perfectos!	←	Choose chairs for the students, because they are perfect!
16	Las sillas para los estudiantes son perfectos!	←	The chairs for the students are perfect!
17	Sillas para los estudiantes, ya que es perfecto!	←	Chairs for their students, because it's perfect!
18	Elegir sillas para los alumnos, ya que tienen que ser perfecto!	←	Choose chairs for the students, because they need to be perfect!
19	Tenemos que elegir sillas para los alumnos. Estos son perfectos!	←	We need to choose chairs for the students. These are perfect!
20	Se los utiliza para construir sillas para sus alumnos, ya que son perfectos para el trabajo!	←	He uses them to build chairs for his students because they are perfect for the job!
21	permite elegir las sillas de sus alumnos, porque son realmente perfecto!	←	lets Choose chairs for their students, because they are really perfect!
22	Elija las sillas para sus estudiantes, ya que son perfectos! Y bueno	←	Choose chairs for their students, because they are perfect! and good
23	Aplausos para sus estudiantes, ya que es perfecto!	←	Cheers for their students, because it is perfect!
24	Ellos eligieron las sillas porque eran perfectos para los estudiantes.	←	They chose the chairs because they were perfect for the students.
25	Ellos eligieron las sillas perfecto para sus estudiantes.	←	They chose the perfect chairs for their students.
Final Translation: Choose chairs for their students, because they are perfect!			

Table A.12: Translation Data Collected with MonoTrans Widgets, sentence 3 on page 12.

#	**Spanish (source)**		**English (target)**
Original	- afirmó julio.		

	- afirmó julio.	→	- Said in July. (machine translation)
1	- Dijo en julio.	←	- Said in July.
2	- Julio, dijo.	→	- Julio said.
3	- Dijo en julio.	→	- Said in July.
4	- Julio, dijo.	→	- Julio said.
5	Se dijo en julio.	←	It was said in July.
6	Se oyó, dijo en julio.	←	It was heard said in July.
7	- Dijo en julio.	←	- said in July.
8	- Dijo en julio.	←	- said in July.
9	Ella dijo que en julio.	←	She said in July.
10	- Dijo en julio.	←	- told in July.
11	- Dijo, en julio.	←	- said, in July.
12	- Dijo Julio.	←	- said Julio.
13	- Dijo en julio.	←	- she said in July.
14	- Dijo Emma en julio.	←	- said Emma in July.
15	dijo: En julio.	←	said, In July.
16	Fue en julio.	←	It was in July.
17	, Dijo Julio.	←	Said Julio.
18	Dijo que en julio.	←	He said in July.
19	, dijo Julio.	←	said July.
20	, dijo Julio.	←	said Julio.
21	Se dijo en julio. Lo dijo en julio.	←	It was said in July. They said it in July.
22	- Mencionado en el mes de julio.	←	- mentioned in July.
23	dijo en julio.	←	said in July.
24	Como se decidió en julio.	←	As was decided in July.
25	- Dijo Julio.	←	- said July.
26	dijo en julio.	←	said in July.
27	, dijo Julio.	→	said Julio.
28	Explicó Julio.	←	Explained Julio .
29	Julio dijo.	←	Julio said.
30	Julio explicó.	←	Julio explained.
31	explicó junior	←	explained Junior
32	, Dijo Julio.	←	, Julio said.
33	Julio dijo	←	Julio said
34	Julio-gritó a su novia	←	julio cried for his girlfriend
35	Julio dijo	←	Julio said
Final Translation: Julio explained.			

Table A.13: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 14.

#	**Spanish (source)**		**English (target)**
Original	Fernando y Alejandro no sabían qué cosa era un diente, pero prometieron que en cuanto tuvieran uno le avisarían a Alfredo,'		
	Fernando y Alejandro no sabían qué cosa era un diente, pero prometieron que en cuanto tuvieran uno le avisarían a Alfredo,'	→	Fernando and Alejandro did not know what it was a tooth, but promised that as soon as you would be warned to have an Alfredo ' (machine translation)
1	Fernando y Alejandro no sabía lo que era un diente, pero prometió que tan pronto como le avisarían en caso de tener un 'Alfredo	←	Fernando and Alejandro did not know what it was a tooth, but promised that as soon as you would be warned to have an Alfredo '
2	Fernando y Alejandro no sabía que era un diente, pero prometió que tan pronto tiene uno que usted se advirtió a Alfredo.	→	Fernando and Alejandro did not know it was a tooth, but promised that as soon have one you would be warned to Alfredo.
3	Fernando y Alejandro no sabía que era un diente, pero prometió que tan pronto como usted tiene un Alfredo advierten.	→	Fernando and Alejandro did not know it was a tooth, but promised that as soon as you have a warn Alfredo.
4	l y Alejandro no sabía lo que era un diente, pero prometió que tan pronto tiene uno que usted se advirtió a Alfredo.	→	He and Alexander did not know what it was a tooth, but promised that as soon have one you would be warned to Alfredo.
5	Fernando y Alejandro no sabía que se trataba de un diente. Prometieron que poco después se le advierte, que tendrá una 'Alfredo	←	Fernando and Alejandro did not know that it was a tooth. They promised that soon after you are warned, you will have an Alfredo '
6	Fernando y Alejandro no sabía si se trataba de un diente, pero prometió que tan pronto como se sabía que ibas a ser advertidos de que Alfredo '	←	Fernando and Alejandro did not know if it was a tooth, but they promised that as soon as they knew you would be warned about it Alfredo '

7	Fernando y Alejandro no sabía si se trataba de un diente, pero prometió que tan pronto como se supo, le avisarían al respecto, Alfredo ’	←	Fernando and Alejandro did not know if it was a tooth, but they promised that as soon as they knew, you would be warned about it, Alfredo ’
8	Fernando y Alejandro no sabía si se trataba de un diente, pero prometió que tan pronto como se supo, le avisarían en caso de que Alfredo ’	←	Fernando and Alejandro did not know if it was a tooth, but they promised that as soon as they knew, you would be warned about it Alfredo ’
9	Fernando y Alejandro no sabía que se trataba de un diente, pero prometió que advertir a Alfredo, tan pronto como sea posible.	←	Fernando and Alejandro did not know that it was a tooth, but promised they would warn Alfredo as soon as possible.
10	Fernando y Alejandro no sabía si se trataba de un diente, pero prometió que tan pronto como se supo Alfredo se advirtió al respecto ’	←	Fernando and Alejandro did not know if it was a tooth, but they promised that as soon as they knew Alfredo would be warned about it’
11	Fernando y Alejandro no sabía si se trataba de un diente, pero prometió que tan pronto como se sabía que ibas a ser advertido de ello, Alfredo ’	←	Fernando and Alejandro did not know if it was a tooth, but they promised that as soon as they knew you would be warned about it, Alfredo ’
12	Fernando y Alejandro no sabía si se trataba de un diente, pero prometió tan pronto como se sabía que ibas a ser advertidos de que Alfredo ’	←	Fernando and Alejandro did not know if it was a tooth, but they promised as soon as they knew you would be warned about it Alfredo ’
13	Fernando y Alejandro no sabía que se trataba de un diente, pero prometió que advertir a Alfredo, tan pronto como sea posible.	←	Fernando and Alejandro did not know that it was a tooth, but promised they would warn Alfredo as soon as possible.
14	Fernando y Alejandro no sabía que era un diente, pero han prometido sólo A’D decir Alfredo.	→	Fernando and Alejandro did not know it was a tooth, but have promised only a’d tell Alfredo.
15	Fernando y Alejandro no sabía que era un diente, pero prometió que sólo cuentan Alfredo.	←	Fernando and Alejandro did not know it was a tooth, but promised to tell only Alfredo.
16	Fernando y Alejandro no sabía que no era un diente, pero prometió que sólo cuentan Alfredo.	←	Fernando and Alejandro did not know it wasn’t a tooth, but promised to tell only Alfredo.

17	Fernando y Alejandro sabía que no era un diente, pero prometió que sólo cuentan Alfredo.	←	Fernando and Alejandro knew it wasn't a tooth, but promised to tell only Alfredo.
18	Fernando y Alejandro no sabía lo que era un diente, pero prometió que sólo cuentan Alfredo.	←	Fernando and Alejandro did not know what was a tooth, but promised to tell only Alfredo.
19	Diferente un cualquier Otro globo	←	diferente a cualquier otro globo
20	Fernando y Alejandro no sabía que era un diente, pero prometió que sólo cuentan Alfredo.	←	Fernando and Alejandro did not know it was a tooth, but they promised to tell only Alfredo.
21	Fernando y Alejandro no sabía que era un diente, pero prometió que sólo decirle a Alfredo.	←	Fernando and Alejandro did not know it was a tooth, but promised only to tell Alfredo.
22	Fernando y Alejandro, que no sabía que era un diente, pero prometió que iba a ser advertido.	→	Fernando and that Alexander did not know it was a tooth, but promised he would be warned.
23	Alejandro Fernando no sabía que era un diente, pero prometió que iba a ser advertido.	→	Alejandro Fernando and not know it was a tooth, but promised he would be warned.
24	Alejandro Fernando no sabía que era un diente, pero prometió que iba a buscar	→	Alejandro Fernando and not know it was a tooth, but promised that he would seek
25	Alejandro y Fernando no sabía que era un diente, pero prometió que iba a ser advertido.	←	Alejandro and Fernando not know it was a tooth, but promised he would be warned.
26	Alejandro Fernando no sabía que era un diente, pero prometió que iba a ser advertido.	←	Alejandro Fernando did not know it was a tooth, but promised he would be warned.
27	Alejandro Fernando no sabía que era un diente, pero prometió que pronto lo descubriría.	←	Alejandro Fernando did not know it was a tooth, but promised he would soon find out.
28	Alejandro Fernando no sabía lo que el diente se para, pero prometió averiguarlo.	←	Alejandro Fernando did not know what the tooth was for, but promised he would find out.
29	Alejandro y Fernando no sabía que era un diente, pero prometió que iba a ser advertido.	←	Alejandro and Fernando did not know it was a tooth, but promised he would be warned.
30	Alejandro y Fernando no sabía que era un diente, pero prometió que iba a ser advertido.	←	Alejandro and Fernand did not know it was a tooth, but promised he would be warned.
31	Alejandro y Fernando no sabía que era un diente, pero prometió que iba a ser advertido.	←	Alejandro and Fernando did not know it was a tooth, but they promised he would be warned.

32	Alejandro y Fernando no sabía que era un diente, pero prometió que iba a ser advertido.	←	Alejandro and Fernando did not know it was a tooth, but promised he would be warned.
33	Alejandro Fernando prometió que iba a ser advertido., Pero no sabía que era un diente.	←	Alejandro Fernando promised he would be warned., but he did not know it was a tooth.
34	Alejandro y Fernando no sabía que era un diente, pero se comprometieron a avisarle.	←	Alejandro and Fernando did not know it was a tooth, but they promised to warn him.
35	Alejandro y Fernando no sabía si era un diente, pero prometió que iba a ser advertido.	←	Alejandro and Fernando not know if it was a tooth, but promised he would be warned.
36	Alejandro Fernando no sabía que era un diente, pero prometió que iba a tener cuidado.	←	Alejandro Fernando did not know it was a tooth, but promised he would be careful.
37	Alejandro Fernando no sabía que era un diente, pero sabría muy pronto!	←	Alejandro Fernando did not know it was a tooth, but he would know soon enough!
38	Alejandro y Fernando no sabía que era un diente, pero prometió que iba a ser advertido.	←	Alejandro and Fernando didn't know it was a tooth, but promised he would be warned.
39	Alejandro y Fernando no sabía que era un diente, pero prometió que sería advertido.	←	Alejandro and Fernando not know it was a tooth, but promised they would be warned.
40	Alejandro y Fernando no sabía qué era un diente, pero prometieron que lo harían saber cuando lo hicieron.	←	Alejandro and Fernando did not know what a tooth is, but promised they would let him know when they did.
41	Alejandro y Fernando no sabía que era un diente, pero prometió que sería advertido.	←	Alejandro and Fernando did not know it was a tooth, but promised they would be warned.
42	Alejandro y Fernando no sabía que se trataba de un diente, pero prometió que iba a ser advertido.	←	Alejandro and Fernando did not know that it was a tooth, but promised he would be warned.
43	No sabía que era un diente, pero prometió que iba a ser advertido.	←	not know it was a tooth, but promised he would be warned.
44	Alejandro Fernando no sabía por qué el ratón quería que el diente, pero dijo que iba a meditar.	←	Alejandro Fernando did not know why the mouse wanted the tooth, but said he would ponder it.
45	Alejandro y Fernando no sabía que era un diente, pero prometió que sería advertido.	←	Alejandro and Fernando didn't know it was a tooth, but promised they would be warned.

46	Alejandro y Fernando no sabía que era un diente, pero prometió que iba a ser advertido.	←	Alejandro and Fernando did not know it was a tooth, but promised that he would be warned.
Final Translation: Alejandro Fernando did not know it was a tooth, but promised he would be warned.			

Table A.14: Translation Data Collected with MonoTrans Widgets, sentence 1 on page 14.

#	**Spanish (source)**		**English (target)**
Original	La investigación no le aclaraba nada!		
	La investigación no le aclaraba nada!	→	The research does not clarify anything! (machine translation)
1	La investigación no aclara nada!	←	The research does not clarify anything!
2	La investigación no aclara nada!	←	The research did not clarify anything!
3	Nada se aclara en esta investigación!	←	Nothing is clarified by this research!
4	Esta investigación no aclara nada.	←	This research does not clarify anything.
5	La investigación no aclaró nada!	←	The research did not clear up anything!
6	pequeos libros de oro	←	little golden books
7	Esta investigación no demuestra nada!	←	This research does not prove anything!
8	libros de texto para los alumnos de sexto	←	text book for 6th graders
9	Esta investigación aclara nada!	←	This research clarifies nothing!
10	Nada se aclara en esta investigación! Tenemos que mirar más	←	Nothing is clarified by this research! We need to look harder
11	cuento chino	←	chinese folktale
12	La investigación no aclaró nada!	←	The research did not clarify anything!
13	Todo lo que la investigación y todavía no lo sabía!	←	All that research and he still didn't know!
14	La investigación no tenía nada claro!	←	The research did not make anything clearer!
15	Los otros nios no ayuda en absoluto!	←	The other children did not help at all!
16	Esta investigación no aclara nada!	←	This research doesn't clarify anything!

17	Nada fue aclarado por la investigación!	←	Nothing was clarified by this research!
18	Esta investigación aclara nada!	←	This research clarified nothing!
19	No hay nada claro en esta investigación!	←	Nothing is made clear by this research!
Final Translation: The research did not clarify anything!			

Table A.15: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 16.

#	**Spanish (source)**		**English (target)**
Original	Alfredo esperó la noche, y al irse a dormir puso debajo de la almohada un diente, pero de ajo, para ver si engaaba al ratón.		
	Alfredo esperó la noche, y al irse a dormir puso debajo de la almohada un diente, pero de ajo, para ver si engaaba al ratón.	→	Alfredo waited night and going to bed put a pillow under the tooth, but garlic to see if they deceived the mouse. (machine translation)
1	Alfredo esperó la noche y va a la cama coloque una almohada debajo del diente, pero el ajo para ver si se engaó al ratón.	←	Alfredo waited night and going to bed put a pillow under the tooth, but garlic to see if they deceived the mouse.
2	Alfredo esperado para la noche, pero en lugar de un diente debajo de su almohada, decidió probar un poco de ajo para ver si podía engaar con el ratón.	←	Alfredo waited for night, but instead of putting a tooth under his pillow, he decided to try some garlic to see if that could deceive the mouse.
3	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada para ver si el ajo engaado con el ratón	←	Alfredo waited all night to go to bed and put the tooth under the pillow to see if garlic deceived the mouse
4	Alfredo esperado para la noche, pero en lugar de un diente debajo de su almohada, decidió poner un poco de ajo allí para ver si podían engaar al ratón.	←	Alfredo waited for night, but instead of putting a tooth under his pillow, he decided to put some garlic there to see if they could deceive the mouse.
5	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada, y para ver si el ajo engaado con el ratón.	←	Alfredo waited all night to go to bed and put the tooth under his pillow, and to see if garlic decieved the mouse.

6	Alfredo esperado para la noche, pero en lugar de un diente debajo de su almohada, decidió probar un poco de ajo para ver si podía engaar con el ratón.	←	Alfredo waited for night time, but instead of putting a tooth under his pillow, he decided to try some garlic to see if it could deceive the mouse.
7	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada, y para ver si el ajo sería engaar al ratón.	←	Alfredo waited all night to go to bed and put the tooth under the pillow, and to see if garlic would trick the mouse.
8	Alfredo esperaron toda la noche para ir a la cama, poner el diente debajo de la almohada, para ver si el ajo engaado con el ratón	←	Alfredo Waited all night to go to bed, put the tooth under the pillow, to see if garlic decieved the mouse
9	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada, y para ver si el ajo engaado con el ratón	←	Alfredo waited all night to go to bed and put the tooth under the pillow, and to see if garlic decieved the mouse
10	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada, y para ver si el ajo engaado con el ratón.	←	Alfredo waited all night to go to bed and put the tooth under the pillow, and to see if garlic decieved the mouse.
11	Alfredo esperado para la noche, pero en lugar de un diente debajo de su almohada, decidió probar un poco de ajo para ver si podían engaar al ratón.	←	Alfredo waited for night, but instead of putting a tooth under his pillow, he decided to try some garlic to see if they could deceive the mouse.
12	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada, y para ver si el ajo engaado con el ratón	←	Alfredo Waited all night to go to bed and put the tooth under the pillow, and to see if garlic decieved the mouse
13	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada. Esperaron a ver si el ajo sería engaar al ratón.	←	Alfredo Waited all night to go to bed and put the tooth under the pillow. They waited to see if the garlic would deceive the mouse.
14	Alfredo esperaba la noche para caer, pero en vez de poner un diente debajo de su almohada, decidió probar un poco de ajo para ver si podían engaar al ratón.	←	Alfredo waited for night to fall, but instead of putting a tooth under his pillow, he decided to try some garlic to see if they could deceive the mouse.

15	Alfredo esperaron toda la noche antes de ir a la cama. Lugar de colocar un diente bajo la almohada, poner un pedazo de ajo para ver si podían engaar al ratón.	←	Alfredo waited all night before going to bed. Instead of placing a tooth under the pillow he put a piece of garlic to see if they could deceive the mouse.
16	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada, y para ver si el ajo engaado con el ratón	←	Alfredo waited all night to go to bed and put the tooth under the pillow, and to see if garlic deceived the mouse
17	Alfredo esperaron toda la noche para ir a la cama. Puso el diente debajo de la almohada que quería ver si el ajo engaado con el ratón	←	Alfredo waited all night to go to bed. He put the tooth under the pillow he wanted to see if garlic decieved the mouse
18	Alfredo esperó hasta la hora de acostarse, pero en lugar de un diente debajo de su almohada, decidió probar un poco de ajo para ver si podían engaar al ratón.	←	Alfredo waited until bedtime, but instead of putting a tooth under his pillow, he decided to try some garlic to see if they could deceive the mouse.
19	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada, para ver si el ajo engaado con el ratón	←	Alfredo Waited all night to go to bed and put the tooth under the pillow, to see if garlic decieved the mouse
20	Alfredo esperaron toda la noche para ir a la cama y poner el diente debajo de la almohada, y para ver si el ajo engaado con el ratón	←	Alfredo Waited all night to go to bed and put the tooth under the pillow, and to see if garlic deceived the mouse
21	Alfredo esperó hasta el anochecer, y antes de irse a la cama poner un diente de ajo debajo de la almohada para engaar a los ratones.	→	Alfredo waited until dark, and before going to bed put a clove of garlic under your pillow to trick the mouse.
22	Alfredo esperó hasta el anochecer, y antes de irse a la cama poner un diente de ajo debajo de la almohada para engaar a los ratones.	→	Alfredo waited until nightfall, and before going to bed put a garlic clove under the pillow to fool the mice.
23	Alfredo esperó hasta el anochecer, y antes de irse a la cama poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed put a clove of garlic under his pillow to trick the mouse.
24	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed He put a clove of garlic under his pillow to trick the mouse.

25	Alfredo esperó hasta el anochecer y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark and before going to bed, put a clove of garlic under the pillow to trick the mouse.
26	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed, put a clove of garlic under the pillow to trick the mouse.
27	Alfredo esperó hasta el anochecer, y poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and put a clove of garlic under his pillow to trick the mouse.
28	Alfredo esperó hasta el anochecer, y antes de irse a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed, he put a clove of garlic under the pillow to trick the mouse.
29	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark and, before going to bed, put a clove of garlic under his pillow to trick the mouse.
30	Alfredo esperó hasta el anochecer. Con el fin de engaar a la del ratón, se puso un diente de ajo debajo de la almohada antes de ir a la cama.	←	Alfredo waited until dark. In order to trick the mouse, he put a clove of garlic under the pillow before going to bed.
31	Alfredo esperó hasta el anochecer, y antes de irse a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed, he put a clove of garlic under his pillow to trick the mouse.
32	Alfredo esperó hasta el anochecer, y luego, rápidamente y en silencio, antes de ir a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark and then, quickly and quietly, before going to bed, he put a clove of garlic under his pillow to trick the mouse.
33	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada.	←	Alfredo waited until dark, and before going to bed, put a clove of garlic under the pillow.
34	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	→	Alfredo waited until nightfall, and before going to bed, put a garlic clove under the pillow to fool the mice.

35	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until nightfall, and before going to bed, put a garlic clove under the pillow to fool the mice.
36	Alfredo esperó hasta el anochecer, y antes de irse a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until nightfall, and before going to bed, he put a garlic clove under the pillow to fool the mice.
37	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed, put a garlic clove under the pillow to fool the mice.
38	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed, put a garlic clove under the pillow to fool the mice.
39	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and, before going to bed, put a garlic clove under the pillow to fool the mice.
40	Alfredo esperó hasta el anochecer, y antes de irse a la cama, se puso un diente de ajo debajo de la almohada para engaar a la hada de los dientes del ratón.	←	Alfredo waited until nightfall, and before going to bed, he put a garlic clove under the pillow to fool the tooth fairy mouse.
41	Alfredo esperó hasta el anochecer, y antes de irse a la cama poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed put a garlic clove under the pillow to fool the mice.
42	Alfredo esperó hasta el anochecer, y antes de irse a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed, he put a garlic clove under the pillow to fool the mice.
43	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until nightfall, and before going to bed, put a garlic clove under the pillow to fool the mice.
44	Alfredo esperó hasta el anochecer, entonces antes de ir a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until nightfall, then before going to bed, put a garlic clove under the pillow to fool the mice.

45	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed, put a garlic clove under his pillow to fool the mice.
46	Alfredo esperó hasta el anochecer, y antes de irse a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark and, before going to bed, he put a garlic clove under the pillow to fool the mice.
47	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark and, before going to bed, put a garlic clove under the pillow to fool the mice.
48	Al caer la noche, Alfredo poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	At nightfall, Alfredo put a garlic clove under the pillow to fool the mice.
49	Alfredo esperó hasta el anochecer, y antes de irse a la cama, a continuación, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until nightfall, and before going to bed, then put a garlic clove under the pillow to fool the mice.
50	Alfredo esperó hasta el anochecer, y antes de irse a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until nightfall, and before going to bed, he put a garlic clove under his pillow to fool the mice.
51	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until nightfall, and before going to bed, put a garlic clove under the pillow to fool the mice.
52	Alfredo esperó hasta el anochecer, antes de ir a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, before going to bed, he put a garlic clove under the pillow to fool the mice.
53	Alfredo esperó hasta el anochecer, antes de ir a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, before going to bed he put a garlic clove under the pillow to fool the mice.
54	Alfredo esperó hasta el anochecer, y antes de irse a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, and before going to bed,he put a garlic clove under the pillow to fool the mice.

55	Alfredo esperó hasta el anochecer, y antes de irse a la cama, poner un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until nightfall, and before going to bed, put a garlic clove under his pillow to fool the mice.
56	Alfredo esperó hasta el anochecer, entonces antes de ir a la cama, se puso un diente de ajo debajo de la almohada para engaar a los ratones.	←	Alfredo waited until dark, then before going to bed, he put a garlic clove under the pillow to fool the mice.
Final Translation: Alfredo waited until nightfall, and before going to bed, put a garlic clove under the pillow to fool the mice.			

Table A.16: Translation Data Collected with MonoTrans Widgets, sentence 1 on page 16.

#	**Spanish (source)**		**English (target)**
Original	En la maana, cuando despertó, el diente de ajo estaba en el mismo lugar y no había huellas del ratón.		
	En la maana, cuando despertó, el diente de ajo estaba en el mismo lugar y no había huellas del ratón.	→	In the morning when he awoke, the garlic was in the same place and there were no traces of the mouse. (machine translation)
1	Por la maana, cuando despertó, el ajo estaba en el mismo lugar y no había rastros del ratón.	←	In the morning when he awoke, the garlic was in the same place and there were no traces of the mouse.
2	Por la maana, cuando despertó, el ajo estaba en el mismo lugar y no había rastros del ratón.	←	In the morning, when he awoke, the garlic was in the same place and there were no traces of the mouse.
3	Por la maana, cuando despertó, el ajo estaba en el mismo lugar y no había ni rastro del ratón.	←	In the morning when he awoke, the garlic was in the same place and there was no trace of the mouse.
4	Por la maana, cuando despertó, el ajo fue en el mismo lugar, y no había ni rastro del ratón.	←	In the morning when he awoke, the garlic was in the same place, and there was no trace of the mouse.
5	Cuando se despertó por la maana, el ajo fue en el mismo lugar, y no había ni rastro del ratón.	→	When he awoke in the morning, the garlic was in the same place, and there was no trace of the mouse.

6	Por la maana, cuando despertó, el ajo estaba en el mismo lugar y no había ni rastro del ratón.	→	In the morning when he awoke, the garlic was in the same place and there was no trace of the mouse.
7	Cuando se despertó por la maana, no había ni rastro del ratón y el ajo se encontraba en el mismo lugar.	←	When he awoke in the morning, there was no trace of the mouse and the garlic was in the same place.
8	En la maana cuando se levantó, el ajo estaba en el mismo lugar y no había ni rastro del ratón.	←	In the morning when he got up, the garlic was in the same place and there was no trace of the mouse.
9	Cuando se levantó por la maana, no había ni rastro del ratón y el ajo se encontraba en el mismo lugar.	←	When he got up in the morning, there was no trace of the mouse and the garlic was in the same place.
10	Por la maana, cuando se levantó, el ajo estaba en el mismo lugar y no había ni rastro del ratón.	←	In the morning, when he got up, the garlic was in the same place and there was no trace of the mouse.
11	En la maana, cuando Alfredo se levantó, el ajo fue en el mismo lugar, y no había ni rastro del ratón.	←	In the morning when Alfredo got up, the garlic was in the same place, and there was no trace of the mouse.
12	Cuando se despertó por la maana, no había rastro del ratón y el ajo se encontraba en el mismo lugar.	←	When he awoke in the morning, there was not a trace of the mouse and the garlic was in the same place.
13	En la maana cuando se levantó, el ajo fue en el mismo lugar, y no había ni rastro del ratón.	←	In the morning when he got up, the garlic was in the same place, and there was no trace of the mouse.
14	Cuando se despertó por la maana, no había ni rastro del ratón, y el ajo se encontraba en el mismo lugar.	←	When he awoke in the morning, there was no trace of the mouse, and the garlic was in the same place.
15	No había rastro del ratón cuando se despertó por la maana, y el ajo se encontraba en el mismo lugar.	←	There was no trace of the mouse when he awoke in the morning, and the garlic was in the same place.

16	En la maana cuando se levantó, el queso estaba en el mismo lugar y no había ni rastro del ratón.	←	In the morning when he got up, the cheese was in the same place and there was no trace of the mouse.
17	Cuando se despertó por la maana, no había ni rastro del ratón y el ajo se encontraba en el mismo lugar.	←	When he woke up in the morning, there was no trace of the mouse and the garlic was in the same place.
18	El ajo fue en el mismo lugar cuando se levantaba por la maana, y no había ni rastro del ratón.	←	The garlic was in the same place when he got up in the morning, and there was no trace of the mouse.
19	Cuando se despertó por la maana, no había ni rastro del ratón y el ajo se encontraba en el mismo lugar.	←	When he awoke in the morning, there was no trace of the mouse and the garlic was in the same place.
20	Cuando se despertó por la maana, no había ni rastro del ratón y el ajo se encontraba en el mismo lugar.	←	When he woke in the morning, there was no trace of the mouse and the garlic was in the same place.
21	Cuando se despertó, no había ni rastro del ratón y el ajo se encontraba en el mismo lugar.	←	When he woke up, there was no trace of the mouse and the garlic was in the same place.
22	Cuando se despertó por la maana, no había ni rastro del ratón y el ajo se encontraba todavía en el mismo lugar.	←	When he awoke in the morning, there was no trace of the mouse and the garlic was still in the same place.
23	A la maana siguiente, Alfredo encontró que el ajo era en el mismo lugar, y no había ni rastro del ratón.	←	The next morning, Alfredo found that the garlic was in the same place, and there was no trace of the mouse.
24	En la maana cuando se despertó, el ajo estaba en el mismo lugar y no había ni rastro del ratón.	←	In the morning when he woke up, the garlic was in the same place and there was no trace of the mouse.
25	Cuando se despertó por la maana no había ni rastro del ratón, y el ajo se encontraba en el mismo lugar.	←	When he awoke in the morning there was no trace of the mouse, and the garlic was in the same place.
26	al amanecer, se levanta, se la había dejado Dode ajo y había dejado ningún rastro girar	→	at dawn, get up, was the garlic dode had left and had left no trace rotate

27	Al amanecer, se levantó, y no había ni rastro del ratón, y el ajo todavía estaba allí.	←	At dawn, he got up, and there was no trace of the mouse, and the garlic was still there.
28	No quiero hacer esto!	←	I don't wanna do this!
29	No quiero hacer esto!	←	I don't want to do this!
30	Al amanecer, se levantó, no había ni rastro del ratón, y el ajo todavía estaba allí.	←	At dawn, he got up, there was no trace of the mouse, and the garlic was still there.
31	No quiero hacer esto!, Dijo.	←	I don't wanna do this! he said.
32	No quiero hacer esto!	←	I don't wanna do this!
33	"No quiero hacer esto!"	←	"I don't wanna do this!"
34	No quiero hacer esto!	←	I don't want to do this!
35	Al amanecer, se levantó, y no había ni rastro del ratón, y el ajo todavía estaba allí.	←	At dawn he got up, and there was no trace of the mouse, and the garlic was still there.
36	No quiero hacer esto! No quiero hacer esto!	←	I don't wanna do this! I don't want to do this!
37	Cuando se levantó al amanecer, no había ni rastro del ratón, y el ajo era virgen todavía.	←	When he got up at dawn, there was no trace of the mouse, and the garlic was still untouched.
38	Al amanecer, se levantó. No había rastro del ratón, pero el ajo todavía estaba allí.	←	At dawn, he got up. There was no trace of the mouse, but the garlic was still there.
39	Al amanecer, se despertó y no encontró ningún rastro del ratón, sin embargo, el ajo todavía estaba allí.	←	At dawn, he woke up and found no trace of the mouse, however the garlic was still there.
40	Al amanecer, se levantó y no había ni rastro del ratón y el ajo todavía estaba allí.	←	At dawn, he got up and there was no trace of the mouse and the garlic was still there.
41	Al amanecer, se levantó y no había ni rastro del ratón, pero el ajo todavía estaba allí.	←	At dawn, he got up and there was no trace of the mouse, but the garlic was still there.
42	Al amanecer, se levantó, el ajo todavía estaba allí, pero no había rastro del ratón.	←	At dawn, he got up, the garlic was still there but there was no trace of the mouse.
43	No puedo hacer esto!	←	i cant do this!
44	No quiero hacer esto!	←	I do not want to do this!
45	Al amanecer, cuando se levantó no había ni rastro del ratón, pero el ajo todavía estaba allí.	←	At dawn, when he got up there was no trace of the mouse, but the garlic was still there.
Final Translation: I don't wanna do this!			

Table A.17: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 19.

#	**Spanish (source)**		**English (target)**
Original	La siguiente noche, sin ser visto por nadie, metió debajo de la almohada los dientes postizos de la abuela y se durmió, seguro que e— ratón vendría atraído por ese collar de dientes blancos.		
	La siguiente noche, sin ser visto por nadie, metió debajo de la almohada los dientes postizos de la abuela y se durmió, seguro que e— ratón vendría atraído por ese collar de dientes blancos.	→	The next night, unseen by anyone, put it under your pillow the grandmother's dentures and fell asleep, certain that e — mouse would attracted to the necklace of white teeth. (machine translation)
1	La noche siguiente, sin ser visto por nadie, lo pone debajo de la almohada prótesis de la abuela y se quedó dormido, seguro de que e — mouse se atraído por el collar de dientes blancos.	←	The next night, unseen by anyone, put it under your pillow the grandmother's dentures and fell asleep, certain that e — mouse would attracted to the necklace of white teeth.
2	La noche siguiente, sin ser visto por nadie, se puso prótesis de la de su abuela debajo de la almohada y se durmió, seguro de que el ratón se sentirían atraídos por el collar de dientes blancos.	←	The next night, unseen by anyone, he put the his grandmother's dentures under his pillow and fell asleep, certain that the mouse would be attracted to the necklace of white teeth.
3	La noche siguiente, sin ser visto por nadie, dentaduras postizas de la abuela debajo de la almohada y se durmió, seguro de que el ratón se sentirían atraídos por el collar de dientes blancos.	←	The next night, unseen by anyone, he the grandmother's dentures under his pillow and fell asleep, certain that the mouse would be attracted to the necklace of white teeth.
4	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, seguro de que el ratón se sentirían atraídos por el collar de dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, certain that the mouse would be attracted to the necklace of white teeth.

5	La noche siguiente, sin ser visto por nadie, lo pone debajo de la almohada prótesis de la abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el collar de dientes blancos.	←	The next night, unseen by anyone, put it under your pillow the grandmother's dentures and fell asleep, certain that the mouse would be attracted to the necklace of white teeth.
6	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, seguro de que el ratón se sentirían atraídos por el conjunto de dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, certain that the mouse would be attracted to the set of white teeth.
7	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, estaba seguro de que el ratón que atraen al conjunto de dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, was certain that the mouse would attract to the set of white teeth.
8	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, seguro de que el ratón se atrajo a la serie de dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, certain that the mouse would attracted to the set of white teeth.
9	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, seguro de que el ratón se sentirían atraídos por el collar de dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under the pillow and fell asleep, certain that the mouse would be attracted to the necklace of white teeth.
10	La noche siguiente, sin que nadie lo viera, escondió la dentadura postiza de la abuela debajo de la almohada y se durmió, seguro de que el ratón se sentirían atraídos por el collar de dientes blancos.	→	The next night, without anyone seeing him, he hid the grandmother's false teeth under the pillow and fell asleep, certain that the mouse would be attracted to the necklace of white teeth.
11	La noche siguiente, sin ser visto por nadie, lo pone debajo de la almohada prótesis de la abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el cuello de los dientes blancos.	→	The next night, unseen by anyone, put it under your pillow the grandmother's dentures and fell asleep, confident that the mouse would be attracted to the collar of white teeth.

12	La noche siguiente, sin que nadie lo viera, se puso la dentadura postiza de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el collar de dientes blancos.	→	The next night, without anyone seeing him, he put his grandmother's false teeth under the pillow and fell asleep, confident that the mouse would be attracted to the necklace of white teeth.
13	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of the white teeth.
14	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
15	La noche siguiente, sin ser visto por nadie, lo pone debajo de la almohada prótesis de la abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, put it under your pillow the grandmother's dentures and fell asleep, confident that the mouse would be attracted to the color of white teeth.
16	La noche siguiente, sin ser visto por cualquier persona, se la puso debajo de la almohada con las dentaduras de la abuela y se quedó dormido, seguro de que el ratón se sientan atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put it under your pillow with the grandmother's dentures and fell asleep, confident that the mouse would be attracted by the color of white teeth.
17	La noche siguiente, sin que nadie le puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, without anyone him, he put the grandmother's dentures under the pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.

18	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
19	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
20	La noche siguiente, sin ser visto por cualquier persona, poner prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
21	La siguiente noche, secretamente dentaduras sus abuelas de debajo de la almohada y quedarse dormido. Tengo confianza de que el ratón se sentirán atraídos por el color de los dientes blancos.	←	The next night, secretly put your grandmothers's dentures under your pillow and fall asleep. I confident that the mouse will be attracted to the color of white teeth.
22	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió. Confiaba en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep. He was confident that the mouse would be attracted to the color of white teeth.
23	La noche siguiente, sin ser visto por nadie, se puso debajo de su almohada dentadura de su abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put under his pillow his grandmother's dentures and fell asleep, confident that the mouse would be attracted to the color of white teeth.
24	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sientan atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted by the color of white teeth.

25	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió. Confiaba en que el ratón se sentirían atraídos por el conjunto de dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep. He was confident that the mouse would be attracted to the set of white teeth.
26	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sientan atraídos por los brillantes dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted by the bright white teeth.
27	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el conjunto de dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the set of white teeth.
28	La noche siguiente, sin ser visto por nadie, lo pone debajo de la almohada, las dentaduras postizas de la abuela, y se quedó dormido seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, put it under your pillow, the grandmother's dentures, and fell asleep confident that the mouse would be attracted to the color of white teeth.
29	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el conjunto de dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under the pillow and fell asleep, confident that the mouse would be attracted to the set of white teeth.
30	La noche siguiente, sin ser visto por nadie, se puso prótesis abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
31	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sientan atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted by the color of white teeth.

32	La siguiente noche, cuando nadie lo vio, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, when no one saw him, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
33	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada, confiando en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under the pillow, confident that the mouse would be attracted to the color of the white teeth.
34	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep, sure that the mouse would be attracted to the color of the white teeth.
35	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color blanco de teeth.That quiz # 1 - 2 minutos de perforación de multiplicación (40 básicos)	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.That quiz #1 - 2min multiplication drill (40 basic)
36	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of the white teeth.
37	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió. H estaba seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow and fell asleep. H was confident that the mouse would be attracted to the color of white teeth.

38	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada, confiando en que el ratón se sentirían atraídos por el color de los dientes blancos. Luego se fue a dormir.	←	The next night, unseen by anyone, he put his grandmother's dentures under the pillow, confident that the mouse would be attracted to the color of white teeth. Then he went to sleep.
39	El próximo nee por nadie, lo pone debajo de la almohada prótesis de la abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next nee by anyone, put it under your pillow the grandmother's dentures and fell asleep, confident that the mouse would be attracted to the color of white teeth.
40	La noche siguiente, sin que nadie se busca, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, without anyone looking, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
41	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under your pillow, and fell asleep, confident that the mouse would be attracted to the color of white teeth.
42	La siguiente noche, cuando nadie te puede ver, poner prótesis de su abuela debajo de la almohada y quedarse dormido, seguro de que el ratón se sentirán atraídos por el color de los dientes blancos.	←	The next night, when nobody can see you, put your grandmother's dentures under your pillow and fall asleep, confident that the mouse will be attracted to the color of white teeth.
43	La noche siguiente, sin ser visto por nadie, puesto que las prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, you put your grandmother's dentures under your pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
44	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió. Confiaba en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anybody, he put his grandmother's dentures under the pillow and fell asleep. He was confident that the mouse would be attracted to the color of white teeth.

45	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone,he put his grandmother's dentures under the pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
46	La noche siguiente, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
47	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela en su pillowand se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put grandmother's dentures under his pillowand fell asleep, confident that the mouse would be attracted to the color of white teeth.
48	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de la almohada y se durmió - confía en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under the pillow and fell asleep - confident that the mouse would be attracted to the color of white teeth.
49	La noche siguiente, sin ser visto por nadie, se puso debajo de la almohada dentadura de la abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put under your pillow the grandmother's dentures and fell asleep, confident that the mouse would be attracted to the color of white teeth.
50	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió. Confiaba en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep. He was confident that the mouse would be attracted to the color of white teeth.
51	A la noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.

52	La noche siguiente, sin ser visto por nadie, se puso prótesis abuela debajo de su almohada, confiando en que el ratón se sentirían atraídos por el color de los dientes blancos y se quedó dormido,.	←	The next night, unseen by anyone, he put grandmother's dentures under his pillow, confident that the mouse would be attracted to the color of white teeth and fell asleep, .
53	La noche siguiente, sin ser visto por cualquier persona, poner prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, put the grandmother's dentures under your pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
54	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the colour of white teeth.
55	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under the pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
56	La noche siguiente, todos los desapercibida, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, all unnoticed, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
57	La noche siguiente, sin ser visto por cualquier persona, poner la dentadura de la abuela debajo de la almohada y quedarse dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, put Grandmother's denture under your pillow and fall asleep, confident that the mouse would be attracted to the color of white teeth.

58	La noche siguiente, todos los invisibles, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, all unseen, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
59	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep; confident that the mouse would be attracted to the color of white teeth.
60	La noche siguiente, mientras que nadie miraba, se puso prótesis de su abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, while no one was looking, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of the white teeth.
61	La noche siguiente, sin ser visto por nadie, se puso debajo de su almohada dentadura de la abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put under his pillow the grandmother's dentures and fell asleep, confident that the mouse would be attracted to the color of white teeth.
62	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela debajo de la almohada y se durmió, la confianza de que el ratón se sentirían atraídos por el color de los dientes postizos de color blanco nacarado.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of pearly white fake teeth.
63	Conocer el ratón se sentirían atraídos por el color blanco de las prótesis dentales de la abuela, que sigilosamente ponerlas bajo la almohada.	←	Knowing the mouse would be attracted to the white color of grandma's dentures, he stealthily put them under his pillow.
64	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela bajo su almohada y se durmió, confiado en que el ratón se sientan atraídos por el color blanco de los dientes.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted by the white color of the teeth.

65	La noche siguiente, sin ser vistos por anyonthe puso prótesis de la abuela bajo su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyonthe he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
66	La noche siguiente, sin ser visto por nadie, puesto bajo las dentaduras mi abuela almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, I put under my pillow grandmother's dentures, and fell asleep, confident that the mouse would be attracted to the color of white teeth.
67	Voici une histoire qui parle ma petite soeur de et de moi	←	Voici une histoire qui parle de ma petite soeur et de moi
68	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela bajo su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, he unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
69	La noche siguiente, sin ser visto por nadie, se puso la dentadura postiza abuelas debajo de la almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmothers dentures under the pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
70	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela bajo la almohada. Se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures under his pillow. He fell asleep, confident that the mouse would be attracted to the color of white teeth.
71	La siguiente noche, en secreto poner dientes postizos de su abuela debajo de la almohada con la esperanza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, he secretly put his grandmother's false teeth under his pillow hoping that the mouse would be attracted to the color of white teeth.

72	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela bajo su almohada y se quedó dormido, seguro de que el ratón se sentirían atraídos por el conjunto de dientes blancos.	←	The next night, without being seen by anyone, he put the grandmother's dentures under his pillow and fell asleep, sure that the mouse would be attracted to the set of white teeth.
73	La noche siguiente, sin que nadie lo vea, se puso prótesis de la abuela bajo su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night,without anyone seeing, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
74	La noche siguiente, sin ser visto por nadie, tomó las dentaduras de la abuela, puso bajo su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, took grandmother's dentures, put them under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
75	La siguiente noche, en secreto puesto la dentadura postiza abuelas debajo de su almohada. Sabía que el ratón se como los dientes de color blanco brillante.	←	The next night, he secretly put his grandmothers dentures under his pillow. He knew the mouse would like the bright white teeth.
76	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela bajo su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos. Pensando que se trataba de queso blanco.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth. Thinking it was white cheese.
77	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela bajo la almohada y se durmió, sintiendo la confianza de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under the pillow and fell asleep, feeling confident that the mouse would be attracted to the color of white teeth.
78	La noche siguiente, delante de todos, se puso prótesis de la abuela debajo de la almohada y esperó con su arma, confía en que el alce se sentirían atraídos por los dientes de color de queso.	←	The next night, in front of everyone, he put Grandmother's dentures under his pillow and waited with his gun, confident that the moose would be attracted to the cheese-colored teeth.

79	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela bajo su almohada y se durmió, confiado en que el ratón se sentirán atraídos por los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted by the white teeth.
80	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela en su pillowand se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put the grandmother's dentures under his pillowand fell asleep, confident that the mouse would be attracted to the color of white teeth.
81	La noche siguiente, sin ser visto por cualquier persona, se la puso debajo de la almohada dentadura de la abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put it under your pillow the grandmother's dentures and fell asleep, confident that the mouse would be attracted to the color of white teeth.
82	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela bajo su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de sus dientes blancos.	←	The next night, unseen by anyone, he put grandma's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of her white teeth.
83	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela bajo su almohada y se durmió. Confiaba en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put grandma's dentures under his pillow and fell asleep. He was confident that the mouse would be attracted to the color of the white teeth.
84	La noche siguiente, sin ser visto por cualquier persona, se la puso debajo de la almohada (?) Prótesis de la abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put it under the pillow (?) the grandmother's dentures and fell asleep, confident that the mouse would be attracted to the color of white teeth.
85	La noche siguiente, confiando en que el ratón se sentirían atraídos por los dientes blancos, puso la dentadura postiza debajo de su almohada y se durmió	←	The next night, confident that the mouse would be attracted to white teeth, he put his dentures under his pillow and fell asleep

86	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela debajo de su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone,he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
87	La noche siguiente, sin ser visto, se puso prótesis de la abuela bajo su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color blanco de los dientes.	←	The next night, unseen, he put grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the white colour of the teeth.
88	Este es el pop-up más molesto. Podría arreglarlo?	←	This is the most annoying pop-up. Would you PLEASE fix it?
89	La noche siguiente, sin ser visto por cualquier persona, se la puso debajo de su almohada dentadura de la abuela y se quedó dormido, seguro de que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put it under his pillow the grandmother's dentures and fell asleep, confident that the mouse would be attracted to the color of white teeth.
90	La noche siguiente, él secretamente dentaduras abuela debajo de su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, he secretly put grandmother's dentures under his pillow the and fell asleep, confident that the mouse would be attracted to the color of white teeth.
91	La noche siguiente, sin ser visto por cualquier persona, poner prótesis de su abuela debajo de su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
92	La noche siguiente, sin ser visto por nadie, se puso prótesis de su abuela por debajo de su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone, he put his grandmother's dentures underneath his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.

93	La noche siguiente, sin ser visto por nadie, se puso prótesis de la abuela bajo su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen by anyone,he put grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
94	La noche siguiente, sin ser visto, se puso prótesis de su abuela debajo de su almohada y se durmió, confiado en que el ratón se sentirían atraídos por el color de los dientes blancos.	←	The next night, unseen, he put his grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.
Final Translation: The next night, unseen by anyone, he put the grandmother's dentures under his pillow and fell asleep, confident that the mouse would be attracted to the color of white teeth.			

Table A.18: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 20.

#	**Spanish (source)**		**English (target)**
Original	Despertó emocionado al escuchar un ruido en el cuarto y al encender la luz, la pequea figura era...		
	Despertó emocionado al escuchar un ruido en el cuarto y al encender la luz, la pequea figura era...	→	He woke up excited to hear a noise in the room and switched on the light, the small figure was ... (machine translation)
1	Se despertó emocionada de oír un ruido en la habitación y encendió la luz, la pequea figura era ...	←	He woke up excited to hear a noise in the room and switched on the light, the small figure was ...
2	Se despertó, emocionado de escuchar un ruido en la habitación, y encendió la luz para ver que la pequea figura que se ...	←	He woke up, excited to hear a noise in the room, and switched on the light to see that the small figure was ...
3	Se despertó emocionada de oír un ruido en la habitación y encendió la luz. La pequea figura que vio fue ...	←	He woke up excited to hear a noise in the room and switched on the light. The small figure he saw was ...
4	Se despertó sobresaltado al escuchar un ruido en la habitación, y encendió la luz para ver que la pequea figura que se ...	←	He woke up, startled to hear a noise in the room, and switched on the light to see that the small figure was ...

5	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver lo que la pequea figura era ...	←	He woke up, excited to hear a noise in the room, and switched on the light to see what the small figure was ...
6	Se despertó, emocionado de escuchar un ruido en la habitación. Encendió la luz para ver que la pequea figura que se ...	←	He woke up, excited to hear a noise in the room. He switched on the light to see that the small figure was ...
7	Se despertó, starteld oír un ruido en la habitación, y encendió la luz para ver que la pequea figura que se ...	←	He woke up, starteld to hear a noise in the room, and switched on the light to see that the small figure was ...
8	Al oír un ruido en la habitación, se despertó entusiasmo y encendió la luz para ver que la pequea figura que se ...	←	Upon hearing a noise in the room, he woke up excitedly and switched on the light to see that the small figure was ...
9	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que ...	→	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that ...
10	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que fue.	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was.
11	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que se ...	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ...
12	Se despertó, emocionado de escuchar un ruido en la habitación, y encendió la luz para ver una pequea figura que se ...	←	He woke up, excited to hear a noise in the room, and turned on the light to see a small figure that was ...
13	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que se ...	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was ...
14	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que fue. Una hormiga ..	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was . a ant..

15	Se despertó, emocionado de escuchar un ruido en la habitación, y encendió la luz para ver la pequea figura que se ...	←	He woke up, excited to hear a noise in the room, and turned on the light to see the small figure that was ...
16	Se despertó, excitado por el ruido que oyó en la habitación y encendió la luz para ver una pequea figura que se ...	←	He woke up, excited by the noise he heard in the room, and turned on the light to see a small figure that was ...
17	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que fue ...	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was ...
18	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver que la pequea figura que se ...	←	He woke up, excited to hear a noise in the room and turned on the light to see that the small figure was ...
19	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que fue ... una rata grande miedo	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ... a big scary rat
20	Se despertó sobresaltado por un ruido en la habitación, y encendió la luz para ver una pequea figura que se ...	←	He woke up, startled by a noise in the room, and turned on the light to see a small figure that was ...
21	Se despertó, emocionado de escuchar el ruido en la habitación y encendió la luz para ver una pequea figura que se ...	←	He woke up, excited to hear the noise in the room and turned on the light to see a small figure that was ...
22	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que fue ...	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ...
23	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura de ...	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure of...
24	Oyó un ruido en la habitación y me desperté emocionado. Encendió la luz para ver una pequea figura que se ...	←	He heard a noise in the room and woke up excited. He turned on the light to see a small figure that was ...

25	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que fue ...	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ...
26	Se despertó sobresaltado por un ruido en la habitación. Encendió la luz para ver una pequea figura que se ...	←	He woke up, startled by a noise in the room. He turned on the light to see a small figure that was ...
27	Se despertó, emocionado de escuchar un ruido en la habitación. Encendió la luz para ver una pequea figura que se ...	←	He woke up, excited to hear a noise in the room. He turned on the light to see a small figure that was ...
28	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que fue ... un hombre de bloqueo de mí	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ... a man locking at me
29	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que fue ... un hombre que me mira	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ... a man looking at me
30	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver el día pequea figura	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure th
31	Se despertó y emocionado de escuchar un ruido en la habitación. Encendió la luz para ver una pequea figura que se ...	←	He woke up and excited to hear a noise in the room. He turned on the light to see a small figure that was ...
32	Se despertó al oír un ruido en la habitación y encendió la luz para ver una pequea figura que se ...	←	He woke up to hear a noise in the room and turned on the light to see a small figure that was ...
33	Se despertó entusiasmo, porque oyó un ruido en la habitación. Encendió la luz y vio que era algo pequeo ...	←	He woke up excitedly because he heard a noise in the room. He turned on the light and saw something small that was ...
34	Sherhonda desperté emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que se ...	←	Sherhonda woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ...

35	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que se ...	←	He woke up, excited to hear a noise in the room and turned the light on to see the small figure that was ...
36	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que fue ... un gatito!	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ...a little cat!
37	Se despertó emocionada de oír un ruido en la habitación y encendió la luz para ver la pequea figura que se ...	←	He woke up excited to hear a noise in the room and turned on the light to see the small figure that was ...
38	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que fue	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was ....
39	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que fue ... Abuela! Ella estaba armado con su bastón, en busca de sus dientes y ya que era culpable de tomarlos ...	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was ... Grandma! She was armed with her cane, looking for her teeth and and who was guilty of taking them...
40	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que se ... Dccrcfvvfrrr	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ...Dccrcfvvfrrr
41	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que se baile ...	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ...Dancing
42	Se despertó emocionada de oír un ruido en la habitación. Encendió la luz para ver la pequea figura que se ...	←	He woke up excited to hear a noise in the room. He turned on the light to see the small figure that was ...
43	Se despertó emocionada de oír un ruido en la habitación y encendió la luz para ver una pequea figura que se ...	←	He woke up excited to hear a noise in the room, and turned on the light to see a small figure that was ...

44	Al oír un ruido en la habitación, se despertó excitado, y encendió la luz para ver una pequea figura que fue	←	Hearing a noise in the room, he woke up excited, and turned the light on to see a small figure that was.....
45	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que corría por el suelo.	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was running across the floor.
46	Se despertó emocionada de oír un ruido en la habitación y encendió la luz para ver la pequea figura que era ... su padre trabajando en el coche	←	He woke up excited to hear a noise in the room and turned on the light to see the small figure that was ... his dad working on the car
47	Se despertó, emocionado, al oír un ruido en la habitación y encendió la luz para ver la pequea figura que se ...	←	He woke up, excited, to hear a noise in the room, and turned on the light to see the small figure that was ...
48	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que fue ... Un fantasma aterrador gran	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was ...A great scary ghost
49	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que se ... Shameka y jade y Ellis todos vivieron felices para siempre	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ...shameka and jade and ellis all lived happily ever after
50	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz, sólo para ver una pequea figura que se ...	←	He woke up, excited to hear a noise in the room ,and turned on the light, only to see a small figure that was ...
51	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que estaba allí de pie, mirándole fijamente.	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was standing there, staring at him.
52	Se quedó dormido, pero despertó cuando oyó ruido en la habitación. Encendió la luz para ver una figura de enorme cornamenta que se ...	←	He fell asleep, but woke up when he heard noise in the room. He turned on the light to see a huge antlered figure that was ...

53	Se despertó, emocionado de escuchar un ruido en la habitación. Encendió la luz para ver la pequea figura que se ...	←	He woke up, excited to hear a noise in the room. He turned on the light to see the small figure that was ...
54	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura se ...	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure was ...
55	Se despertó emocionado, al oír un ruido en la habitación, encendió la luz para ver la pequea figura que se ...	←	He woke up excited, hearing a noise in the room, he turned on the light to see the small figure that was ...
56	Se despertó sobresaltado al oír un ruido en la habitación y encendió la luz para ver la pequea figura que se ...	←	He woke up, startled to hear a noise in the room and turned on the light to see the small figure that was ...
57	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura, que era ...	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure, it was ...
58	Esto aparece sin que yo hiciera nada. Por qué?	←	This thing pops up without my doing anything. Why?
59	Se despertó, entusiasmados con el entusiasmo de encontrar un ruido en la habitación y encendió la luz para ver a la pequea criatura que fue ...	←	He woke up, excited with enthusiasm to find a noise in the room and switched on the light to see the little creature that was ...
60	Se despertó, ansioso porque oyó un ruido en la habitación. Encendió la luz para ver la pequea figura que se ...	←	He woke up, anxious because he heard a noise in the room. He turned on the light to see the small figure that was ...
61	Se despertó temprano, él estaba muy emocionado al oír un ruido en la habitación y luego se encendió la luz para ver la pequea figura que se ...	←	He woke up early,he was very excited to hear a noise in the room and then he turned on the light to see the small figure that was ...
62	Se despertó porque escuchó un ruido en la habitación y encendió la luz para ver una pequea figura que se ...	←	He woke up because he heard a noise in the room and turned on the light to see a small figure that was ...

63	Se despertó, emocionado de escuchar un ruido en la habitación. Encendió la luz esperando que el ratón, pero encontró en su lugar	←	He woke up, excited to hear a noise in the room. He turned on the light expecting the mouse but instead found.....
64	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que fue un golden retriever grande.	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was a big golden retriever.
65	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que fue revelado para ser ...	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was revealed to be ...
66	Se despertó, asustado cuando oyó un ruido en la habitación y encendió la luz para ver una pequea figura que se ...	←	He woke up, frightened when he heard a noise in the room and turned on the light to see a small figure that was ...
67	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que se ...	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was...
68	Se despertó, emocionado de escuchar un ruido en la habitación. Encendió la luz para ver una pequea figura que resultó ser ...	←	He woke up, excited to hear a noise in the room. He turned on the light to see a small figure that turned out to be ...
69	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que era un nio pequeo	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was a small kid
70	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que se ... pequeas y se ve muy difícil	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was ... Small and looks really awkward
71	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que era pequea y extraa realidad	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was small and really weird

72	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que era ... aterrador.	←	He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was ... scary.
73	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que fue un pequeo ratón que se veía muy uncofortable	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was a small mouse that looked really uncofortable
74	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver la pequea figura que era sólo una hoja.	←	He woke up, excited to hear a noise in the room and turned on the light to see the small figure that was Just a leaf.
75	Se despertó sobresaltado al oír un ruido en la habitación. Encendió la luz para ver la pequea figura que se ...	←	He woke up, startled to hear a noise in the room. He turned on the light to see the small figure that was ...
76	El despertar de repente, se sintió complacido al escuchar un sonido, encender la luz, una pequea figura era visible	←	Waking up suddenly, he was pleased to hear a sound; turning on the light, a small figure was visible
77	Se despertó y encendió la luz para ver una pequea figura que se ... emocionado de escuchar un ruido en la habitación	←	He woke up, and turned on the light to see a small figure that was ...excited to hear a noise in the room
78	Se despertó, emocionado de escuchar un ruido en la habitación y encendió la luz para ver una pequea figura que se ...	←	He woke up, excited to hear a noise in the room; and turned on the light to see a small figure that was ...
79	Se despertó emocionada de oír un ruido en la habitación y encendió la luz para ver la pequea figura que fue ..... como un extraterrestre	←	He woke up excited to hear a noise in the room and turned on the light to see the small figure that was .....like an alien
Final Translation: He woke up, excited to hear a noise in the room and turned on the light to see a small figure that was ...			

Table A.19: Translation Data Collected with MonoTrans Widgets, sentence 1 on page 20.

#	**Spanish (source)**		**English (target)**

Original	La abuela! armada con su bastón, buscando sus dientes y al culpable de la travesura.		
	La abuela! armada con su bastón, buscando sus dientes y al culpable de la travesura.	→	Grandma! Armed with her cane, looking for his teeth and guilty of mischief. (machine translation)
1	Abuela! Armado con su bastón, en busca de sus dientes y culpable de la travesura.	←	Grandma! Armed with her cane, looking for his teeth and guilty of mischief.
2	Abuela! Ella estaba armado con su bastón, en busca de los dientes.	←	Grandma! She was armed with her cane, looking for her teeth.
3	Abuela! Ella estaba armado con su bastón, en busca de sus dientes, y culpable de la travesura.	←	Grandma! She was armed with her cane, looking for his teeth, and guilty of mischief.
4	Abuela! Ella estaba armado con su bastón, en busca de sus dientes y culpable de la travesura.	←	Grandma! She was armed with her cane, looking for his teeth and guilty of mischief.
5	Abuela! Ella estaba armado con su bastón, en busca de sus dientes, y sospechoso de dao.	←	Grandma! She was armed with her cane, looking for her teeth, and suspicious of mischief.
6	Abuela! Armado con su bastón, en busca de sus dientes y culpable de la travesura.	→	Grandma! Armed with his cane, looking for his teeth and guilty of mischief.
7	Abuela! Armado con su bastón, que estaba buscando para sus dientes y culpable de la travesura.	←	Grandma! Armed with her cane, she was looking for his teeth and guilty of mischief.
8	Abuela! Armado con su bastón, en busca de sus dientes y culpable de la travesura.	←	Grandma! Armed with her cane, looking for her teeth and guilty of mischief.
9	Abuela! Armado con su bastón, que estaba en busca de los dientes y miró culpable de la travesura.	←	Grandma! Armed with her cane, she was searching for her teeth and looked guilty of mischief.
10	Abuela! Ella estaba armado con su bastón, en busca de sus dientes y culpable de la travesura.	←	Grandma! She was armed with her cane, looking for her teeth and guilty of mischief.
11	Abuela! Armado con su bastón, que estaba en busca de su diente y culpable de la travesura.	←	Grandma! Armed with her cane, she was looking for his tooth and guilty of mischief.
12	Abuela, armado con su bastón, fue en busca de sus dientes y culpable de la travesura.	←	Grandma, armed with her cane, was looking for his teeth and guilty of mischief.

13	La abuela Armados con su bastón, que estaba buscando para sus dientes, y culpable de la travesura.	←	Grandma! Armed with her cane, she was looking for his teeth, and guilty of mischief.
14	Armado con su bastón, la abuela parecía culpable de la travesura en la búsqueda de sus dientes.	←	Armed with her cane, grandma looked guilty of mischief while looking for her teeth.
15	Abuela! Armado con su bastón, que estaba buscando sus dientes y que era culpable de la travesura.	←	Grandma! Armed with her cane, she was looking for her teeth and he was guilty of mischief.
16	Abuela! Ella estaba armado con su bastón y en busca de su diente, buscando culpables de la travesura.	←	Grandma! She was armed with her cane and looking for his tooth, looking guilty of mischief.
17	Abuela! Armado con su bastón, que estaba buscando sus dientes y culpable de la travesura.	←	Grandma! Armed with her cane, she was looking for her teeth and guilty of mischief.
18	Abuela! Armado con su bastón, en busca de sus dientes, era culpable de la travesura.	←	Grandma! Armed with her cane, looking for her teeth, he was guilty of mischief.
19	Abuela! Armado con su bastón, en busca de sus dientes, y culpable de la travesura.	←	Grandma! Armed with her cane, looking for her teeth, and guilty of mischief.
20	Su cocina, olorosa una miel de caa y lena seca	←	Su cocina, olorosa a miel de cana y lena seca
21	Abuela! Armado con su bastón, que estaba buscando para sus dientes y supo que era culpable de la travesura.	←	Grandma! Armed with her cane, she was looking for his teeth and knew he was guilty of mischief.
22	Abuela! Armado con su bastón, en busca de los dientes. l era culpable de la travesura.	←	Grandma! Armed with her cane, looking for her teeth. He was guilty of mischief.
23	Abuela! Armado con su bastón, fue en busca de sus dientes y culpable de la travesura.	←	Grandma! Armed with her cane, was looking for her teeth and guilty of mischief.
24	Abuela Armados con su bastón, que estaba buscando sus dientes y culpable de la travesura.	←	Grandma Armed with her cane, she was looking for her teeth and guilty of mischief.
25	Abuela! Armado con su bastón, que profesaban ser en busca de sus dientes, y sin embargo parecía culpable de la travesura.	←	Grandma! Armed with her cane, she professed to be looking for her teeth, and yet seemed guilty of mischief.

26	Abuela, armado con su bastón, que estaba buscando para sus dientes y culpable de la travesura.	←	Grandma, armed with her cane, she was looking for his teeth and guilty of mischief.
27	Abuela! Bastón en la mano, ella buscó para los dientes y parecía culpable.	←	Grandmother! Cane in hand, she searched for his teeth and looked guilty.
28	Abuela! Armado con su bastón, en busca de sus dientes y sospechosos de malicia.	←	Grandma! Armed with her cane, looking for her teeth and suspicious of mischief.
29	Abuela! Armado con su bastón, en busca de sus dientes y culpable de la travesura.	←	Grandma! Armed with her cane, looking for her teeth and guilty of mischief.
30	Abuela! Armado con su bastón y culpable de la travesura, que estaba buscando para sus dientes.	←	Grandma! Armed with her cane and guilty of mischief, she was looking for his teeth.
31	Abuela!, Usted está aquí!, Puedo cocinar un bollo o tal vez un poco de té?	←	Grandma!,You are here!,May I cook you a scone or maybe some tea?
32	Abuela, armado con su bastón y culpable de la travesura, fue en busca de los dientes.	←	Grandma, armed with her cane and guilty of mischief, was looking for her teeth.
33	La abuela estaba armado con su bastón. Estaba buscando sus dientes y culpable de la travesura.	←	Grandma was armed with her cane. She was looking for his teeth and guilty of mischief.
34	Abuela! Armado con su mono, que estaba buscando para sus dientes y culpable de la travesura.	←	Grandma! Armed with her monkey, she was looking for his teeth and guilty of mischief.
35	Abuela! Armado con su bastón, que estaba buscando sus dientes y sospechosos de malicia.	←	Grandma! Armed with her cane, she was looking for her teeth and suspicious of mischief.
36	Abuela! Armado con su bastón, que estaba buscando para sus dientes y un culpable de la travesura.	←	Grandma! Armed with her cane, she was looking for his teeth and A guilty of mischief.
37	Abuela! Armado con el bastón, que estaba buscando para sus dientes y culpable de la travesura.	←	Grandma! Armed with the cane, she was looking for his teeth and guilty of mischief.
38	La abuela estaba armado con su bastón, en busca de sus dientes, y culpable de la travesura.	←	Grandma was armed with her cane, looking for her teeth, and guilty of mischief.

39	Abuela! Armado con su bastón estaba buscando sus dientes. Ahh, se sentía culpable de la travesura.	←	Grandma! Armed with her cane was looking for her teeth. Ahh, he felt guilty of mischief.
40	Abuela! Armado con su bastón, en busca de sus dientes y el culpable de la travesura	←	Grandma! Armed with her cane, looking for her teeth and the one guilty of mischief
41	La abuela estaba armado con su bastón, en busca de sus dientes y culpable de la travesura.	←	Grandma was armed with her cane, looking for her teeth and guilty of mischief.
42	Abuela! Armado con su bastón, que estaba buscando sus dientes y sospechando mal.	←	Grandma! Armed with her cane, she was looking for her teeth and suspecting mischief.
43	Abuela! Armado con su bastón, en busca de sus dientes y el que era culpable de la travesura.	←	Grandma! Armed with her cane, looking for her teeth and the one that was guilty of mischief.
44	Marina de la abuela con su bastón, en busca de sus dientes y culpable de la travesura.	→	Navy Grandma with his cane, looking for their teeth and guilty of mischief.
45	Papá por favor no te vayas	←	Daddy please don't go
46	Marina de la abuela con su bastón estaba buscando los dientes y culpable de la travesura.	←	Navy Grandma with her cane was looking for teeth and guilty of mischief.
47	Marina de la abuela con su bastón, en busca de los dientes, y culpable de la travesura.	←	Navy Grandma with her cane, looking for teeth, and guilty of mischief.
48	Marina de la abuela con su bastón, fue en busca de los dientes y culpable de la travesura.	←	Navy Grandma with her cane, was looking for teeth and guilty of mischief.
49	Marina de la abuela con su bastón, en busca de los dientes y culpable de la travesura.	←	Navy Grandma with her cane, looking for teeth and guilty of mischief.
50	Marina de la abuela con su bastón, en busca de los dientes y culpable de la travesura.	←	Navy Grandma with her cane, looking for teeth and guilty of mischief.
51	La abuela con su bastón, en busca de sus dientes y alguien culpable de la travesura.	←	Grandma with her cane, looking for her teeth and someone guilty of mischief.
52	Marina de la abuela estaba en la puerta con su bastón, en busca de los dientes y la sensación travieso.	←	Navy Grandma stood at the door with her cane, looking for teeth and feeling mischievious.

53	Marina de la abuela en busca de los dientes y culpable de la travesura.	←	Navy Grandma looking for teeth and guilty of mischief.
54	Marina de la abuela con su bastón, fue en busca de sus dientes y culpable de la travesura.	←	Navy Grandma with her cane, was looking for her teeth and guilty of mischief.
55	Marina de la abuela con su bastón, en busca de sus dientes y culpable de la travesura.	←	Navy Grandma with her cane, looking for her teeth and guilty of mischief.
56	A su abuela con su bastón, en busca de su dentadura y el culpable de la travesura uno.	←	his Grandma with her cane, looking for her dentures and the one guilty of mischief.
57	La abuela con su bastón, en busca de su dentadura y el que era culpable de la travesura.	←	Grandma with her cane, looking for her dentures and the one that was guilty of mischief.
58	Fue la abuela con su bastón, en busca de su dentadura y el culpable de la travesura.	←	It was Grandma with her cane, looking for her dentures and the one guilty of mischief.
59	Marina de la abuela estaba buscando los dientes con ella y culpable de la travesura.	←	Navy Grandma was looking for teeth with her and guilty of mischief.
60	Su abuela con su bastón, en busca de su dentadura y el culpable de la travesura uno.	←	His grandma with her cane, looking for her dentures and the one guilty of mischief.
61	Marina de la abuela con su bastón, en busca de los dientes y ella era culpable de la travesura.	←	Navy Grandma with her cane, looking for teeth and she was guilty of mischief.
62	Marina de la abuela con su bastón está buscando para los dientes y culpable de la travesura.	←	Navy Grandma with her cane is looking for teeth and guilty of mischief.
63	Marina de la abuela, culpable de la travesura, en busca de los dientes con su bastón.	←	Navy Grandma, guilty of mischief, looking for teeth with her cane.
64	Marina de la abuela con su bastón, en busca de su dentadura y culpable de la travesura.	←	Navy Grandma with her cane, looking for her dentures and guilty of mischief.
65	Abuela! Con su bastón, en busca de sus dientes y el que jugó la broma también.	→	Grandma! With Her stick, looking for her teeth and the one Who played the prank too.
66	"Abuela! Con su bastón, en busca de sus dientes y el que jugó la broma demasiado"	←	"Grandma! With Her stick, looking for her teeth and the one Who played the prank too"

67	Abuela! Se puso de pie con su bastón, en busca de los dientes y dispuestos a encontrar el culpable de la reproducción de la broma.	←	Grandma! She stood with her stick, looking for her teeth and ready to find the the one guilty of playing the prank.
68	"Abuela con su bastón, en busca de sus dientes y el que jugó la broma demasiado"	←	"Grandma with her stick, looking for her teeth and the one who played the prank too"
69	"Abuela! Ocupó su bastón y sus dientes. Buscaba el que jugó la broma, también."	←	"Grandma! she held her walking stick and her teeth. She was looking for the one who played the prank, too."
70	"Abuela entró en la habitación, caminando con su bastón. Estaba buscando sus dientes y el que jugó la broma demasiado"	←	"Grandma entered the room, walking with her cane. She was looking for her teeth and the one who played the prank too"
71	"Abuela! Con su bastón, en busca de los dientes (y el que jugó la broma también)"	←	"Grandma! With her stick, looking for her teeth (and the one who played the prank too)"
72	"Abuela! Manteniendo su bastón en la búsqueda de sus dientes y el bromista demasiado"	←	"Grandma! Holding Her stick while looking for her teeth and the prankster too"
73	La abuela", Con su bastón, en busca de sus dientes y el que jugó la broma.	←	"Grandma! With her stick, looking for her teeth and whoever played the prank.
74	"Abuela! Con su bastón, en busca de sus dientes y el que jugó la broma demasiado"	←	"Grandma! With her stick, looking for her teeth and the one who played the prank too"
75	"La abuela, con su bastón, fue a buscar a sus dientes, así como el que había jugado la broma"	←	"Grandma, with her stick, went looking for her teeth as well as the one who had played the prank"
76	"La abuela está buscando para el que jugó la broma con sus dientes y su bastón, también!"	←	"Grandma is looking for the one Who played the prank With her teeth and Her stick, too! "
77	"La abuela, con su bastón, en busca de sus dientes, y el que jugó la broma demasiado"	←	"Grandma, with her stick, looking for her teeth, and the one who played the prank too"
Final Translation: "Grandma! With Her stick, looking for her teeth and the one Who played the prank too"			

Table A.20: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 22.

#	**Spanish (source)**		**English (target)**

Original	Resignado, sacó del bolsillo su verdadero y brillante diente, lo colocó debajo de la almohada y dejó al pie de la cama un platito con una rebanada de queso a manera de disculpas.		
	Resignado, sacó del bolsillo su verdadero y brillante diente, lo colocó debajo de la almohada y dejó al pie de la cama un platito con una rebanada de queso a manera de disculpas.	→	Resigned, he took out his true and bright teeth, placed it under his pillow and left the foot of the bed a plate with a slice of cheese by way of apology. (machine translation)
1	Renunció, sacó dientes verdadera y brillante, colocó bajo su almohada y izquierda pie del cama un plato con una rebanada de queso como disculpa.	←	Resigned, he took out his true and bright teeth, placed it under his pillow and left the foot of the bed a plate with a slice of cheese by way of apology.
2	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue a los pies de la cama un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left at the foot of the bed a plate with a slice of cheese by way of apology.
3	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue al pie de la cama un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left the foot of the bed a plate with a slice of cheese by way of apology.
4	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada, y se fue a los pies de la cama un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow, and left at the foot of the bed a plate with a slice of cheese by way of apology.
5	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y dejó un plato de queso a los pies de la cama como una disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left a plate of cheese by the foot of the bed as an apology.

6	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada, y dejó un plato con una rebanada de queso a los pies de la cama a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow, and left a plate with a slice of cheese at the foot of the bed by way of apology.
7	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y lo dejó a los pies de la cama con una rodaja de queso en un plato como una disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left it at the foot of the bed with a slice of cheese on a plate as an apology.
8	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y la izquierda, a los pies de la cama, un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left, at the foot of the bed, a plate with a slice of cheese by way of apology.
9	ResigCffffned, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue al pie de la cama un plato con una rebanada de queso a modo de disculpa.	←	ResigCffffned, he took out his true and bright tooth, placed it under his pillow and left the foot of the bed a plate with a slice of cheese by way of apology.
10	Con resignado ESA Verdad tomo Su diente y he aquí Coloco Bajo la almohada y dejo sin plato con queso una pasteles los de la cama de como asesinatos de Su arrepentimiento.	←	Resignado con esa verdad tomo su diente y lo coloco bajo la almohada y dejo un plato con queso a los pies de la cama como murders de su arrepentimiento.
11	Resignado, sacó un diente real y brillantes y lo colocó bajo la almohada. A modo de disculpa, que dejó un plato con una rebanada de queso a los pies de la cama.	←	Resigned, he took out his true and bright tooth and placed it under his pillow. By way of apology, he left a plate with a slice of cheese at the foot of the bed.
12	MDSF	←	mdsf
13	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada, y luego a la izquierda un plato con una rebanada de queso a los pies de la cama a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow, and then left a plate with a slice of cheese at the foot of the bed by way of apology.

14	Resignado, sacó los dientes brillantes cierto, lo colocó debajo de su almohada, y dejó un plato de queso a los pies de la cama como una disculpa.	←	Resigned, he took out his true bright tooth, placed it under his pillow, and left a plate of cheese by the foot of the bed as an apology.
15	Resignado, sacó los dientes nacarados real, lo colocó debajo de su almohada y lo dejó a los pies de la cama con un plato y una rebanada de queso como una disculpa.	←	Resigned, he took out his real pearly tooth, placed it under his pillow and left it at the foot of the bed with a plate and slice of cheese as an apology.
16	Resignado, sacó los dientes, lo colocó debajo de su almohada, y dejó un plato con una rebanada de queso a los pies de la cama como una forma de disculpa.	←	Resigned, he took out his tooth, placed it under his pillow, and left a plate with a slice of cheese at the foot of the bed as a means of apology.
17	Resignado, sacó un diente real, brillantes, lo colocó debajo de su almohada y dejó un plato con una rebanada de queso a los pies de la cama a modo de disculpa.	←	Resigned, he took out his real, shiny tooth, placed it under his pillow and left a plate with a slice of cheese at the foot of the bed by way of apology.
18	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y lo dejó a los pies de la cama con una rebanada de queso en un plato como una disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left it at the foot of the bed with a slice of cheese on a saucer as an apology.
19	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue a los pies de la cama un plato con una rebanada de queso. Esta fue su manera de pedir perdón	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left at the foot of the bed a plate with a slice of cheese. This was his way of apologizing
20	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada, y al pie de la cama a la izquierda un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow, and at the foot of the bed left a plate with a slice of cheese by way of apology.

21	Resignado, sacó un diente real y brillante, la colocó bajo su almohada y, a modo de disculpa, a la izquierda un plato con una rebanada de queso a los pies de la cama.	←	Resigned, he took out his real and bright tooth, placed it under his pillow and, by way of apology, left a plate with a slice of cheese at the foot of the bed.
22	l puso su propio diente bajo la almohada y un plato con queso, debajo de la cama, como una manera de decir que lo sentía ..	←	He put his own tooth under his pillow and a plate with cheese, under the bed, as a way of saying he was sorry..
23	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue al pie de la cama un plato con una rebanada de queso para apalagas.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left the foot of the bed a plate with a slice of cheese to apalagas.
24	Avergonzado, sacó un diente, lo colocó debajo de su almohada y dejó un plato de queso a los pies de la cama como una disculpa.	←	Embarrassed, he took out his tooth, placed it under his pillow and left a plate of cheese by the foot of the bed as an apology.
25	Dado por vencido, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue al pie de la cama un plato con una rebanada de queso a modo de disculpa.	←	Given up, he took out his true and bright tooth, placed it under his pillow and left the foot of the bed a plate with a slice of cheese by way of apology.
26	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue a los pies de la cama un plato con una rebanada de queso como una disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left at the foot of the bed a plate with a slice of cheese as an apology.
27	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y dejó un plato con una rebanada de queso al pie de la cama como una disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left a plate with a slice of cheese the foot of the bed as an apology.
28	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y dejó un plato con una rebanada de queso a los pies de la cama, en un intento de hacer una disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left a plate with a slice of cheese at the foot of the bed in an attempt at making an apology.

29	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada, y se fue a los pies de la cama un plato con una rebanada de queso a modo de disculpa.	←	Resigned he took out his true and bright tooth, placed it under his pillow, and left at the foot of the bed a plate with a slice of cheese by way of apology.
30	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y dejó un plato con una rebanada de queso a los pies de la cama a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left a plate with a slice of cheese at the foot of the bed by way of apology.
31	Resignado, sacó un diente verdadero y brillante, y lo puso bajo su pilow.At los pies de la cama, salió de una rebanada de queso en un plato como un gesto de disculpa.	←	Resigned, he took out his true and bright tooth and, placed it under his pilow.At the foot of the bed ,he left a slice of cheese on a plate as a gesture of apology.
32	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y lo dejó a los pies de la cama con un plato y una rodaja de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left it at the foot of the bed with a plate and a slice of cheese by way of apology.
33	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue al pie de la cama con un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left the foot of the bed with a plate with a slice of cheese by way of apology.
34	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada, y se fue a los pies de la cama un plato con una rebanada de queso, a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow, and left at the foot of the bed a plate with a slice of cheese, by way of apology.
35	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada, y dejó un plato de queso a los pies de la cama como una disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow, and left a plate of cheese by the foot of the bed as an apology.

36	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue a los pies de la cama un plato con una rebanada de queso, a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left at the foot of the bed a plate with a slice of cheese, by way of apology.
37	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue a la cama un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left by the bed a plate with a slice of cheese by way of apology.
38	Resignado, sacó un diente real y brillante, la colocó bajo su almohada y dejó un plato de queso a los pies de la cama como una disculpa.	←	Resigned, he took out his real and bright tooth, placed it under his pillow and left a plate of cheese by the foot of the bed as an apology.
39	Para el hosco Fairey diente vendrá, dijo Alyssa Con una sonrisa esperanzada brillante con un diente salido, espero que me sale un qauter una, dijo con otra sonrisa que tenía la esperanza suficiente.	←	For surley the tooth fairey will comeSaid Alyssa With A Hopeful bright smile with one tooth gone,I hope i get a a qauter,She said with another smile that was hopeful enough.
40	Sacó su diente blanco bastante en lo colocó debajo de su almohada y dejó una plataforma de queso a los pies de la cama apolgy	←	He took out his pretty white tooth in placed it under his pillow and left a plat of string cheese at the foot of the bed apolgy
41	Resignado, sacó los dientes brillantes, lo colocó debajo de su almohada, y dejó un plato con una rebanada de queso a los pies de la cama a modo de disculpa.	←	Resigned, he took out his shiny tooth, placed it under his pillow, and left a plate with a slice of cheese at the foot of the bed by way of apology.
42	Resignado, sacó su propia dientes brillantes, lo colocó debajo de su almohada y dejó un plato con una rebanada de queso a los pies de la cama a modo de disculpa.	←	Resigned, he took out his own shiny tooth, placed it under his pillow and left a plate with a slice of cheese at the foot of the bed by way of apology.
43	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada, y se fue a los pies de la cama, un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow, and left at the foot of the bed, a plate with a slice of cheese by way of apology.

44	Resignado, sacó su propia dientes brillantes, lo colocó debajo de su almohada y se fue a los pies de la cama un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his own shiny tooth, placed it under his pillow and left at the foot of the bed a plate with a slice of cheese by way of apology.
45	por qué lo kjnsekjfrnebkjanshai-jknswaYGTSAFUSWHhyuwtyq	←	why you so kjnsekjfrnebkjanshai-jknswaYGTSAFUSWHhyuwtyq
46	Resignado, sacó su propia dientes brillantes, lo colocó debajo de su almohada y dejó un plato de queso a los pies de la cama como una disculpa.	←	Resigned, he took out his own shiny tooth, placed it under his pillow and left a plate of cheese by the foot of the bed as an apology.
47	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue al pie de la cama un plato con una rebanada de queso como una disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left the foot of the bed a plate with a slice of cheese as an apology.
48	Resignado, sacó un diente real, lo colocó debajo de su almohada, y dejó un plato de queso a los pies de la cama como una disculpa.	←	Resigned, he took out his real tooth, placed it under his pillow, and left a plate of cheese by the foot of the bed as an apology.
49	Resignado, sacó su propia dientes brillantes, lo colocó debajo de su almohada y dejó un plato con una rebanada de queso a los pies de la cama, a modo de disculpa.	←	Resigned, he took out his own shiny tooth, placed it under his pillow and left a plate with a slice of cheese at the foot of the bed, by way of apology.
50	Resignado, sacó su propia dientes brillantes, lo colocó debajo de su almohada y dejó un plato de queso a los pies de la cama como una disculpa.	←	Resigned, he took out his own shiny tooth, placed it under his pillow and left a plate of cheese by the foot of the bed as an apology.
51	Resignado, sacó su propia dientes brillantes, lo colocó debajo de su almohada y se fue a los pies de la cama un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his own bright tooth, placed it under his pillow and left at the foot of the bed a plate with a slice of cheese by way of apology.
52	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y dejó un plato con una rebanada de queso en el pie de su cama a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left a plate with a slice of cheese on the foot of his bed by way of apology.

53	Resignado, sacó un diente real y brillante, la colocó bajo su almohada y se fue al lado del pie de la cama un plato con una rebanada de queso para un modo de disculpa.	←	Resigned, he took out his real and bright tooth, placed it under his pillow and left beside the foot of the bed a plate with a slice of cheese for a way of apology.
54	Resignado, sacó un diente real, brillantes, lo colocó debajo de su almohada, y dejó una rebanada de queso en un plato a los pies de la cama como una disculpa.	←	Resigned, he took out his real, bright tooth, placed it under his pillow, and left a slice of cheese on a plate at the foot of the bed as an apology.
55	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue a los pies de la cama, un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left at the foot of the bed, a plate with a slice of cheese by way of apology.
56	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y lo dejó y un plato con una rebanada de queso a los pies de su cama, por la forma de hacer su apología.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left it and a plate with a slice of cheese at the foot of his bed, by way of making his apology.
57	Resignado, tomó su propio diente, lo colocó debajo de su almohada y dejó un plato con una rebanada de queso a los pies de la cama como una disculpa a la abuela.	←	Resigned, he took out his own tooth, placed it under his pillow and left a plate with a slice of cheese at the foot of the bed as an apology to Grandma.
58	Resignado, sacó un diente verdadero y brillante, la colocó bajo su almohada y se fue a los pies de la cama, un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and left at the foot of the bed, a plate with a slice of cheese by way of apology.
59	Dado por vencido, sacó un diente verdadero y brillante, la colocó bajo su almohada y dejó un plato de queso a los pies de la cama como una disculpa.	←	Given up, he took out his true and bright tooth, placed it under his pillow and left a plate of cheese by the foot of the bed as an apology.

60	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada y por los pies de la cama a la izquierda un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and by the foot of the bed left a plate with a slice of cheese by way of apology.
61	Con algunos Aletas	←	algunos con aletas
62	Resignado, sacó un diente verdadero y brillante, lo colocó debajo de su almohada y al pie del lugar de la cama un plato con una rebanada de queso a modo de disculpa.	←	Resigned, he took out his true and bright tooth, placed it under his pillow and at the foot of the bed place a plate with a slice of cheese by way of apology.
63	Resignado, sacó un diente brillante, real, lo colocó debajo de su almohada y le dejó un plato de queso a los pies de la cama como una disculpa.	←	Resigned, he took out his bright, real tooth, placed it under his pillow and left a plate of cheese by the foot of the bed as an apology.
64	Resignado, sacó un diente brillante, lo colocó debajo de su almohada y le dejó un plato de queso a los pies de la cama como una disculpa.	←	Resigned, he took out his bright tooth, placed it under his pillow and left a plate of cheese by the foot of the bed as an apology.
65	Sacó su diente verdadero y brillante, lo colocó debajo de su almohada, y dejó un trozo de queso en un plato, al pie de su cama como una disculpa.	←	He took out his true and bright tooth, placed it under his pillow, and left a slice of cheese on a plate at the foot of his bed as an apology.
66	Resignado, tomó un diente real y brillante, lo colocó debajo de su almohada y se coloca a los pies de la cama un plato con una rebanada de queso a modo de disculpa.	→	Resigned, he took a real tooth and bright, placed it under his pillow and placed at the foot of the bed a plate with a slice of cheese by way of apology.
67	Diente renunció reales sacó un brillante, lo colocó debajo de su almohada y se coloca a los pies de la cama un plato con una rebanada de queso a modo de disculpa.	→	Resigned real tooth pulled out a shiny, placed it under his pillow and placed at the foot of the bed a plate with a slice of cheese by way of apology.

68	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y puso un plato de queso en el pie de su cama a modo de disculpa.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and laid a plate of cheese on the foot of his bed by way of an apology.
69	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y se coloca un plato de queso en el pie de su cama a modo de disculpa.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and placed a plate of cheese on the foot of his bed by way of an apology.
70	Resignado, tomó su diente real, brillantes y lo colocó bajo la almohada. Puso un plato de queso en el pie de su cama, a modo de disculpa.	←	Resigned, he took his real, bright tooth and placed it under his pillow. He put a plate of cheese on the foot of his bed, by way of apology.
71	tomó su diente real, brillantes, lo colocó debajo de su almohada, y se coloca un plato de queso en el pie de su cama a modo de disculpa.	←	took his real, bright tooth, placed it under his pillow, and placed a plate of cheese on the foot of his bed by way of an apology.
72	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y puso un plato de queso a los pies de su cama como una disculpa.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and laid a plate of cheese at the foot of his bed as an apology.
73	Resignado, tomó su brillante diente real, lo colocó debajo de su almohada, y se coloca un plato de queso en el pie de su cama a modo de disculpa.	←	Resigned, he took his real bright tooth, placed it under his pillow, and placed a plate of cheese on the foot of his bed by way of an apology.
74	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y se coloca un plato de queso en el pie de su cama como una manera de pedir perdón.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and placed a plate of cheese on the foot of his bed as a way of apologizing.
75	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y puso un plato de queso en el pie de su cama como una disculpa.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and laid a plate of cheese on the foot of his bed as an apology.

76	Resignado, tomó su brillante diente real, se pone debajo de su almohada, y se coloca un plato de queso en el pie de su cama a modo de disculpa.	←	Resigned, he took his real bright tooth, put it under his pillow, and placed a plate of cheese on the foot of his bed by way of an apology.
77	Resignado, tomó su brillante diente real, lo colocó debajo de su almohada y se coloca un plato de queso en el pie de su cama a modo de disculpa.	←	Resigned, he took his real bright tooth, placed it under his pillow and placed a plate of cheese on the foot of his bed by way of an apology.
78	l puso su diente bajo la almohada y poner un plato de queso a los pies de su cama como una disculpa.	←	He placed his tooth under his pillow and put a plate of cheese at the foot of his bed as an apology.
79	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y se coloca un plato de queso en el extremo inferior de su cama como una disculpa.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and placed a plate of cheese at the bottom end of his bed as an apology.
80	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y puso un plato de queso en el extremo inferior de su cama como una disculpa.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and laid a plate of cheese at the bottom end of his bed as an apology.
81	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y se coloca un plato de queso a los pies de su cama como una disculpa.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and placed a plate of cheese at the foot of his bed as an apology.
82	Resignado, tomó su diente real, brillantes y lo colocó debajo de su almohada, luego se coloca un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his real, bright tooth and placed it under his pillow, then he placed a plate of cheese at the foot of his bed by way of an apology.
83	Resignado, tomó su diente real, brillantes y se pone debajo de su almohada, y se coloca un plato de queso en el pie de su cama a modo de disculpa.	←	Resigned, he took his real, bright tooth, put it under his pillow, and placed a plate of cheese on the foot of his bed by way of an apology.

84	Resignado, tomó su brillante diente real, lo colocó debajo de su almohada, y puso un plato de queso en el pie de su cama a modo de disculpa.	←	Resigned, he took his real bright tooth, placed it under his pillow, and laid a plate of cheese on the foot of his bed by way of an apology.
85	Resignado, tomó su diente real, brillantes y se pone debajo de su almohada, y se coloca un plato de queso en el pie de su cama a modo de disculpa.	←	Resigned, he took his real, bright tooth and put it under his pillow, and placed a plate of cheese on the foot of his bed by way of an apology.
86	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y puso un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and laid a plate of cheese at the foot of his bed by way of an apology.
87	Resignado, tomó su diente real, lo colocó debajo de su almohada, y puso un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his real tooth, placed it under his pillow, and laid a plate of cheese at the foot of his bed by way of an apology.
88	Resignado, tomó su diente real, brillantes, lo colocó debajo de su almohada, y puso de un queso en la placa de un pie de su cama, un a modo de disculpa.	←	Resigned, he took his real, bright tooth, placed it under his pillow, and laid of a cheese on the plate an a foot of his bed by way of apology.
89	Resignado, tomó su brillante diente real, lo colocó debajo de su almohada, y se coloca un plato de queso en el pie de su cama, a modo de disculpa.	←	Resigned, he took his real bright tooth, placed it under his pillow, and placed a plate of cheese on the foot of his bed, by way of an apology.
90	Resignado, tomó su fuerza real y brillante. Colocado debajo de su almohada, y se coloca un plato de queso a los pies de su cama a modo de disculpa.	→	Resigned, he took his real teeth and shiny. Placed it under his pillow, and placed a plate of cheese at the foot of his bed by way of apology.
91	Resignado, tomó su fuerza real, brillantes y lo colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his real, shiny teeth and placed it under his pillow. Then he placed a plate of cheese at the foot of his bed by way of apology.

92	Resignado, tomó su diente real, brillantes y lo colocó bajo la almohada. Luego, se coloca un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his real, shiny tooth and placed it under his pillow. Then, he placed a plate of cheese at the foot of his bed by way of apology.
93	Sensación renunció, tomó su diente real, brillantes y lo colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama a modo de disculpa.	←	Feeling resigned, he took his real, shiny tooth and placed it under his pillow. Then he placed a plate of cheese at the foot of his bed by way of apology.
94	Resignado, tomó su diente real, brillantes y lo colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his real, shiny tooth and placed it under his pillow. Then he placed a plate of cheese at the foot of his bed by way of apology.
95	Resignado, tomó su fuerza real, brillantes y los colocó bajo la almohada. Luego se puso un plato de queso a los pies de su cama para servir como una disculpa.	←	Resigned, he took his real, shiny teeth and placed them under his pillow. Then he set a plate of cheese at the foot of his bed to serve as an apology.
96	Resignado, tomó su brillante diente y lo colocó bajo la almohada. Luego, se coloca un plato de queso a los pies de su cama como una disculpa.	←	Resigned, he took his shiny tooth and placed it under his pillow. Then, he placed a plate of cheese at the foot of his bed as an apology.
97	Resignado, tomó el diente brillante que había perdido y lo colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama como una disculpa.	←	Resigned, he took the shiny tooth he had lost and placed it under his pillow. Then he placed a plate of cheese at the foot of his bed as an apology.
98	Resignado, tomó su fuerza real, brillantes y los colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his real, shiny teeth and placed them under his pillow. Then he placed a plate of cheese at the foot of his bed by way of apology.
99	Resignado, tomó su diente real, brillantes y lo colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his real, shiny tooth and placed it under his pillow. He then placed a plate of cheese at the foot of his bed by way of apology.
100	Eso no es un conejo	←	that's not a rabbit

101	Resignado, tomó su fuerza real, brillantes y los colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama como una disculpa.	←	Resigned, he took his real, shiny teeth and placed them under his pillow. Then he placed a plate of cheese at the foot of his bed as an apology.
102	Resignado, tomó su brillante diente real y lo colocó bajo la almohada. Luego, se coloca un plato de queso a los pies de su cama, su manera de disculpa.	←	Resigned, he took his real shiny tooth and placed it under his pillow. Then, he placed a plate of cheese at the foot of his bed, his way to apology.
103	Resignado, tomó su diente muy brillante y lo colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his very shiny tooth and placed it under his pillow. Then he placed a plate of cheese at the foot of his bed by way of apology.
104	Resignado, tomó su diente real, brillantes y lo colocó bajo la almohada. Luego, se coloca un plato de queso a los pies de su cama como disculpa.	←	Resigned, he took his real, shiny tooth and placed it under his pillow. Then, he placed a plate of cheese at the foot of his bed as apology.
105	Resignado, tomó su diente real, brillantes y lo colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama como su manera de disculpa.	←	Resigned, he took his real, shiny tooth and placed it under his pillow. Then he placed a plate of cheese at the foot of his bed as his way of apology.
106	Resignado, tomó su diente real, brillantes y lo colocó bajo la almohada. Luego puso un plato de queso a los pies de su cama, como una disculpa.	←	Resigned, he took his real, shiny tooth and placed it under his pillow. Then he placed a plate of cheese at the foot of his bed, as an apology.
107	Resignado, tomó su diente real, brillantes y lo colocó bajo la almohada. Luego, se coloca un plato de queso a los pies de su cama como una disculpa.	←	Resigned, he took his real, shiny tooth and placed it under his pillow. Then, he placed a plate of cheese at the foot of his bed as an apology.
108	Resignado, tomó su diente real, brillantes y se pone debajo de la almohada. A modo de disculpa puso un plato de queso a los pies de su cama.	←	Resigned, he took his real, shiny tooth and put it under his pillow. By way of apology he placed a plate of cheese at the foot of his bed.

109	Resignado, tomó su diente real, brillantes y lo colocó debajo de su almohada Luego, puso un plato de queso a los pies de su cama;. Su manera de pedir perdón.	←	Resigned, he took his real, shiny tooth and placed it under his pillow. Then, he placed a plate of cheese at the foot of his bed; his way of apologizing.
110	Resignado, tomó su diente real, brillantes y se pone debajo de la almohada. Luego puso un plato de queso a los pies de su cama a modo de disculpa.	←	Resigned, he took his real, shiny tooth and put it under his pillow. Then he put a plate of cheese at the foot of his bed by way of apology.
111	Con un suspiro, se quitó los dientes reales, brillante y se pone debajo de su almohada, pero él, poniendo un plato de queso a los pies de su cama;. Su manera de pedir perdón.	←	With a sigh, he took his real, shiny tooth and put it under his pillow. Then he placed a plate of cheese at the foot of his bed; his way of apologizing.
112	Resignado, ganó fuerza, tomando el diente fuera de su bolsillo y lo colocó bajo la almohada. A continuación, poner un pequeo plato con queso junto a su cama casi como una disculpa.	→	Resigned, gained strength, taking the tooth out of his pocket and placed it under his pillow. Then put a small dish with cheese next to her bed almost as an apology.
113	Resignado, sintiéndose más fuerte, él tomó el diente de su bolsillo y lo colocó bajo la almohada. Luego se puso un poco de queso en un plato pequeo al lado de su cama, casi como una disculpa.	←	Resigned, feeling stronger, he took the tooth out of his pocket and placed it under his pillow. Then he put some cheese on a small dish next to her bed, almost as an apology.
114	Resignado, ganó fuerza, tomando el diente de su bolsillo y lo colocó bajo la almohada. A continuación, poner un pequeo plato con queso junto a su cama casi como una disculpa	←	Resigned, gained strength, taking the tooth out of his pocket and placed it under his pillow. Then put a small dish with cheese next to her bed almost as an apology.....
Final Translation: Resigned, feeling stronger, he took the tooth out of his pocket and placed it under his pillow. Then he put some cheese on a small dish next to her bed, almost as an apology.			

Table A.21: Translation Data Collected with MonoTrans Widgets, sentence 0 on page 24.

#	**Spanish (source)**		**English (target)**
Original	Al levantarse, tropezó con el platito, sorprendido levantó la rebanada de queso y pudo ver en ella pequeas mordidas'		
	Al levantarse, tropezó con el platito, sorprendido levantó la rebanada de queso y pudo ver en ella pequeas mordidas'	→	On rising, stumbled against the saucer caught up slice of cheese on it and could see small bites' (machine translation)
1	Al levantarse, tropezó contra el platillo atrapados rebanada de queso sobre él y podía ver pequeos bocados	←	On rising, stumbled against the saucer caught up slice of cheese on it and could see small bites'
2	Al despertar, se encontró con el platillo, alcanzó la rebanada de queso y se ha visto en pequeos bocados	→	Upon awakening, he found the saucer, caught up the slice of cheese and it was seen in small bites'
3	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso sobre él y podía ver pequeos bocados	←	On rising stumbled against the saucer, caught up slice of cheese on it and could see small bites
4	Tropiezo contra el platillo al levantarse, coger el trozo de queso con bocados pequeos en él.	←	I stumble against the saucer on rising, catching the slice of cheese with small bites in it.
5	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso sobre él y podía ver pequeos bocados	←	On rising stumbled against the saucer, caught up slice of cheese on it and could see small bites
6	Al levantarse tropezó con el platillo, llamó la loncha de queso y que podía ver pequeos bocados	←	On rising stumbled against the saucer, caught the slice of cheese on it and could see small bites
7	Al levantarse, me tropecé contra el plato, cogió el trozo de queso y pudo ver a pequeos bocados en él.	←	On rising, I stumbled against the saucer, caught the slice of cheese and could see small bites on it.
8	El aumento me tropecé contra el plato, cogió el trozo de queso en él y se podía ver pequeos bocados.	←	On rising I stumbled against the saucer, caught the slice of cheese on it and could see small bites.
9	Opón en aumento, me encontré y vi un platillo, la loncha de queso y ver pequeos bocados.	←	Opon rising, I stumbled in and saw a saucer, the slice of cheese on it and see small bites.

10	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso y en él podía ver pequeos bocados	←	On rising stumbled against the saucer, caught up slice of cheese and on it could see small bites'
11	Mientras que el aumento se tropezó en el plato. Cogió el trozo de queso y vio unas pequeas marcas de mordeduras en él.	←	While rising he tripped on the saucer. He picked up the slice of cheese and saw small bite marks on it.
12	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso sobre él y podía ver pequeos bocados	←	On rising stumbled against the saucer, caught up slice of cheese on it and could see small bites'
13	Al levantarse, tropezó con el platillo, alcanzó una rebanada de queso sobre él y podía ver pequeos bocados.	←	On rising, stumbled against the saucer, caught up slice of cheese on it and could see small bites.
14	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso, y en él podía ver pequeos bocados	←	On rising stumbled against the saucer, caught up slice of cheese, and on it could see small bites
15	Al levantarse, tropezó con el plato, cogió el trozo de queso que había en él y pudo ver a pequeos bocados	←	Upon rising, he stumbled against the saucer, caught up the slice of cheese that was on it and could see small bites
16	Al levantarse, me tropecé contra el platillo. Tomé la loncha de queso y que podía ver pequeos bocados.	←	On rising, I stumbled against the saucer. I picked the slice of cheese on it and could see small bites.
17	Al levantarse, tropezó con el plato, cogió un trozo de queso, y en él podía ver pequeos bocados	←	On rising, he stumbled against the saucer, picked up a slice of cheese, and on it could see small bites
18	Al levantarse, tropezó en el platillo. Cogió el trozo de queso y que vio a pequeos bocados había sido tomado de él.	←	On rising, he stumbled into the saucer. He picked up the slice of cheese and that saw small bites had been taken from it.
19	Al levantarse tropezó con el plato, recogió la rebanada de queso de él y pudo ver a pequeos bocados	←	On rising he stumbled against the saucer, picked up the slice of cheese from it and could see small bites'

20	Al levantarse tropezó con el plato, cogió el trozo de queso y en él podía ver pequeos bocados	←	On rising stumbled against the saucer, caught up the slice of cheese and on it could see small bites'
21	Al levantarse tropezó con la placa, recogió la rebanada de queso sobre él y pudo ver a pequeos bocados	←	On rising he stumbled against the plate, picked up the slice of cheese on it and could see small bites
22	Al levantarse, me tropecé contra el plato, cogió el trozo de queso en él y pudo ver a pequeos bocados.	←	On rising, I stumbled against the saucer, caught the slice of cheese on it and could see small bites.
23	Mientras se está despierto, me tropecé contra el plato, cogió el trozo de queso y pudo ver a pequeos bocados en él.	←	While awakening, I stumbled against the saucer, caught the slice of cheese and could see small bites on it.
24	Al levantarse tropezó en el plato, cogió un trozo de queso y se dio cuenta de lo pequeos bocados	←	On rising stumbled into the saucer, caught a slice of cheese and noticed small bites on it
25	Al levantarse, tropezó con el plato, recogió el trozo de queso de ella y vi pedazos pequeos.	←	Upon rising, he stumbled against the saucer, picked up the slice of cheese from it and saw small bites.
26	Al levantarse, me tropecé contra el plato, tomé un trozo de queso de él y pudo ver a pequeos bocados.	←	On rising, I stumbled against the saucer, I picked up a slice of cheese from it and could see small bites.
27	Al levantarse, tropezó con el plato, cogió un trozo de queso, y en él, podía ver pequeos bocados	←	On rising, he stumbled against the saucer, picked up a slice of cheese, and on it, he could see small bites'
28	Al levantarse se topó con el plato, recogió la rebanada de queso sobre él y pudo ver a pequeos bocados	←	On rising he bumped the saucer, picked up the slice of cheese on it and could see small bites
29	Al levantarse, tropezó con el plato, cogió un trozo de queso en ella, y pudo ver a pequeos bocados.	←	On rising, he stumbled against the saucer, picked up a slice of cheese on it, and could see small bites.
30	Al levantarse tropezó con el platillo, alcanzó la loncha de queso y que podía ver pequeos bocados.	←	On rising he stumbled against the saucer, caught up the slice of cheese on it and could see small bites.

31	Al levantarse, me tropecé contra el plato, cogió el trozo de queso y en él podía ver pequeos bocados.	←	On rising, I stumbled against the saucer, caught the slice of cheese and on it could see small bites.
32	Al levantarse, tropezó con el platillo, alcanzó la loncha de queso y que podía ver pequeos bocados	←	On rising, he stumbled against the saucer, caught up the slice of cheese on it and could see small bites
33	Al levantarse tropezó con el platillo. Cogió el trozo de queso de él y pudo ver a pequeos bocados	←	On rising he stumbled against the saucer. He picked up the slice of cheese from it and could see small bites'
34	Al levantarse, me tropecé contra el plato, cogió el trozo de queso, y en él podía ver pequeos bocados.	←	On rising, I stumbled against the saucer, caught the slice of cheese, and on it could see small bites.
35	Al levantarse, tropezó con el plato, cogió un trozo de queso en él y pudo ver a pequeos bocados.	←	On rising, he stumbled against the saucer, picked up a slice of cheese on it and could see small bites.
36	Al levantarse por la maana, tropezó con el plato y se dio cuenta de que las picaduras de pequeos habían sido sacados del queso.	←	Upon rising in the morning, he stumbled against the saucer and noticed that small bites had been taken out of the cheese.
37	Al levantarse, tropezó contra el plato, cogió un trozo de queso en él y pudo ver a pequeos bocados	←	On rising, stumbled against the saucer, caught up a slice of cheese on it and could see small bites'
38	Al levantarse, se encontró con que el plato, miró el trozo de queso, y pudo ver a pequeos bocados.	←	Upon rising, he stumbled to the saucer, looked at the slice of cheese, and could see small bites.
39	Al levantarse tropezó con el plato, recogió la rebanada de queso sobre él y pudo ver a pequeos bocados	←	On rising he stumbled against the saucer, picked up the slice of cheese on it and could see small bites
40	Cuando se levantó, se tropezó con el plato, recogió el trozo de queso que había en él, y podía ver pequeas marcas mordedura.	←	When he got up, he tripped over the saucer, picked up the slice of cheese that was on it, and could see small bite marks.
41	Al levantarse tropezó con el platillo, una rebanada de queso con bocados pequeos estaba en ella.	←	On rising he stumbled against the saucer, a slice of cheese with small bites was on it.

42	Al levantarse, tropezó con el plato, recogió la rebanada de queso y fue capaz de ver pequeos bocados	←	On rising, he stumbled against the saucer, picked up the slice of cheese and was able to see small bites
43	Al levantarse tropezó con el platillo, alcanzó la loncha de queso y que podía ver pequeos bocados	←	On rising he stumbled against the saucer, caught up the slice of cheese on it and could see small bites
44	Cuando se levantó, se tropezó en el plato y cogió el trozo de queso. Podía ver a pequeos bocados fuera de él.	←	When he got up, he tripped on the plate and picked up the slice of cheese on it. He could see small bites out of it.
45	Al levantarse me tropecé contra el plato, cogió un trozo de queso y tuvo pequeos bocados	←	On rising I stumbled against the saucer, caught up a slice of cheese and took small bites
46	Al levantarse tropezó con el plato, cogió el trozo de queso en él y se podía ver pequeos bocados	←	On rising stumbled against the saucer, caught up the slice of cheese on it and could see small bites'
47	Al levantarse, me tropecé contra el plato, recogió la rebanada de queso sobre él y pudo ver a pequeos bocados	←	On rising, I stumbled against the saucer, picked up the slice of cheese on it and could see small bites
48	Cuando salió de la cama por la maana, tropezó con el plato, recogió el trozo de queso en él - y vio a pequeos bocados en el queso.	←	When he got out of bed in the morning, he stumbled against the saucer, picked up the slice of cheese on it – and saw small bites in the cheese.
49	Al levantarse, tropezó con el plato, recogió la rebanada de queso sobre él y pudo ver a pequeos bocados	←	On rising, he stumbled against the saucer, picked up the slice of cheese on it and could see small bites
50	Al levantarse tropezó con el plato, cogió un trozo de queso de ella, y pudo ver a pequeos bocados.	←	On rising he stumbled against the saucer, caught up a slice of cheese from it, and could see small bites.
51	Al levantarse, tropezó con el plato, cogió un trozo de queso a partir de ella y podía ver pequeas marcas mordedura.	←	On rising, he stumbled against the saucer, caught up a slice of cheese from upon it and could see small bite marks.
52	Al levantarse tropezó con el plato, cogió un trozo de queso de él y pudo ver a pequeos bocados.	←	On rising he stumbled against the saucer, caught up a slice of cheese from it and could see small bites.

53	Al levantarse, tropezó con el platillo, y alcanzó una rebanada de queso de ella, y pudo ver a pequeos bocados.	←	On rising, he stumbled against the saucer, and caught up a slice of cheese from it, and he could see small bites.
54	Al levantarse, tropezó con el platillo, alcanzó la loncha de queso y que podía ver pequeas marcas mordedura.	←	On rising, he stumbled against the saucer, caught up the slice of cheese on it and could see small bite marks.
55	Al levantarse tropezó con el plato, cogió un trozo de queso a partir de ella, y podía ver pequeas marcas mordedura.	←	On rising he stumbled against the saucer, caught up a slice of cheese from upon it, and could see small bite marks.
56	Al levantarse, tropezó con el plato, cogió un trozo de queso de ella, y pudo ver a pequeos bocados.	←	On rising, he stumbled against the saucer, caught up a slice of cheese from it, and could see small bites.
57	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso a partir de ella y pudo ver a pequeos bocados.	←	On rising he stumbled against the saucer, caught up slice of cheese from upon it and could see small bites.
58	Al levantarse, tropezó con el plato y tomó una rebanada de queso sobre ella. Podía ver que había pequeos bocados en él.	←	On rising, he stumbled against the saucer and he picked up slice of cheese on it. He could see there were small bites in it.'
59	Al levantarse tropezó con el plato, cogió un trozo de queso en él y pudo ver a pequeos bocados	←	On rising stumbled against the saucer, caught up a slice of cheese on it and could see small bites
60	Al levantarse se tropezó en el plato, cogió un trozo de queso y en él se podía ver pequeos bocados	←	On rising he tripped on the saucer, grabbed a slice of cheese and on it he could see small bites
61	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso sobre él y pudo ver a pequeos bocados	←	On rising he stumbled against the saucer, caught up a slice of cheese upon it and could see small bites'
62	Al levantarse de la cama, tropezó con el plato, recogió la rebanada de queso en ella, y vi que había pequeos bocados fuera de ella.	←	On rising from bed, he stumbled against the saucer, picked up the slice of cheese on it, and saw that there were small bites taken out of it.
63	Se cortó el queso y luego fuera de él en su pizza con olor agradable.	←	She cut the cheese and then out it on her nice smelling pizza.

64	Al levantarse, tropezó contra el plato, cogió un trozo de queso y se podía ver pequeos mordiscos en él.	←	On rising, stumbled against the saucer, caught a slice of cheese and could see small nibbles on it.
65	Al levantarse, tropezó con el plato, cogió un trozo de queso en él y pudo ver a pequeos bocados ... de qué?	←	On rising, he stumbled against the saucer, caught a slice of cheese on it and could see small bites ... of what?
66	Al levantarse, tropezó con el plato con la rebanada de queso sobre él, y pudo ver a pequeos bocados perdido	←	Upon rising, he stumbled against the saucer with the slice of cheese on it, and he could see small bites missing'
67	Se levantó y se tropezó con el platillo, golpeando el trozo de queso de. Cuando lo recogió él podía ver que las picaduras de pequeos habían sido sacados del queso.	←	He got up and tripped over the saucer, knocking the slice of cheese off. When he picked it up he could see that small bites had been taken out of the cheese.
68	Al despertar se topó contra el plato, tomó una rebanada de queso sobre él y pudo ver a pequeos bocados que falta!	←	Upon waking he stumbled against the saucer, picked up slice of cheese on it and could see small bites missing!
69	Al despertar, se topó con el plato, recogió la rebanada de queso sobre él y pudo ver a pequeos bocados	←	On awaking, he stumbled on the saucer, picked up the slice of cheese on it and could see small bites'
70	Al despertar, tropezó con el plato, recogió el plato con una rebanada de queso sobre él y pudo ver a pequeos bocados que faltan	←	On waking he stumbled against the saucer, picked the saucer up with slice of cheese on it and could see small bites missing
71	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso sobre él y podía ver pequeos bocados que puede ser un ratón o algo els	←	On rising stumbled against the saucer, caught up slice of cheese on it and could see small bites it can be a mouse or something els
72	Cuando se levantó, tropezó con el plato, lo recogió, con una rodaja de queso todavía en él y pudo ver a pequeos bocados que faltaban	←	When he got up, he stumbled against the saucer, he picked it up, with slice of cheese still on it and could see small bites were missing
73	Al levantarse tropezó con el plato, cogió un trozo de queso de ella y vio a mordiscos pequeos.	←	On rising he stumbled against the saucer, picked up a slice of cheese from it and saw small nibbles.

74	Al despertar, tropezó con el plato, lo recogió con la loncha de queso y que podía ver pedacitos pequeos habían desaparecido	←	Upon waking, he stumbled against the saucer; he picked it up with the slice of cheese on it and could see small bites were missing
75	Al levantarse tropezó con el platillo, alcanzó la loncha de queso y que podía ver pequeos bocados	←	On rising he stumbled against the saucer, caught up the slice of cheese on it and could see small bites'
76	Cuando se levantó, tropezó con el plato, lo recogió con la rebanada de queso todavía en él y pudo ver que faltaban pequeos bocados	←	When he got up, he stumbled against the saucer, picked it up with the slice of cheese still on it and could see that small bites were missing'
77	Cuando se levantó, tropezó con el platillo; recogerlo, con la rebanada de queso todavía en él, pudo ver que las picaduras de pequeos habían desaparecido.	←	When he got up, he stumbled against the saucer; picking it up, with the slice of cheese still on it, he could see that small bites were missing.
78	Cuando se levantó, tropezó contra el plato, lo recogió con la rebanada de queso todavía en él y pudo ver biteswere pequea perdido	←	When he got up he stumbled against the saucer, he picked it up with the slice of cheese still on it and could see small biteswere missing'
79	Al levantarse, tropezó con la placa, alcanzó la rebanada de queso y se dio cuenta de la diminutos pedazos.	←	On rising, he stumbled over the plate, caught up the slice of cheese and noticed the tiny bites.
80	Cuando se despertó, se topó con el plato y cogió el trozo de queso en él, y él podía ver pequeos bocados	←	when he woke up,he stumbled on the saucer and picked up the slice of cheese on it, and he could see small bites'
81	Cuando se levantó, tropezó contra el platillo; recogerlo vio la loncha de queso que tenía ver pequeos bocados perdido	←	When he got up he stumbled against the saucer; picking it up he saw the slice of cheese on it had see small bites missing'
82	Al levantarse, miró a la rebanada de queso y se podía ver pequeos bocados	←	Upon rising, he looked at the slice of cheese and could see small bites
83	Cuando se levantó, se tropezó en el plato, recogió la rebanada de queso, y pudo ver a pequeos bocados en él.	←	When he got up, he stumbled on the saucer, picked up the slice of cheese, and could see small bites on it.

84	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso sobre él y podía ver pequeos bocados	←	Upon rising stumbled against the saucer, caught up slice of cheese on it and could see small bites'
85	Cuando se despertó, se tropezó en el plato. La rebanada de queso aún estaba allí, pero podía ver pequeos bocados fuera de ella.	←	When he awoke, he tripped on the saucer. The slice of cheese was still there but he could see small bites taken out of it.
86	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso sobre él y podía ver pequeos bocados.	←	On rising stumbled against the saucer, caught up slice of cheese on it and could see small bites.
87	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso en él y pudo ver bites'On pequeo aumento, tropezó con el platillo, la captura de un piojo de queso con picaduras.	←	On rising stumbled against the saucer, caught up slice of cheese on it and could see small bites'On rising, stumbled against the saucer, catching a lice of cheese with bites.
88	Cuando se despertó, tropezó con la placa y quedó atrapado en una rebanada de queso. Podía ver trozos pequeos.	←	When he woke up, he stumbled against the plate and got caught on a slice of cheese. He could see small bites.
89	Al levantarse, tropezó en el plato, vi una rebanada de queso sobre él y podía ver pequeos bocados.	←	Upon rising, he stumbled into the saucer, saw slice of cheese on it and could see small bites.
90	Cuando se levantó, tropezó con el plato, recogió la rebanada de queso sobre él y pudo ver a pequeos bocados	←	When he rose, he stumbled against the saucer, picked up the slice of cheese on it and could see small bites'
91	Al levantarse, tropezó con el plato, tomó una rebanada de queso sobre él y pudo ver a pequeos bocados	←	On rising, he stumbled against the saucer, picked up slice of cheese on it and could see small bites'
92	Al levantarse, tropezó con el plato, recogió el trozo de queso en él y espiado pequeos bocados	←	On rising, he stumbled against the saucer, picked up slice the of cheese on it and spied small bites'
93	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso en él y pudo ver bitesykjljodscbhsdfcbhkxvwa-hahnbcsavhrcbh pequeos	←	On rising stumbled against the saucer, caught up slice of cheese on it and could see small bitesykjljodscbhsdfcbhkxvwa-hahnbcsavhrcbh

94	Al levantarse, tropezar con el plato, se inclinó para examinar la loncha de queso y que podía ver pequeos bocados.	←	On rising, stumbling against the saucer, he bent to examine the slice of cheese on it and could see small bites.
95	Al levantarse, tropezó con el platillo, llamó la loncha de queso y que podía ver pequeos bocados	←	On rising, he stumbled against the saucer, caught the slice of cheese on it and could see small bites
96	Cuando se levantó, golpeó contra el plato, recogió la rebanada de queso y pudo ver a pequeos bocados.	←	When he got up, he knocked against the saucer, picked up the slice of cheese and could see small bites.
97	Al levantarse tropezó con el platillo, alcanzó una rebanada de queso sobre él y podía ver pequeos bocados	←	On rising stumbled against the saucer, caught up slice of cheese on it and could see small bites'
98	Al levantarse tropezó con el plato, recogió la rebanada de queso de él y pudo ver a pequeos bocados de ella	←	On rising he stumbled against the saucer, picked up the slice of cheese from it and could see small bites out of it
99	Al levantarse tropezó con el plato, recogió la rebanada de queso y se dio cuenta que había pequeos bocados	←	On rising she stumbled over the saucer, picked up the slice of cheese and noticed it had small bites
100	Se despertó y se tambaleó hacia la placa. Cogió el trozo de queso y pudo ver a pequeos bocados.	←	He woke up and stumbled towards the plate. He picked up the slice of cheese and could see small bites.
101	Al levantarse, tropezó con el platillo, alcanzó la loncha de queso y que podía ver pequeos bocados.	←	On rising, he stumbled against the saucer, caught up the slice of cheese on it and could see small bites.
102	Se despertó y al levantarse tropezó con el platillo, alcanzó una rebanada de queso en él y en el examen que podía ver pequeos bocados había sido tomado de los quesos.	←	He woke and on rising stumbled against the saucer, caught up slice of cheese on it and upon examination he could see small bites had been taken from the cheese.
103	Cuando se levantó, tropezó con el plato, vio loncha de queso con bocados pequeos.	←	When he got up, he stumbled against the saucer, saw slice of cheese on it with small bites.

104	Al levantarse, tropezó con el plato, recogió el trozo de queso en él, y él podía ver pequeas marcas picadura	←	Upon rising, he stumbled against the saucer, picked up the slice of cheese on it, and he could see small bite marks
105	Al levantarse, tropezó con el platillo, alcanzó una rebanada de queso sobre él y podía ver pequeos bocados	←	On rising, stumbled against the saucer, caught up slice of cheese on it and could see small bites
106	Al levantarse, me tropecé contra el plato, cogió un trozo de queso en él y pudo ver a pequeos bocados	←	On rising, I stumbled against the saucer, picked up a slice of cheese on it and could see small bites
107	Al levantarse se tambaleó hacia el plato, recogió la rebanada de queso en él y pudo ver a pequeos bocados	←	On rising he stumbled over to the saucer, picked up the slice of cheese on it and could see small bites'
108	Uponn aumento, tropezó con el platillo, atrapados loncha de queso y se podía ver pequeos bocados	←	Uponn rising, he stumbled against the saucer, caught up slice of cheese on it and could see small bites
109	Al levantarse, tropezó con el plato, tomó una rebanada de queso en él y pudo ver a pequeos bocados	←	On rising, he stumbled over to the saucer, picked up slice of cheese on it and could see small bites
110	Al levantarse, tropezó con el platillo que tenía el queso en él y pudo ver a pequeos bocados.	←	On rising, he stumbled on the saucer that had the cheese on it and could see small bites.
111	Al levantarse, tropezó en el plato con el queso en él y pudo ver a pequeos bocados	←	On rising he stumbled on the saucer with the cheese on it and could see small bites'
112	Al levantarse, tropezó con el platillo, atrapados loncha de queso y se podía ver pequeos bocados	←	On rising, he stumbled against the saucer, caught up slice of cheese on it and could see small bites'
113	Al levantarse, tropezó contra el plato, alcanzó la loncha de queso y vi pequeos bocados	←	On rising, stumbled against the saucer, caught up the slice of cheese on it and saw small bites
114	Al levantarse, tropezó contra el platillo levantó sorprendido rebanada de queso y se ha visto en pequeos bocados	→	On rising, stumbled against the saucer lifted surprised slice of cheese and it was seen in small bites

115	Al levantarse, tropezó con la placa y entabló una rebanada de queso, que tenía pequeos bocados	→	On rising, stumbled over the plate and struck up a slice of cheese, which had small bites
116	Al levantarse, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	On rising, he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it.
117	Al despertar, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Awaking, he tripped on the saucer and was surprised to see the slice of cheese had small bites out of it.
118	Al despertar, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Awakening, he tripped on the saucer and was surprised to see the slice of cheese had small bites out of it.
119	Al despertar, se tropezó en el plato y sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Awaking, he tripped on the saucer and surprised to see the slice of cheese had small bites out of it.
120	Al levantarse, tropezó con el platillo. Levantamiento de la rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	On rising, he stumbled against the saucer. Lifting the slice of cheese, he was surprised to see it had small bites taken out of it.
121	Al despertar, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Awaking, he tripped on the saucer and was surprised to see the slice of cheese had small bites out of it.
122	Al despertar, se tropezó en el plato y se sorprendió al ver el trozo de queso pequeos bocados había en ella ..	←	Awaking, he tripped on the saucer and was surprised to see the slice of cheese had small bites in it..
123	Al despertar, se tropezó en el platillo y se sorprendió al ver que la rebanada de queso había pequeos bocados fuera de él.	←	Upon awaking, he tripped on the saucer and was surprised to see that the slice of cheese had small bites out of it.
124	Al levantarse, tropezó en el plato. Levantó la rebanada de queso y se sorprendió al ver que había pequeos bocados fuera de ella.	←	Upon rising, he stumbled onto the saucer. He lifted the slice of cheese and was surprised to see it had small bites taken out of it.

125	en estado de shock, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella, crees que podría haber sido un ratón pensó. Al final era cierto,	←	in shock, he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it, do you think it could of been a mouse he thought. At last it was true,
126	Al despertar, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Awaking, he tripped on the saucer and Was surprised to see the slice of cheese had small bites out of it.
127	Al despertar, se tropezó en el platillo y se sorprendió al ver que la rebanada de queso tenía picaduras pequeas carencias.	←	Awakening, he tripped on the saucer and was surprised to see that the slice of cheese had small bites missing from it.
128	Al despertar, se tropezó en el plato y sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Waking, he tripped on the saucer and surprised to see the slice of cheese had small bites out of it.
129	Al levantarse, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados.	←	On rising, he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see it had small bites.
130	Al levantarse se tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver a pequeos bocados fuera de ella.	←	On rising he stumbled over the saucer. Lifting a slice of cheese, he was surprised to see small bites taken out of it.
131	Cuando se levantó, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	When he stood up, he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see that it had small bites taken out of it.
132	Al levantarse, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeas porciones sacadas de it.Ggggggyhhhhhhhhhhhhhhhhhhnnjjhj, gfyfyjjftelklklpoi	←	On rising, he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it.Ggggggyhhhhhhhhhhhhhhhhhhnnjjhj,gfyfy

133	Al despertar, se tropezó en el platillo y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Awaking, he tripped on the saucer and he was surprised to see the slice of cheese had small bites out of it.
134	Se despertó, tropezó con el platillo y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	He woke up, stumbled over the saucer and was surprised to see the slice of cheese had small bites out of it.
135	Al despertar, se tropezó en el platillo y se sorprendió al ver que la rebanada de queso había pequeos bocados fuera de él.	←	Awaking, he tripped on the saucer and was surprised to see that the slice of cheese had small bites out of it.
136	Se despertó y tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	He woke up and stumbled over the saucer. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it.
137	Al levantarse, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que tenía marcas de mordedura pequea.	←	On rising, he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see it had small bite marks.
138	Al despertar, se tropezó en el plato, y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Awakening, he tripped on the saucer, and was surprised to see the slice of cheese had small bites out of it.
139	Al despertar, se tropezó en el plato, sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Awaking, he tripped on the saucer, surprised to see the slice of cheese had small bites out of it.
140	Al despertar, se tropezó en el platillo y wassurprised para ver el trozo de queso había pequeos bocados fuera de él.	←	Awakening, he tripped on the saucer and wassurprised to see the slice of cheese had small bites out of it.
141	Despierto, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Awake now, he tripped on the saucer and was surprised to see the slice of cheese had small bites out of it.
142	Al despertar, se tropezó en el plato y sorprendió al ver el trozo de queso pequeos bocados había en ella.	←	Awaking, he tripped on the saucer and surprised to see the slice of cheese had small bites in it.

143	Cuando se despertó se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	When he woke he tripped on the saucer and was surprised to see the slice of cheese had small bites out of it.
144	Cuando salió de la cama tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella!	←	When he got out of bed he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it!
145	Al despertar, se tropezó en el platillo y se sorprendió al ver que la rebanada de queso con agujeros pequeos mordido en ella.	←	Awaking, he tripped on the saucer and was surprised to see that the slice of cheese had small holes bitten into it.
146	Al despertar, se tropezó en el platillo y se sorprendió al ver que la rebanada de queso había pequeos bocados fuera de ella.	←	Awaking, he tripped on the saucer and was surprised to see that the slice of cheese had small bites taken out of it.
147	Sacó su diente, lo colocó debajo de su almohada y le dejó un plato de queso a los pies de la cama a modo de disculpa.	←	He took out his tooth, placed it under his pillow and left a plate of cheese at the foot of the bed by way of an apology.
148	Levantarse de la cama, tropezó con el platillo y se sorprendió al ver el pedazo de queso había pequeos bocados fuera de ella.	←	Getting out of bed, he tripped over the saucer and was surprised to see the piece of cheese had small bites taken out of it.
149	Levantarse de la cama, tropezó con el platillo. Recogiendo una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	Getting out of bed, he tripped over the saucer. Picking up a slice of cheese, he was surprised to see it had small bites taken out of it.
150	El aumento, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	Rising, he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it.
151	Al despertar, se tropezó en el plato. Se sorprendió al ver que había pequeos bocados tomados de la rebanada de queso.	←	Upon awakening, he tripped on the saucer. He was surprised to see that there were small bites taken from the slice of cheese.
152	Al despertar, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados de la misma.	←	Upon awaking, he tripped on the saucer and was surprised to see the slice of cheese had small bites on of it.

153	Por la maana, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	In the morning, he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it.
154	Al despertar, se tropezó en el plato y él / ella se sorprendió al ver el trozo de queso que tiene pequeas porciones de ella.	←	Awaking, he tripped on the saucer and he/she was surprised to see the slice of cheese that has small bites out of it.
155	Al despertar se tropezó con el platillo. Se sorprendió al ver que el trozo de queso había pequeos bocados fuera de él.	←	Upon wakening he tripped over the saucer. He was surprised to see that the slice of cheese had small bites out of it.
156	Cuando se despertó, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	When he woke up, he stumbled against the saucer. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it.
157	Cuando se despertó, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de ella.	←	When he awoke, he tripped on the saucer and was surprised to see the slice of cheese had small bites taken out of it.
158	Al despertar, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de ella.	←	Awaking, he tripped on the saucer and was surprised to see the slice of cheese had small bites taken out of it.
159	Al despertar, se tropezó en el plato y sorprendió al ver el trozo de queso había pequeos bocados de it.sex!	←	Awaking, he tripped on the saucer and surprised to see the slice of cheese had small bites out of it.sex!
160	Al levantarse, tropezó con el platillo. Después de levantar un trozo de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	Upon rising, he stumbled against the saucer. After lifting a slice of cheese, he was surprised to see it had small bites taken out of it.
161	Rápidamente levantarse de la cama, tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de ella.	←	Quickly getting out of bed, he tripped on the saucer and was surprised to see the slice of cheese had small bites taken out of it.

162	Cuando se despertó, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	When he woke up, he tripped on the saucer and was surprised to see the slice of cheese had small bites out of it.
163	Cuando se despertó y salió de la cama, tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de ella.	←	When he woke up and got out of bed, he tripped on the saucer and was surprised to see the slice of cheese had small bites taken out of it.
164	Al levantarse, tropezó con el platillo. Levantamiento de una rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	On rising, he stumbled over the saucer. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it.
165	Al levantarse, tropezó con la saucer.picking la rebanada de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	On rising, he stumbled against the saucer.picking up the slice of cheese, he was surprised to see it had small bites taken out of it.
166	Despertado, se tropezó en el plato y se sorprendió al ver el trozo de queso había pequeos bocados fuera de él.	←	Woken, he tripped on the saucer and was surprised to see the slice of cheese had small bites out of it.
167	Al despertar, se tropezó en el plato, y se sorprendió al ver que el trozo de queso había pequeos bocados fuera de él.	←	Awaking, he tripped on the saucer, and was surprised to see that the slice of cheese had small bites out of it.
168	Al levantarse, tropezó con la mesa. Levantar una rodaja de queso, se sorprendió al ver que había pequeos bocados fuera de ella.	←	Upon rising, he stumbled against the table. Lifting a slice of cheese, he was surprised to see it had small bites taken out of it.
169	Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso había pequeos bocados.	→	Upon waking, he stumbled on the plate and was surprised to see that the piece of cheese had small bites.
170	Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso pequeos bocados había tomado.	←	Upon waking, he stumbled on the plate and was surprised to see that the piece of cheese had small bites taken.

171	Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso pequeos bocados había despegado de ella.	←	Upon waking, he stumbled on the plate and was surprised to see that the piece of cheese had small bites taken off of it.
172	Al despertar, se topó con la placa y se sorprendió al ver que pequeos bocados había sido mordisqueado el trozo de queso.	←	Upon waking, he stumbled on the plate and was surprised to see that small bites had been nibbled off the piece of cheese.
173	Al despertar, se topó con la placa. Se sorprendió al ver que el pedazo de queso pequeos bocados había tomado de él.	←	Upon waking, he stumbled on the plate. He was surprised to see that the piece of cheese had small bites taken from it.
174	Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso había pequeos bocados fuera de ella.	←	Upon waking, he stumbled on the plate and was surprised to see that the piece of cheese had small bites taken out of it.
175	Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso pequeos bocados había tomado de él.	←	Upon waking, he stumbled upon the plate and was surprised to see that the piece of cheese had small bites taken from it.
176	Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso habían sido mordisqueó.	←	Upon waking, he stumbled upon the plate and was surprised to see that the piece of cheese had been nibbled at.
177	Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso pequeos bocados había despegado de ella.	←	Upon waking, he stumbled upon the plate and was surprised to see that the piece of cheese had small bites taken off of it.
178	Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso pequeos bocados había tomado de él.	←	Upon waking, he stumbled on the plate and was surprised to see that the piece of cheese had small bites taken from it.
179	. Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso pequeos bocados había despegado de ella.	←	.Upon waking, he stumbled on the plate and was surprised to see that the piece of cheese had small bites taken off of it.
180	Al despertar, se topó con la placa y se sorprendió al ver a pequeos bocados había sido tomado de la pieza de queso.	←	Upon waking, he stumbled on the plate and was surprised to see small bites had been taken from the piece of cheese.

181	Despertar, se topó con la placa, y se sorprendió al ver que el pedazo de queso había pequeos bocados fuera de ella.	←	Waking up, he stumbled on the plate, and was surprised to see that the piece of cheese had small bites taken out of it.
182	Al despertar, se topó con la placa, sorprendió al ver pequeos mordiscos en el pedazo de queso.	←	Upon waking, he stumbled onto the plate, surprised to see small bites in the piece of cheese.
183	Al despertar, se topó con la placa y se sorprendió al ver que el pedazo de queso tenía picaduras pequeas tomadas fuera de él.	←	Upon waking, he stumbled on the plate and was surprised to see that the piece of cheese had small bites taken off it.
Final Translation: Upon waking, he stumbled on the plate and was surprised to see that the piece of cheese had small bites taken.			

Table A.22: Translation Data Collected with MonoTrans Widgets, sentence 1 on page 24.

#	**Spanish (source)**		**English (target)**
Original	El ratón había acudido a la cita!		
	El ratón había acudido a la cita!	→	The mouse had come to the appointment! (machine translation)
1	El ratón había llegado a la cita!	←	The mouse had come to the appointment!
2	El ratón pequeo, gris había llegado!	←	The small ,gray mouse had arrived!
3	El ratón llegó a la cita!	←	The mouse came to the appointment!
4	El ratón había llegado!	←	The mouse had come!
5	El ratón fue	←	The mouse came
6	El ratón había llegado! Valiente y fuerte el ratón trajo queso	←	The mouse had come!Brave and strong the Mouse brought cheese
7	El ratón ha llegado	←	The mouse has arrived
8	El ratón llegó a su cita.	←	The mouse arrived at his appointment.
9	El ratón fue!	←	The mouse came!
10	El ratón llegó a la cita.	←	The mouse came to the appointment.
11	El ratón llegó según lo prometido!	←	The mouse came as promised!
12	El ratón había llegado! . .	←	The mouse had come! . .
13	El ratón había llegado durante la noche!	←	The mouse had come during the night!
14	El ratón volvió, después de todo!	←	The mouse came back, after all!

15	El ratón llegó a la cita!	←	The mouse came to the appointment!
16	El ratón tenía a la cita!	←	The mouse had kept the appointment!
17	El ratón fue engaado!	←	The mouse was tricked!
18	El ratón se fue!	←	The mouse had came!
19	El ratón se dirigió a la cita!	←	The mouse went to the appointment!
20	El ratón había llegado!	←	The mouse had arrived!
21	El ratón ha llegado!	←	The mouse has come!
22	El ratón llegó a la cita.	←	The mouse came to the appointment.
23	La puesta había llegado!	←	The mise had come!
24	Los tres cerditos Espaol a Inglés	←	The three little pigs spanish to english
25	El ratón había estado allí!	←	The mouse had been there!
26	El ratón suave no tardó en llegar a la última cita!	←	The gentle mouse came quickly to the last appointment!
27	El ratón llegó a la cita!	←	The mouse came to the appointment!
28	El ratón había llegado a la cita!	→	The mouse had come to the appointment!
29	El ratón había llegado a la cita.	←	The mouse had come to the appointment.
30	Un ratón había llegado a la cita.	←	A mouse had come to the appointment.
31	El ratón se acercó.	←	The mouse approached.
32	Un ratón llegó a la cita.	←	A mouse came to the appointment.
33	El ratón había hecho de su nombramiento.	←	The mouse had made it to his appointment.
34	Un ratón llegó a la cita.	←	A mouse came for the appointment.
Final Translation: The mouse had come to the appointment.			

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