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## TRANSLATION / VERTIMAS

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# A comparative study on effects of controlled English on the translatability of technical texts from English to Turkish

Kontroliuojamos anglų kalbos poveikio techninių tekstų vertimui iš anglų kalbos į turkų kalbą lyginamasis tyrimas

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## Abstract

Controlled language, as a subset of natural language, refers to the restricted or standardised use of lexicon, grammar, and style. It has been hypothesised that the use of controlled language makes technical texts more translatable and therefore more understandable. This paper reports the results of an experimental study designed to test this hypothesis. To try out the hypothesis, a text written in controlled technical language and standard technical language was translated by 40 participants. The participants did not see any difference between the two texts in terms of translatability. The texts were analysed qualitatively and quantitatively. In terms of accuracy, language style and textual cohesion, the translated texts turned out to be more appropriate in the context of controlled technical English. However, it has been also shown that the participants, regardless of the text types, are still loyal to the source text, ignoring the fact that they are translating for a new audience. Conclusively, the results showed that controlled technical language improved the comprehensibility and translatability of technical documentation in terms of accuracy, style and text quality. The study suggests that international companies should employ technical writers and translators who prioritise the language and extralinguistic norms of the target audience, rather than blindly adhering to the source text.

**KEYWORDS:** Translation studies, controlled language, translatability, technical translation, technical communication.

## Introduction

*Controlled language* (CL), which encapsulates the restriction of a natural language that imposes constraints on lexicon, grammar and style (Huijsen, 1998), is certainly finding its way into technical texts, as CL can theoretically “improve the comprehensibility and translatability of technical documentation” (Spyridakis et al., 1997, p. 4). In the past and today, many well-known international companies such as *Boing*, *Caterpillar*, *Kodak* and *Xerox* are increasingly requiring technical writers to produce

texts (Adriaens & Schreors, 1992) that are acceptable in the target languages in terms of “translatability, comprehensibility, readability and usability” (O’Brien, 2010, p. 143). Thus, a growing body of recent research in Translation Studies (TS) has focused on CL and its applications under the headings of translatability, comprehensibility, readability and usability, i.e. the impact of CL on machine translation productivity (see, for example, Kamprath et al., 1998; Marzouk, 2021; Nyberg & Mitamura, 1996; Reuther, 2003); the effects of CL on comprehensibility (e.g. Shubert et al., 1995) and the effects of CL on translatability (Spyridakis et al., 1997).

It is assumed that the application of CL “allows for more translatability” (Mogensen, 2004, p. 244) and “benefits text comprehension” (Rodríguez Vázquez, 2015, p. 193) of both source (ST) and target (TT) texts. However, experimental studies to prove these assumptions are not enough between language pairs. Therefore, the researcher aims to fill this gap by investigating if and how the usage of controlled language allows for more translatable technical texts in English-Turkish language pair. This study is limited to the analysis of translatability as it has a direct impact on the comprehensibility, readability, and usability of source text (ST) and target text (TT). The translatability of the technical text was appraised employing the translatability scale introduced by Spyridakis et al. in 1997. Yet, it was improved, updated, and expanded to cater to the needs of the current research.

It can be argued that more empirical evidence is needed to prove that controlled technical writing is more translatable than standard technical English between language pairs. In order to prove or disprove the above hypothesis, the following two hypothesis-related research questions are posed:

- 1 Is the text written in controlled technical English more translatable?
- 2 Does the controlled technical text result in a more acceptable text in the norms of the target language, namely the Turkish language?

The structure of the paper is as follows: first, certain concepts related to controlled language and translatability in relation to translation studies are presented. Then, methodology is presented, followed by a discussion of the findings. The paper concludes with a discussion of the findings and some suggestions for future work.

## Theoretical Background

### One word, one meaning

As a subset of natural language, controlled language refers to the restricted or standardised use of lexicon, grammar, and style. As Mogensen (2004) notes, CL is characterised by standardised terminology, a restricted core vocabulary and a set of grammatical and stylistic rules. The aim of CL is to facilitate intralingual as well as interlingual communication by avoiding ambiguity and thus reducing ambiguity and providing greater consistency and readability in technical documents (Holmback et al., 1996).

In CL, language constraints are thought to increase readability and comprehensibility and reduce ambiguity, especially for technical documentation (Cadwell, 2008; O’Brien, 2010), on the grounds that globalisation is increasingly forcing international companies to consider the communicative needs of their consumers. As a result, these companies require their technical writers to produce documents that are accurate, correct, consistent and easy to read. Such companies also need to ensure that these documents are understandable and readable by both the source and target audiences, as any misunderstanding or mistranslation could expose these global companies to serious ethical and economic liabilities and losses. Another aim of CL is to reduce the cross-cultural communication challenges that the translator is most likely to face in the translation process. The use of CL is therefore best suited to technical translation, where the primary aim is to produce texts that are concise and unambiguous, and where cross-cultural communication challenges are minimised. Technical writers and translators have one important task in common in technical translation: to create a text and to communicate with the target audience through that text.

Although recent calls for controlled and standardised language have been accelerated by certain global corporations, such attempts actually date back to the time of Comenius, who was “deeply concerned with the search for a universal language” (Sadler, 2007, p. 137), in which denotative, definite and unambiguous meanings of words are proposed, rather than connotative, rhetorical and figurative meanings of words. The search for a

simplified subset of regular English did not end with the efforts of Comenius but continued with the publication of Charles Kay Ogden's *Basic English: A General Introduction with Rules and Grammar* in 1930. Ogden's rules laid the foundation for CL, which aims to produce a language that is independent of users and contexts, as opposed to ordinary language, which is contextual and user dependent. *Caterpillar Tractor Company's Caterpillar Fundamental English* elaborated on CL in 1972 (Verbeke, 1973). CL was officially adopted and modified by the *Association Europeene de Constructeurs de Material Aerospacial* (AECMA) for use in technical documentation in the aerospace industry (Hoard et al., 1992; Spyridakis et al., 1997).

Today, global companies, including *Boeing*, require the use of CL or Simplified Technical Language (ASD-STE100, 2021) when writing technical documents. The rules for controlled language were revised in 2021. The researcher simplified and presented the general rules of CL for readers and research purposes (See Appendix A). The examples are taken from this guide with little or no change.

CL has a set of rules that purport to make technical documents and their translations more translatable and understandable. CL has a core vocabulary with an accepted meaning. CL consists of writing rules that restrict grammar and style. Some sentences written in CL and Non-CL are compared as follows:

**Ex 1a**    Non-CL    *Test the system for leaks.*

**Ex 1b**    CL         *Do the leak test of the system.*

According to the CL writing rules, the word *test* is an acceptable noun, but not an acceptable verb. So (1a) is not acceptable. The dictionary gives an alternative word that belongs to the same part of speech when the word is unacceptable. The following sentences illustrate this case:

**Ex 2a**    Non-CL    *A value of 2 mm is acceptable.*

**Ex 2b**    CL         *A value of 2 mm is permitted.*

The word *acceptable* is not allowed in its adjective form. The dictionary then offers the word *permitted* as an alternative. Each approved word in the dictionary has a specific and restricted approved meaning. Therefore, the technical writer must use these words with their approved meanings. For example, the accepted meaning of the word *follow* is *to come after* and not *to obey*. The following sentences illustrate this:

**Ex 3a**    Non-CL    *Follow the safety instructions.*

**Ex 3b**    CL         *Follow the green lights to the nearest staircase.*

**Ex 3c**    CL         *Do the instructions that follow.*

CL provides a list of categories with examples to help technical writers use technical names correctly. You can use words that you can include in a technical name category. According to the CL rules, even if a word is not approved in the dictionary, it is acceptable if it is used as a technical name. The following sentence is an example:

**Ex 4a**    CL         *The base of the triangle is 5 cm.*

**Ex 4b**    Non-CL    *Ensure that the two spigots at the base of the unit engage.*

In (4a), the word *base* is accepted because it is used as a technical word, even though the dictionary does not consider it to be an accepted word. In Example 4b, however, the word *base* is not accepted because it is not used as a technical word.

These limited but striking examples show how difficult it is to write technical texts in CL because of the obvious limitations. However, several companies force technical writers to write technical texts in CL, on the anecdotal assumption that this type of writing is easier to translate and understand. In this study, the researcher tested these assumptions between two language pair: English and Turkish.

### Translatability

Coupled with the concept of equivalence, which has always been a perennial and thorny issue, the concept of (un)translatability began to be discussed even before translation studies was seen as a field of study in its own right. Historically, “the universalists and the monadists” (de Pedro, 1999, p. 546) have characterised approaches to the question of translatability. Monadist approaches are mainly based on Edward Sapir’s and Benjamin Whorf’s premise that each linguistic community interprets reality in its own unique way. Monadists agree that successful or adequate translation is impossible. For example, translation researchers such as Catford (1965) and Jakobson (2004) explained the incommensurability of languages, emphasising that there is no complete equivalence of code units between languages. However, as Large et al. (2019) argue, if we define translation as such, every word is untranslatable. Apart from the incommensurability of languages, structural differences between languages and historically insurmountable linguistic and cultural differences between languages, such as the sanctions of religious and authoritarian regimes, imposed the concept of untranslatability (Glynn & Hadley, 2021). Over the years, however, the notion of translatability has changed significantly. It has become the possibility of conveying in the target text what is intended to be communicated in the source text (Sun, 2012, 2018). Every translation is an alternative to an infinite alternative. Translators can produce different texts according to the need of the target audience. It is an undeniable fact that something is lost in translation; on the other hand, much is gained through translation. As Bassnett (1998, p. 70) points out, “poetry is not what is lost in translation, but what we gain through translations and translators.” Today, it is the translator’s task “to render the original text with a particular context comprehensible to the target reader” (Xiumei & Qinyan, 2012, p. 408).

This study is based on the universalist approach to translation that translatability is possible through the existence of linguistic universals; as Wills (1982) emphasizes, language structural and cultural variations are not a barrier to language translation because it is possible to express the ideas of human experience in any human language.

### Technical translation, technical communication, and translatability

Technical communication is the goal of technical translation. Today, the fields of technical translation and technical writing are increasingly converging. Traditionally, the source text has been the ultimate decisive factor in equivalence-based translation theories. Recently, however, especially in non-literary fields, the focus of translation theory has shifted from source text-based approaches to more communicative approaches (Byrne, 2012), as the impetus has been the message, the target audience and the content. With the advent of target text based approaches, such as the *Skopos theory* developed by Vermeer (1978/2004) along with the *relevance theory* proposed by Gutt (1991), *descriptive translation studies* advocated by Toury (2012) and *functionalism* by Reiss (2000), translation theories have undergone a paradigm shift, and thus translated texts have been perceived as texts produced in the target environment for the target culture and readership.

Functionalist approaches, in particular, regard the source text as a text from which the translator extracts information (Vermeer, 2004). Functionalist approaches view the source text as a text from which the translator obtains information (Reiss, 2000; Vermeer, 2004). The translator is granted unlimited freedom to adapt the source texts to meet the needs of the target audience. Technical translation, where the accurate, correct, concise and clear dissemination of information (Herman, 1993, p. 10; Pinchuck, 1977) and the function of the text are paramount, may benefit from functional approaches, where translators can choose their translation strategies by adopting the right register for the text (Kingscott, 2002), according to the expectations of the target audience without changing the primary function of the text, which is to inform. With the help of functional approaches, technical communication has become the goal of technical translation. Technical translators take on the role of technical communicators as “technical communication concerns itself with the creation of texts in a comprehensive, communicative sense” (Risku & Pircher, 2008, p. 156). Recently, not only technical translators, but also technical writers as technical communicators are reaping the benefits of working together to make information accessible (Batova, 2014, 2018; Gonzales, 2022). Functional theories theoretically benefit technical translation as they genuinely acknowledge the responsibilities, expectations, and obligations of translators as well as the professional reality of translation (Byrne, 2006). In fact, the importance of technical translators in making information accessible to the target audience has been acknowledged (Gonzales, 2022).

In the translation of technical documents, the translation process is only one of several internal and external factors that have been described as “controlling influences” (Schubert, 2009, p. 17). Technical communication, which is an integral discipline in translation studies, encompasses “the production, translation and organisation” (Schubert, 2009, p. 17) of the text and text components. The definition of technical communication is very similar to that of Markel (2010, p. 4), who describes it as “the process of creating, designing, and communicating technical information so that people can easily understand it and use it safely, effectively, and efficiently.” Technical documents should be clear, accurate, readable and concise and should be written in coherent relationships (Campbell, 1991) to address specific readers so that those specific readers learn or perform a task (Byrne, 2012; Markel, 2010). As Schubert (2009) points out, there are certain internal and external controlling influences at work in the process of translating technical documents. Of course, these factors are so numerous that many of them are beyond the scope of this study.

As technical communicators, technical translators are an essential part of technical communication and their roles include, but are not limited to, translating, editing and illustrating (Byrne, 2012, p. 26) the target text according to the needs of the target audience. Thus, the roles of technical translators can be extended to include re-educating, correcting, revising, deleting and omitting (Krein-Kühle, 2011) addressing the question of how and to what extent specific features are governed and constrained by register aspects. It examines the translation-relevant items have and be when used as main verbs and their German translation solutions, drawing on a theoretical and methodological framework that takes due account of the context, i.e., the domain(s).

The present study is based on the Skopos theory since it genuinely acknowledges the responsibilities, expectations, and obligations of translators as well as the professional reality of translation (Byrne, 2006). The Skopos theory allows for modifications and changes not only in the target text but also in the source text. This notion of Skopos theory overlaps perfectly with that of controlled language, which has the main priority to reduce ambiguity and provide greater consistency and readability in technical documents for the communicative needs of the target readership for which the translation is produced. Source texts are written with the conventions, norms and constraints of the culture in which they are produced. Technical translators are expected to interpret and rewrite the source text (Lefevere, 1992), as the target text is addressed to a new audience with different expectations, cultural backgrounds and even different cognitive developments and perceptions. As with most technical texts, information content and the accuracy of its communication are paramount. Technical translators/communicators can produce a text that is acceptable within the conventions of the target cultures. It is believed that technical translators and communicators should adapt and even rewrite not only verbal features but also non-verbal features such as figures, table background colours and icons in order to produce a text in a comprehensive and communicative sense.

## Research design

### Method

This study is empirical, based on the analysis of the translations of the participants involved in the study. They were the students, who practised on the technical texts before and were willing to work as translators when they graduate. The data were analysed both qualitatively and quantitatively. Prior to the study, the researcher contacted the lecturer who was teaching translation courses. The researcher informed the lecturer about the process of the study as part of the study ethics. Before the translation process started, the participants were informed about the procedure. All participants were informed that the text was a procedural text, that the translation time was 30 minutes, that they could use any dictionary and that the text was being translated for medical professionals. The Standard Technical English Text (STET) and the Controlled Technical English were randomly handed out. The subjects were not told anything about STET or CTET. They were asked to answer the questions attached to the paper after completing the translation task. The researcher also informed the lecturer and the participants that the researcher obtained ethical approval No. 84434274-050.04.04/505114 from the Ethics Committee of Ankara University.

The translation materials consist of two texts accompanied by an illustration: one written in Standard Technical English (STE) and the other in Controlled Technical English (CTE), as well as an instruction sheet and a consent

form for each subject (See Appendix B). The material was taken from the website <https://www.shufrans-tech-docs.com/writing-in-simplified-technical-english/>. This company is an expert in converting documents written in standard technical English into controlled technical English. They allow their documents to be used for critical articles and reviews. STE and CTE are provided in Appendix B.

These two paragraphs provide the same information with different wording and syntax. Some technical words and phrases such as *C-arm*, *the monitor cart*, *panel*, *screen*, and *touch screen* are retained in the CTE. However, certain lexical items (e.g., *always*, *selected*, *enable*, *selected*, *depending on*, *appear*, *press*, *desired*, and *directly*), conjunctions (e.g., both ... and ...), participles (e.g., *enabling*, *depending on*), passives, past participle adjectives and writing style (e.g., long sentences, use of passives, use of participles and explanations in brackets) are compromised in CTE. It would be better to gain insight into certain textual features of two texts to compare them. Prior to the study, the researcher computed some textual features of the text. The result is as follows (Table 1).

**Table 1** Textual features of Standard Technical English and Controlled Technical English Documents

	The number of words	The number of sentences	Lexical density	Flesch reading ease
STE	75	5	60	59.92
CTE	52	6	59.62	67.75

The researcher computed Flesch reading ease and lexical density of the texts to compare and contrast the linguistic features of the texts. Table 1 shows that CTE has fewer words, while their lexical densities are equally same. Reading ease analysis points out that CTE is much easier, which hypothetically allows for a more translatable and comprehensible text for the translators.

### Participants

The research subjects ( $n = 40$ ) for the translation tasks were the students of the English Language and Literature taking translation classes at Ankara University in Turkey. They volunteered to participate in the study. Twenty of them translated the text written in Standard Technical English and twenty of them translated the text written in Controlled Technical English. They were the fourth year students, who took translation courses before and were experienced in technical translation.

### Data collection tool

To evaluate the source texts and the translations, the source texts and the translations were analysed independently, respecting the linguistic and cultural conventions of each language. Certain parts of the translatability scale developed by Spyridakis et al. (1997) were employed to assess the translatability of technical texts. The researcher adapted, updated and elaborated it to meet the needs of the present study, as their study was a source-language-oriented study based on strict equivalence between languages. This current study, however, is strictly target-language oriented. In order to meet the purpose of the present study, the following translation evaluation tool was employed to analyse the translations. In preparing this evaluation form, the researcher benefited from the ideas of his colleagues, whose names are given in the Acknowledgements section.

The main components and subcomponents of the texts were rated on a five-point scale, where 1 is 'strongly disagree' and 5 is 'strongly agree'. *Accuracy* is defined here as how accurately the content and consistency of the source text is conveyed to the target audience. *Style* is limited to the level of language difficulty and the tone of the document. In terms of textual cohesion, the five main cohesive devices outlined by Haliday & Hasan, (1976) were followed. These devices were chosen because they provide links between various parts of a text (Baker, 2018) and enable the text to be more comprehensible and readable for the target audience. *Reference* is used, here, for the relationship that holds between a word and what refers to in real life. In *substitution*, one element is replaced by another; in *ellipsis*, an element is omitted. *Conjunctions* refer to the use of markers such as additive, adversive, casual and temporal to connect related sentences.

**Table 2** Target language-oriented-translation evaluation form

Accuracy	1	2	3	4	5
1. The content is conveyed accurately to the target readers.					
2. The invariance of information is conveyed to the target readers.					
Style					
1. The difficulty of sentences is suitable for target readers.					
2. The tone of the target text addresses the target readers.					
Textual Cohesion					
1. The appropriate use of cohesive devices (reference, substitution, ellipsis, conjunction) makes the text comprehensible to the target readers.					
2. The appropriate use of lexical cohesion makes the text comprehensible to the target readers.					

The participants were also asked to answer the questions attached to the paper after completing the translation task. These questions were as follows:

The text is translatable.	1	2	3	4	5
The visual(s) helps me translate the text easily.	1	2	3	4	5
I believe that I have produced a text acceptable in the target language.	1	2	3	4	5

The participants were requested to rate on a five-point scale with 1 equal to highly *disagree* and 5 equals to *highly agree*.

### Data analysis

In-depth statistical and content analyses were carried out on the data collected from the participants. To evaluate the participants' reflections on the text they translated, the Mann-Whitney test was conducted. Each translation was carefully analysed qualitatively and quantitatively, and the data were sorted and scored in terms of *accuracy*, *style*, and *textual cohesion*. The scores regarding the translations of Standard Technical English and Controlled Technical English were compared through the Mann-Whitney Test.

### Findings

The participants' personal comments on the texts they translated are provided in Table 3.

The data showed that 15 out of 20 participants who translated STE considered the text they translated to be translatable, whereas 17 participants who translated CTE considered the text they translated to be translatable. The Mann-Whitney U test, which is used to compare whether there is a difference in the dependent variable for two independent groups, statistically proves that with a value of 0.828 ( $p > 0.5$ ) there is no significant difference between two groups, which means that two groups consider the texts in Standard Technical English and in Controlled Technical English to be translatable. The statistical data on the effect of visuals show that approximately the same number of subjects considered the effect to be negligible. With 0.989 ( $p > 0.5$ ) there was no significant difference between the groups. The statistical data for question 3 showed participants who translated STE, 12 participants believed that they had produced an acceptable text in the target language. Similarly, 13 participants who translated CTE felt that they had produced an acceptable text in the target language. As in the first two questions, no significant difference was found between the groups with a value of 0.792 ( $p > 0.5$ ).

In total, three sets of questions were prepared to measure the participants' evaluation of STE and CTE. The statistical data showed that the participants in both groups, who translated the texts in STE and CTE, concluded

that both texts were translatable as well as thinking that the texts they had produced were acceptable. They also concluded that the visuals did not help them to translate the text easily.

**Table 3** Quantitative findings regarding participants' own reflections on the texts they produced

	Standard Technical English		Controlled Technical English		Mann-Whitney Test		
	Count	Column N %	Count	Column N %	Mann-Whitney U	Asymp. Sig. (2-tailed)	
1. The text is translatable.	1	0	0%	0	0%	192.5	0.828
	2	2	10%	0	0%		
	3	3	15%	3	15%		
	4	7	35%	10	50%		
	5	8	40%	7	35%		
2. The visual(s) help me to translate the text easily.	1	3	15%	4	20%	199.5	0.989
	2	7	35%	7	35%		
	3	5	25%	2	10%		
	4	3	15%	4	20%		
	5	2	10%	3	15%		
3. I believe that I have produced a text acceptable in the target language	1	0	0%	0	0%	191	0.792
	2	3	15%	1	5%		
	3	5	25%	6	30%		
	4	9	45%	11	55%		
	5	3	15%	2	10%		

The participants' self-assessment of STE and CTE was found to be inconsistent with the current literature, which promotes controlled language for higher translatability. However, the data and findings are limited to the comments made by the participants. A more comprehensive and text-based analysis by the researcher is presented in Table 5. The participants' translations were analysed in terms of accuracy, style and textual cohesion. The results and statistical analysis are presented in Table 4.

**Table 4** The statistical analysis of Standard and Technical English as to translatability through the norms of the target language for the relevant text type

	Standard Technical English		Controlled Technical English		Mann-Whitney Test		
	Count	Column N %	Count	Column N %	Mann-Whitney U	Asymp. Sig. (2-tailed)	
<b>Accuracy</b>							
1. The content is conveyed accurately to the target readers.	1	4	20%	1	5%	46	0
	2	9	45%	0	0%		
	3	7	35%	8	40%		
	4	0	0%	10	50%		
	5	0	0%	1	5%		



	Standard Technical English		Controlled Technical English		Mann-Whitney Test		
	Count	Column N %	Count	Column N %	Mann-Whitney U	Asymp. Sig. (2-tailed)	
2. The invariance of information is conveyed to the target readers.	1	4	20%	1	5%	46	0
	2	9	45%	0	0%		
	3	7	35%	8	40%		
	4	0	0%	10	50%		
	5	0	0%	1	5%		
<b>Style</b>							
1. The difficulty of sentences is suitable to target readers.	1	6	30%	0	0%	74.5	0
	2	7	35%	4	20%		
	3	6	30%	7	35%		
	4	1	5%	9	45%		
2. The tone of the target text addresses the target readers.	1	6	30%	0	0%	68	0
	2	8	40%	5	25%		
	3	6	30%	6	30%		
	4	0	0%	9	45%		
<b>Textual Cohesion</b>							
1. The appropriate use of cohesive devices (reference, substitution, ellipsis, conjunction) makes the text comprehensible to the target readers.	1	6	30%	0	0%	65.5	0
	2	5	25%	1	5%		
	3	9	45%	12	60%		
	4	0	0%	7	35%		
2. The appropriate use of lexical cohesion makes the text comprehensible to the target readers.	1	6	30%	0	0%	52.5	0
	2	7	35%	1	5%		
	3	7	35%	12	60%		
	4	0	0%	7	35%		

### Accuracy

In the present study, *accuracy* was investigated under two headings: *content* and *invariability* of information. When the translations of STE and CTE were analysed in terms of *accuracy*, it was found that 11 participants were able to convey *content* accurately in CTE, whereas no participant was able to convey *content* accurately in STE. The data showed that the responses on the rating scale for CTE were skewed towards *high agreement*. On the other hand, the responses on the STE rating scale were skewed towards *strongly disagreeing*. Similarly,

the same number of participants were able to convey the invariance of content. As in the case of content, the responses for CTE were skewed towards *high agreement*. On the other hand, the responses on the STE rating scale were skewed towards *strongly disagree*. The difference between the groups was found to be significant at 0.000 ( $p < 0.5$ ). One of the most important functions of technical translation is the accurate dissemination of information (Pinchuck, 1977), the data showed that the CTE translations achieved this purpose.

The translations of STE failed to convey information to the target audience accurately. The text explains how medical equipment works. The main purpose of the text is to communicate the given information to the target readers, in this case, medical professionals. We understand from the text that the equipment consists of two main parts: a *C-arm stand*, and a *monitor* being connected to a *control panel*. The two *control panels* have the *same screen*, which makes it easier to use. The *control panel* has a *touch screen* that works by touch. Participants are expected to accurately convey the given information to the target audience. In the case of STE, participants most often misunderstood the first sentence. They thought that both the *C-arm stand* and the *monitor cart* had a common control panel. The most obvious reason for this ambiguity is the participants' literal translation habit and their adherence to the source text. Some examples of how participants failed to convey the above information.

**Ex 5a** *Hem C şeklindeki kol standı, hemde ekran bölümü bir kontrol paneline sahiptir. (TT1)<sup>1</sup>*

**Ex 5b** *Both arm stand in C shape and monitor section have a control panel. (BT1)<sup>2</sup>*

**Ex 6a** *Hem C-kolu standı hem de mönitör arabasının kontrol paneli var. (TT2)*

**Ex 6b** *Both C-arm stand and monitor cart have control car. (BT2)*

**Ex 7a** *Hem C-kol standı hem de ekran kontrol paneline sahiptir. (TT3)*

**Ex 7b** *Both C-arm stand, and the monitor have the control panel. (BT3)*

These examples showed that terms such as the *C-arm stand* and *monitor cart* were not accurately translated into the target language. In addition, the information that the *C-arm stand* and *monitor* have their *own control panels* was not translated into the target language. In contrast, in CTE, this information was accurately translated into the target language, although in some cases the term *monitor cart* was not translated accurately, as shown in the following examples.

**Ex 8a** *C-kol standı ve mönitör arabasının her birinde kontrol paneli ekranı bulunur. (TT1)*

**Ex 8b** *There is a control panel screen in each C-arm stand and monitor cart. (BT1)*

**Ex 9a** *C kol ayaklığının ve mönitör arabasının her birinde kontrol ekranı vardır. (TT2)*

**Ex 9b** *There is a control panel screen in each C-arm stand and monitor cart. (BT2)*

The excerpts showed that, compared with STE, participants in CTE conveyed the information accurately. However, as in the case of STE, the phrase *monitor cart* was also misinterpreted in CTE.

### Style

Style is a distinctive feature of technical writing, which is characterised by a concise, precise and well-organised style of writing to convey information to the target audience as it directly affects the reader. In technical communication and translation, wordy phrases, vague and hedging language make it impossible for the target readers to understand the information. Style is the channel through which information passes. The data showed that both STE and CTE did not reach an acceptable standard in terms of style, although a statistical difference was

<sup>1</sup> Target Text

<sup>2</sup> Back Translation

found between the groups in favour of CTE ( $p < 0.5$ ). This significant difference proved that the translations in CTE were simpler and more appropriate to the target audience than those in Standard Technical English.

### Textual cohesion

In this current study, textual cohesion was analysed in two main subtitles: cohesive devices and lexical cohesion. In terms of the appropriate use of cohesive devices, the data showed that there was a significant difference between CTE and STE ( $p < 0.5$ ). However, even in CTE, appropriate cohesive devices were not employed at a satisfactory level, as participants still used literal translation strategies, overlooking the fact that they were producing a text for new readers. For example, words such as *These screens* and *each panel* have referents in the previous sentence. They were translated literally:

**Ex 10**     *These screens*     *Bu ekranlar (These screens)*

**Ex 11**     *Each panel*     *Her bir panel (Each panel)*

As the controlled language excludes conjunctions, the participants did not use conjunctions in their translations. However, if they had used conjunctions, the translations would have been more comprehensible, more readable and, more importantly, more natural. In terms of lexical cohesion, there was a significant difference between the two groups in favour of CTE ( $p < 0.5$ ). In both texts, the selection of words and phrases such as *C-arm*, *monitor cart*, *control panel*, *screen*, *touch screen* and *button* are presented in such a way that they organise a relationship in the text. In CTE this relationship is more obvious.

### Discussion

Translation – the written transformation of information across languages – is perhaps “the most visible and recognised aspect of multilingual technical and professional communication” (Gonzales, 2022, p. 3). As a communicator between the source text and the target audience, the translator acts in a sense as a technical writer. He or she rewrites the source text according to the expectations of the new readers.

In the past, strict one-to-one equivalence between texts was desirable, and even the degree of equivalence was considered a measure of quality. Today, equivalence is no longer seen as a static value between texts. Rather, in terms of technical communication, the highest quality translation is the one that conveys the message and information of the source text while respecting “the norms of the target language for the relevant text type or genre” (Maylath et al., 2013, p. 73). In the relevant literature, there is a globally accepted hypothesis that a technical text written in CTE is superior to the standard technical language. Some pioneering researchers such as Cadwell (2008), Holmback et al. (1996), Huijsen (1998), Kamprath et al. (1998), Marzouk (2021), Mogensen (2004), Nyberg and Mitamura (1996), O’Brien (2010), Reuther (2003), Rodríguez Vázquez (2015), Shubert et al. (1995), Spyridakis et al. (1997) have theoretically discussed the difference between CTE and STE and almost unanimously concluded that CTE provides readability, comprehensibility and translatability. However, there was a lack of experimental research to prove these assumptions. This study aimed to fill that gap partially. Although this study bears some resemblance to that of Spyridakis et al. (1997), it is quite different in terms of their approaches to translation. This current study did not seek linguistic equivalence between the source and target texts, since the days when translators were “primarily concerned with fidelity to a source text” (Eubanks, 1998) are gone.

This study produced some interesting and yet contradictory results. The data were analysed from the perspective of the participants and the researcher. In particular, the findings regarding the participants’ own reflections on the source text and the texts they produced were at odds with the existing literature. Participants in both groups claimed that the text they translated was translatable. This finding was provocative as other studies mentioned above theoretically assume that the controlled technical terms are more translatable. Similarly, participants in both groups agreed that the visuals accompanying the texts were not helpful in the translation process. This finding was surprising as any illustration accompanying a text helps scientists, engineers and translators to conceptualise ideas. In fact, (Kim, 2006) stressed that in addition to linguistic knowledge, extensive use of ex-

tra-linguistic knowledge enables successful translation. The reason why the participants did not find the visuals helpful may be that they were not familiar with technical texts.

The questionnaire also showed that, regardless of the group, they agreed that they had produced an acceptable text in Turkish. However, the impartial analysis gave different results from the participants' own insights. When the researcher analysed the texts produced, it was found out that many participants, regardless of the group, still resorted to literal translations and calques when transferring technical words and phrases. These literal translations and calques are acceptable in Turkish. Some striking examples are given below.

	<b>Word/phrases</b>	<b>Translation</b>	<b>Back translation</b>
<b>Ex 12</b>	<i>C-arm</i>	<i>C-kolu</i>	<i>C-arm</i>
<b>Ex 13</b>	<i>Control panel</i>	<i>kontrol paneli</i>	<i>Control panel</i>
<b>Ex 14</b>	<i>Touch screen</i>	<i>dokunmatik ekran</i>	<i>touch screen</i>

The results were analysed to determine which translations produced from CTE and STE are acceptable within the norms of the target language for each type of text. The analysis is based on the norms of the target culture, unlike previous studies, because I believe, like (Larson, 1987, p. 69), that “the goal of most translators is to produce translations that are acceptable to the audiences for whom the translations are produced.” The results showed that, in terms of accuracy, CTE resulted in more accurate texts in the target language. Sentences are less ambiguous. The reason for this lies in the fact that conjunctions (e.g., both /and), use of participles (e.g. enabling, depending on), use of passive and past participle adjectives and style (e.g. long sentences, use of passives, use of participles and explanations in brackets) were compromised in CTE, resulting in less ambiguous and more accurate texts in the target language.

In terms of textual cohesion, a significant difference was found between the translations of CTE and STE in favour of CTE. However, it was observed that due to the relentless efforts of the participants in both groups not to deviate from the norms of the source language, the texts produced were rated as unsatisfactory in terms of cohesion. Cohesion allows the text to flow smoothly. In STE and CTE, however, little space was devoted to cohesion markers. The relative superiority of CTE lies in the fact that it lacked some devices that could lead to ambiguity. Some examples are given below:

**Ex 15a** *Both the C-arm stand, and the monitor cart have a control panel.*

**Ex 15b** *The two control panels always show the same screen enabling you to use them for system operation.*

**Ex 16a** *The C-arm stand and the monitor cart each have a control panel screen.*

**Ex 16b** *These screens show the same control panel. Each panel lets you operate the system.*

The technical writer makes it clear in the first sentence that the *C-arms stand*, and *the monitor cart* have their own separate control panel screen. In the first sentence of STE this fact is a bit ambiguous, and we cannot have this information until we read the second sentence. Also, the use of participle *enabling* makes the sentence unclear, as what enables us to use the system: the two-control panel; or the fact that they show the same screen remains unclear. Likewise, the reference *them* is a bit problematic as what it refers to is not clear: does it refer to *the two control panels* or *the two control panels and the same screen*? On the other hand, in CTE, the technical writers use the referents properly (e.g., each instead of both/and these screens) and omit the referents as they cause ambiguity. The ambiguous nature of STL was carried into the target text as participants resorted to literal translation, which resulted in more ambiguous texts in the target language. Some cases are exemplified as follows:

**Ex 17a** *The two control panels always show the same screen enabling you to use them for system operation. (ST)*

**Ex 17b** *İki control panelide aynı ekranı göstererek system operasyonu için kullanmamızı sağlıyor. (TT)*

- Ex 18a** *The two control panels enables us to use for system operation by showing the same screen. (BT)*
- Ex 18b** *Panel de aynı ekranı göstermektedir. Bu da ekranları sistem kontrollü için kullanabilmenizi sağlamaktadır. (TT2) → The panel show the same screen. This enables you to use the screen for system control. (BT)*

In Ex 18, the translator split the sentence. However, he/she failed to translate the meaning into Turkish. These examples showed that the participants' relentless obsession with literal translation, coupled with their misunderstanding of the source text, resulted in ambiguous texts. They produced texts that were incomprehensible to the target audience.

The above brief but striking examples have shown that, particularly in STE, some of cohesive devices created certain difficulties in understanding and translating the meaning into the target language. As Campbell (1991) pointed out, meaning is involved in cohesive relations. Unfortunately, on many occasions the participants failed to produce a cohesive text, especially in the translation of STE. Translators should keep in mind that, as Dam-Jensen & Heine (2013) suggested, translation is a kind of text writing and they have to produce a cohesive text for a target audience. It is the translator's duty to find the right register for the text (Kingscott, 2002).

## Conclusion

Overall, the study aimed to test the hypothesis that controlled technical English makes the source text translatable and that translators can produce acceptable texts in the norms of the target language for the respective text type. Theoretically, CTE is more translatable than STE. However, the findings showed that the participants regarded both texts translatable. In terms of accuracy, the participants produced more accurate texts in the context of CTE. Similarly, In terms of style and textual cohesion, the participants produced texts which are appropriate for the target Turkish readers. This experimental study partially proved this hypothesis between the language pair English and Turkish, as the texts produced from CTE were found to be better than STE texts in terms of accuracy, style and textual cohesion. Although CTE translations were found to be statistically better than STE translations, both had some inherent problems, mainly due to the participants' obsession with the literal translation tendency, overlooking the fact that they are producing a text for new users who are completely different from the readers of the original text. However, modern translation theories allow the translators to translate any text, considering the expectations and needs of the target audience rather than strictly being loyal to the source text.

## Limitations and suggestions

There are a number of limitations to this study. The first limitation is that it was conducted for one language pair. Another limitation is the limited scope of the study. However, this study provided some important data and implications for other researchers and technical translators. The other limitation is the number of subjects. One of the implications is that technical translators should act as technical communicators who enable and facilitate communication between the source text and the target audience. As technical communicators, translators should not forget that the end-user will probably not study the translation as a translation but as an original text in the target language. They should therefore never forget that they are presenting new information to a new reader, not reproducing the source text. Technical translators should therefore respect the linguistic and extralinguistic norms of the target readers, as technical translation is more than just the transfer of information. The study also has some implications for companies. They should employ translators and technical writers who can act as technical communicators.

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## Conflict of Interest

The author declares no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Appendix A

General rules of writing technical documents through controlled language (based on ASD-STE100, 2021)

	Words	Sentence	Procedural writing	Descriptive writing
Words	<ol style="list-style-type: none"> <li>1. Use approved words in the dictionary.</li> <li>2. Use words with technical names.</li> </ol>	<ol style="list-style-type: none"> <li>1. Write short and clear sentences.</li> <li>2. Do not omit words or use contractions to make your sentences shorter.</li> <li>3. Use a vertical list for complex texts.</li> <li>4. Use connecting words and phrases to connect sentences that contain related topics.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use a maximum of 20 words in each sentence.</li> <li>2. Write only one instruction in each sentence.</li> <li>3. Write instructions in the imperative</li> <li>4. If you start an instruction with a descriptive statement (dependent phrase or clause), divide that statement from the command with a comma.</li> <li>5. If you start an instruction with a descriptive statement, divide that statement from the command with a comma.</li> <li>6. Write notes only to give information and not instructions.</li> </ol>	<ol style="list-style-type: none"> <li>1. Give information gradually.</li> <li>2. Use key words and phrases to organize your text logically.</li> <li>3. Write short sentences. Use a maximum of 25 words in each sentence.</li> <li>4. Use paragraphs to show related information.</li> <li>5. Make sure that each paragraph has only one topic.</li> <li>6. Make sure that no paragraph has more than six sentences.</li> </ol>
Part of Speech	<ol style="list-style-type: none"> <li>1. Use approved word from the dictionary only as a part of speech given.</li> </ol>			
Approved meaning	<ol style="list-style-type: none"> <li>1. Use approved words with only approved meaning.</li> </ol>			
Verbs and Adjectives	<ol style="list-style-type: none"> <li>1. Use only approved forms of verbs and adjectives.</li> </ol>			
Technical names	<ol style="list-style-type: none"> <li>1. Use a word included in the technical name category.</li> <li>2. Do not use words with technical names as verbs.</li> <li>3. Use technical names consistent with approved nomenclature.</li> <li>4. Use a technical word that is short and easy to understand.</li> <li>5. Do not use jargon or slang.</li> <li>6. Do not use different technical names for the same item.</li> </ol>			
Technical verbs	<ol style="list-style-type: none"> <li>1. Use words included in a technical verb category.</li> </ol>			
Spelling	<ol style="list-style-type: none"> <li>1. Use American English spelling only.</li> </ol>			

## STE

### Appendix B

**Control Panel:** <sup>1</sup>Both the C-arm stand, and the monitor cart have a control panel. <sup>2</sup>The two control panels always show the same screen enabling you to use them for system operation.

<sup>3</sup>Depending on the selected function, other controls (buttons, input boxes, displays, etc.) will appear on the control panel screen. <sup>4</sup>The Vision Center control panel is designed as a touch screen. <sup>5</sup>For system operation, just press the desired button or option directly on the touch screen.

## CTE

**Control Panel:** <sup>1</sup>The C-arm stand and the monitor cart each have a control panel screen. <sup>2</sup>These screens show the same control panel. <sup>3</sup>Each panel lets you operate the system. <sup>4</sup>The panels have different controls for different functions. <sup>5</sup>The control panel is a touch screen. <sup>6</sup>To operate the system, touch the correct button or option.

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## Santrauka

### Alpaslan Acar

Kontroliuojamos anglų kalbos poveikio techninių tekstų vertimui iš anglų kalbos į turkų kalbą lyginamasis tyrimas

Kontroliuojama, suspaprastinta kalba, kaip natūralios kalbos porūšis, reiškia ribotą arba standartizuotą leksikos, gramatikos ir stiliaus vartojimą. Buvo iškelta hipotezė, kad vartojant kontroliuojamąją kalbą techniniai tekstai tampa lengviau išverčiami, taigi ir suprantamesni. Šiame straipsnyje pateikiami eksperimentinio tyrimo, skirto šiai hipotezei patikrinti, rezultatai. Siekdami patikrinti hipotezę, 40 dalyvių vertė kontroliuojama technine kalba ir standartine technine kalba parašytą tekstą. Dalyviai nepastebėjo jokio skirtumo tarp abiejų tekstų vertimo galimybių. Tekstai buvo analizuojami kokybiškai ir kiekybiškai. Tikslumu, kalbos stiliumi ir teksto rišlumu išversti tekstai pasirodė tinkamesni, kai techninė kalba kontroliuojama. Tačiau taip pat paaiškėjo, kad dalyviai, versdami bet kokio tipo tekstą, vis tiek yra ištikimi pirminiam tekstui, nepaisant to, kad verčia naujai auditorijai. Apibendrinant galima teigti, kad rezultatai parodė, jog kontroliuojama techninė kalba pagerino techninių dokumentų supratimą ir vertimą tikslumo, stiliaus ir teksto kokybės požiūriu. Tyrime siūloma tarptautinėms įmonėms samdyti techninių tekstų rašytojus ir vertėjus, kurie pirmenybę teiktų tikslinės auditorijos kalbai ir ekstralingvistinėms normoms, o ne akiai laikytusi originalo teksto.

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