

# TRANSLATING *THAT*: AN IDEATIONAL CORRESPONDENCE ANALYSIS OF MACHINE TRANSLATION

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## Abstrak

Penelitian ini bertujuan untuk membandingkan hasil terjemahan dua mesin terjemahan, yakni *Google Translate* dan *Bing Translator*, dalam menerjemahkan leksem *that* pada artikel berita. Pendekatan yang digunakan dalam menelaah kesejajaran hasil terjemahan dari leksem *that* pada penelitian ini adalah linguistik sistemik fungsional, khususnya pada struktur eksperiensial dan logis. Jenis analisis yang digunakan adalah komparatif deskriptif. Data yang digunakan meliputi 40 satuan kebahasaan dari leksem *that* yang diambil dari enam artikel Berita Dunia BBC. Hasil temuan menunjukkan bahwa dua mesin terjemahan mampu mengenali tiga fungsi leksem *that*, yakni fungsi inti (*Head*), fungsi *post-modifier*, dan fungsi konjungsi. Fungsi terbanyak yang ditemukan adalah fungsi *post-modifier* (19 kali atau 47,5%), yang diikuti dengan fungsi konjungsi (17 kali atau 42,5% pada mesin pertama dan 18 kali atau 45% pada mesin kedua). Fungsi inti menjadi fungsi terakhir setelah kedua fungsi lainnya (empat kali atau 10% pada mesin pertama dan tiga kali atau 7,5% pada mesin kedua). Lebih lanjut, dikarenakan adanya variasi elipsis dari leksem *that* sebagai pronomina relatif dan *post-determiner* pada mesin terjemahan pertama, penelitian ini menyimpulkan bahwa hasil terjemahan mesin pertama lebih akurat, berterima, kreatif, dan kontekstual daripada hasil terjemahan mesin kedua.

**Kata kunci:** Linguistik Sistemik Fungsional; Struktur Eksperiensial; Struktur Logis

## Abstract

This paper aims to contrast the translation of two machine translation systems, Google Translate and Bing Translator, in translating the lexeme in news articles. The approach used in scrutinizing the lexeme's translation correspondence in this study is systemic functional linguistics, especially in both experiential and logical structures. This study was carried out through descriptive comparative analysis. This study's data were 40 constituents that were taken from six BBC World news articles randomly selected. A thorough analysis demonstrates that the two machine translation systems can recognize the three functions of that, i.e., Head, post-modifier, and conjunction. The highest emerging function is post-modifier by 19 times (47.5%), followed by the conjunction function by 17 times (42.5%) on the first machine translation system and 18 times (45%) on the second one. The lowest emerging function is Head by four times (10%) on the first machine translation system and three times (7.5%) on the second one. Furthermore, due to the elliptical variation of that as a relative pronoun and the translation variation of that as a post-determiner, it concludes that the translation outputs of Google Translate are more accurate, semantically acceptable, creative, and contextual than those of Bing Translator.

**Keywords:** Experiential Structure; Logical Structure; Systemic Functional Linguistics

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## INTRODUCTION

Translation, nowadays, does not merely involve the manual translation process by a human translator; further, following the global information technology trends, translation has begun to enter a new era, i.e., the digital translation era. In the last several decades, digital translation started getting notable attention in translation studies. In general, there are numerous experts acceding that the digital translation consists of two central classifications, *computer-assisted translation* and *machine translation* (Hartley, 2009; Williams & Chesterman, 2002). According to Munday (2016), the distinctive features of these two classifications reside in the process and the intended use. The computer-assisted translation rather highlights the assistance process in facilitating, accelerating, and easing the series of translation processes carried out by a human translator, ranging from the pre-translation to post-translation process. Whilst, the machine translation is increasingly used in the initial information-distributing process, which in this case refers to the preliminary draft composition (often undertaken by the European Commission). It aims at triggering varied inputs or feedbacks for further reviews, editing, and proofreading by professional translators.

Machine translation is an automated and independence computational system to translate a text (Ahangar et al., 2012). This automated computational system was then developed so as to further facilitate the process of translating one language to another in the absence of any human assistance. During its development over the past fifty years, automatic machine translation has been enhanced and refined through numerous paradigms, including dictionary-based machine translation, example-based machine translation, and rule-based machine translation (Pilevar & Faili, 2010). Inevitably, each type has its own advantages and drawbacks.

Several studies have evinced that despite its incredibly rapid progress, rule-based machine translation seemingly still encounters a number of difficulties in translating various languages. Putri and Ardi (2015), for instance, demonstrated that the rule/statistic-based machine translation, i.e. *Google Translate* (GT), faced varied difficulties in translating folklore texts from Indonesian language to English, such as 1) inequivalent/incorrect and omitted diction, 2) errors in the word, phrase, even sentence structure, and 3) errors in translating unknown words or *realia*. In accord with these findings, Ismail and Hartono (2016) in their study showed that GT also encountered many difficulties in translating news articles from Indonesian language to English. The major difficulties found in the study were mainly related to grammatical and terminological errors—apart from other errors, e.g., the ambiguity creation, and punctuation and capitalization errors. It also concluded that the difficulties occurred due to varied factors, including the lack of machine ability to recognize the context of the text provided (bearing in mind that GT is mainly based on statistics/rules), and the machine incapability of identifying errors existed in the source texts and consequently created errors in the target texts.

However, despite those difficulties and errors, recently due to the current Neural Machine Translation (NMT) system, both GT and Bing Translator (BT) generated outstanding results (> 90% accuracy) pertaining to the orthography and grammar and good ones on the lexical and grammatical collocations (79.8% for GT and 74.5% for BT) in translating journalistic texts (Almahasees, 2018). Similar to this findings, Achmad (2016) also pointed out that the translation quality of GT is better than that of BT as regards scientific texts.

Although several studies mentioned have investigated errors occurred in machine translation outputs, to some extent there has not been yet any studies contrasting the outputs of two machine translation systems, particularly focusing on the lexeme *that*. I assume that due to the use of a distinct corpora database, one machine translation system will produce different outputs contrasted with another one. Therefore, this paper strives to scrutinize how such contrast is actualized in the outputs of these two machine translation systems. The rationale behind the selection of GT and BT in this study was due to their well-known good quality (Achmad, 2016; Almahasees, 2018) and their popularity throughout the world (Precup-Stiegelbauer, 2013). The contrastive analysis incorporates two shift aspects, i.e. the structural shift and the syntactical function shift, especially on the

ideational structure<sup>1</sup> (cf. Dwijatmoko, 2019, who used three metafunctions in his analysis).

In analyzing both syntactical structure and function, Halliday and Matthiessen (2014) proposed two main structures, namely experiential structure and logical structure of each constituent. The experiential structure refers to the element of *THING* in each constituent class; meanwhile, the logical structure refers to the element of how the logic of the constituent classes works in the larger construction. The experiential structure in a noun phrase, for instance, is classified into four categories, i.e., *deictic*, *numerative*, *epithet*, and *classifier*. Whereas, the logical structure is merely classified into two categories, namely *pre-modifier* and *post-modifier*. For further details regarding these two structures, it can be seen in the Table 1.

Table 1. Experiential and Logical Structures of Noun Phrase (1)  
Modified from Halliday (Ibid.)

(1) *Those two-splendid old electric trains with pantographs*

pre-modifier				Head	post-modifier		
<i>those</i>	<i>two</i>	<i>splendid</i>	<i>old</i>	<i>electric</i>	<b><i>trains</i></b>	<i>with</i>	<i>pantographs</i>
deictic	numerative	epithet		classifier	Thing	qualifier	
		attitude	quality				
determiner	numeral	adjective	adjective	adjective	noun	prepositional phrase	
						preposition	noun
						head	thing

As illustrated in Table 1, these experiential and logical structures merely represent the syntactical slots wherein the realization of each slot can be filled by various constituents. Therefore, it can be said that a constituent, whether it is in the form of word, compound word, or even phrase, can fill each categorical slot freely or flexibly. In regard to this, it is highly possible for the lexeme *that* to play a role or fill distinct categories depending on the function

preferred. Perceived from its logical structure category, the lexeme *that* can occupy three categories, i.e., as a pre-modifier, as a Head, and as a post-modifier, as well as one function as a conjunction.

1. *That* as a Pre-modifier

The lexeme *that* as a pre-modifier is realized in the form of demonstrative determiner, functioning as a deictic. Demonstrative in this context indicates two aspects, namely

1) proximity or distance, that is far from the collocutor; and 2) quantity, that is singular. Furthermore, the determiner in this example also functions as a

deictic, in that it attributes the definiteness on the noun Head (Thing). The detailed elaboration on this can be seen in Table 2.

Table 2. That as a Pre-modifier

(2) *That man under the tree is my brother*

pre-modifier	<b>Head</b>	post-modifier		
<i>that</i>	<b>man</b>	<i>under</i>	<i>the</i>	<i>tree</i>
deictic	Thing	qualifier		
demonstrative determiner	noun	prepositional phrase		
		preposition	noun phrase	
		Head	Thing	
			determiner	noun

2. *That* as a Head

Apart from being a pre-modifier, the lexeme *that* can function as a Head in either subject or object of a sentence. Due to its function as a

Head, this constituent thus can independently exist without other constituents to modify it. Table 3 below illustrates *that* as a Head in either subject or object of a sentence.

Table 3. *That* as a Head

Subject	<b><i>That</i></b> <i>is the problem we should face.</i>
Object	<i>I do not eat <b>that</b></i>

3. *That* as a Post-modifier

The third function of the lexeme *that* is as a post-modifier of a noun Head in the form of relative pronoun (as a qualifier) used to initiate a relative clause. In its realization, the

lexeme *that* is not necessarily required (rather, optional), and ergo can be omitted if necessary. The following examples, sentence (3) and (3a), demonstrate *that* as a post-modifier.

Table 4. *That* as a post-modifier

*The cat **that** ate your fish came to me last night*  
 (3a) *The cat eating your fish came to me last night*

pre-modifier	<b>Head</b>	post-modifier		
<i>the</i>	<b>cat</b>	<i>that</i>	<i>ate</i>	<i>your fish</i>
deictic	Thing	qualifier		
determiner	noun	relative pronoun	verb	noun phrase
			possessive determiner	noun

4. *That as a Conjunction*

Last, the lexeme *that* can also function as a conjunction to introduce a

subordinate clause, whether as a noun clause (subject-object) or as a complement clause.

Table 5. *That* as a post-modifier

Noun Clause	
Subject	<i><b>That</b> he always loves you is the fact you cannot deny</i>
Object	<i>I know <b>that</b> he always loves you</i>
Complement Clause	
Subject	<i>The fact is <b>that</b> he always loves you</i>
	<i>I am sure <b>that</b> he always loves you</i>

This study aimed at scrutinizing the ideational structures of the lexeme *that* in the two machine translation systems. The analysis was carried out by contrasting, therefore finding out the similarities and differences, the experiential structure and logical structure of those lexemes. It was specifically focused on two aspects, i.e., function and category of the lexeme *that*. This study, moreover, was expected to be of beneficiary for describing how the lexeme *that* was translated into the two machine translation systems and to what extent the translation outputs were corresponded to the originals in terms of both function and category in the experiential and logical structures.

**METHODS**

This study is a contrastive analysis focusing on two major axes, i.e., similarities and differences of the translation of two machine translation systems in translating the lexeme *that*. The machine translation systems used were *Google Translate* and

*Bing Translator*. These two systems were selected on the grounds that both are the most popular machine translation systems that are frequently used worldwide (Precup-Stiegelbauer, 2013). The data were retrieved from the global news channel, that is *BBC News*, consisting of six news articles randomly selected. The data of this study comprised forty constituents *that* in English (Source Text) and the translation in Indonesian language (Target Text). The data analysis was carried out in two stages: 1) the percentage calculation of each function and category of the lexeme *that* in both machine translation systems; 2) the elaboration of contrastive analysis (similarities and differences) of the translation.

**FINDINGS AND DISCUSSION**

Based on the translation of the two machine translation systems, i.e., *Google Translate* (GT) and *Bing Translator* (BT), each function and category of the lexeme *that* is thoroughly elaborated in the Table 6.

Table 6. The overview of function and category in *Google Translate*

System	Function	Category	Percentage	
			Partial	Total
Google Translate (GT)	Head	pronoun (beginilah)	1 (2.5%)	4 (10%)
		pronoun (itulah)	1 (2.5%)	
		pronoun (itu)	2 (5%)	

	Post-modifier	adverb (sebelumnya)	1 (2.5%)	19 (47.5%)
		phrase (seperti itu)	1 (2.5%)	
		phrase (dari itu)	1 (2.5%)	
		pronoun (yang)	10 (25%)	
		pronoun (yang itu)	1 (2.5%)	
	determiner (itu)	5 (12.5%)		
Conjunction	particle (bahwa)	15 (37.5%)	17 (42.5%)	
	∅ (bahwa)	2 (5%)		
<b>Total</b>				<b>40 (100%)</b>

Table 7. The overview of function and category in *Bing Translator*

System	Function	Category	Percentage	
			Partial	Total
Bing Translator (BT)	Head	pronoun (itulah)	2 (5%)	3 (7.5%)
		pronoun (itu)	1 (2.5%)	
	Post-modifier	adverb (sebelum itu)	1 (2.5%)	19 (47.5%)
		phrase (seperti itu)	1 (2.5%)	
phrase (dari itu)		1 (2.5%)		
pronoun (yang)		10 (25%)		
	pronoun (yang satu)	1 (2.5%)		
	determiner (itu)	5 (12.5%)		
	Conjunction	particle (bahwa)		18 (45%)
<b>Total</b>				<b>40 (100%)</b>

From the table 6 and 7 above, it can be seen that the most frequently occurring function of the lexeme *that* was as post-modifier (19 times or 47.5% in each machine translation system). On the first machine, such function of post-modifier was distributed in the form of the adverb *sebelumnya* (previously) once (2.5%), the phrase *seperti itu* (such that) once (2.5%), the phrase *dari itu* (of which) once (2.5%), the relative pronoun *yang* (that) by ten times (25%), the demonstrative relative pronoun *yang itu* (that one) once (2.5%), and the deictic determiner *itu* (that) by five times (12.5%). Meanwhile on the second machine, it was distributed in the form of the adverb *sebelum itu* (prior to that) once (2.5%), the phrase *seperti itu* (such that) once (2.5%), the phrase *dari itu* (of which) once (2.5%), the relative pronoun *yang* (that) by ten times (25%), the relative pronoun *yang satu* (that one) once (2.5%),

and the deictic determiner *itu* (that) by five times (12.5%). The difference of these two machines relied on the adverbs *sebelumnya* – *sebelum itu* (previously and prior to that) and relative pronouns *yang itu* – *yang satu* (both mean that one). Furthermore, the second most occurring function was as conjunction, realized in the form of the Indonesian particle *bahwa* (that). On the first machine, this function of conjunction occurred 17 times (42.5%) distributed into two, i.e., the Indonesian particle *bahwa* (that) by 15 times (37.5%) and ∅ twice (5%); whereas, on the second machine, it occurred 18 times (45%). The function of *Head* occurred in the third place, in the form of the pronoun *begitulah* (that so) and *itulah* (that) by four times (10%) in the first machine and in the form of the pronoun *itulah* (that) by three times (7.5%) in the second one.

### Similarities of the Two Machine Translation Systems

#### 1. *That* as a Head

The two machines generated the similar translation as to the function of *that* as a Head. Both put the pronoun *that* as the Head of the subject of the sentence.

*That's barely enough money to pay the rent.* (Article 3)

Translation:

**GT** : **itu** hampir tidak cukup uang untuk membayar sewa.

**BT** : **itu** hampir tidak cukup uang untuk membayar sewa.

#### 2. *That* as a Post-modifier

The translation similarity between these two machines can be seen in several sentences containing the determiner as follows:

*"You have taken **that** grief and turned it into a wonderful opportunity to try and help people who have suffered as you have suffered," George Brandis said.* (Article 2)

Translation:

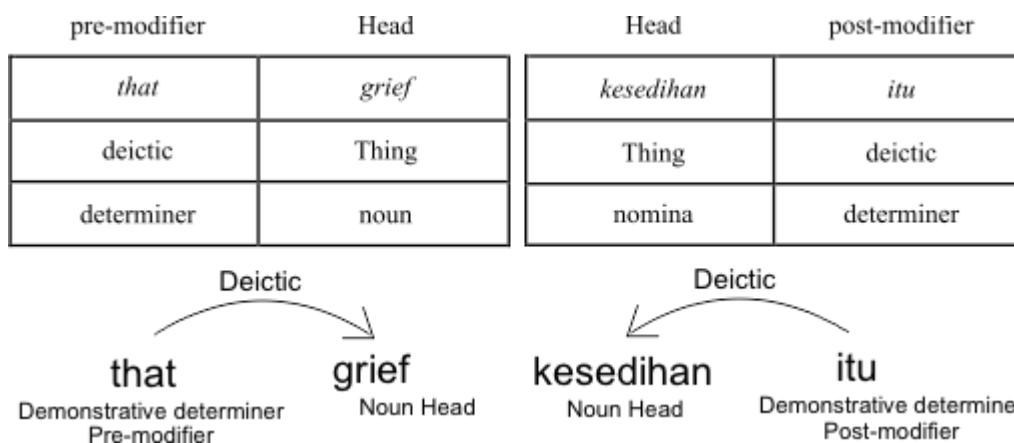
**GT** : "Anda telah menerima kesedihan **itu** dan mengubahnya menjadi

kesempatan yang luar biasa untuk mencoba dan membantu orang-orang yang telah menderita seperti yang Anda derita," kata George Brandis.

**BT** : "Anda telah mengambil kesedihan **itu** dan mengubahnya menjadi kesempatan yang indah untuk mencoba dan membantu orang yang telah menderita seperti yang Anda telah menderita," kata George Brandis.

From the translation above, it can be recognized that the structure of noun phrase *that grief* did not undergo such categorical shift at all. Nevertheless, due to the distinct syntactical construction between the English language and the Indonesian language, the logical structure of pre-modifier was transformed into post-modifier.<sup>2</sup> This such categorical shift—in Vinay and Darbelnet's term "servitude or obligatory transposition" (Munday, 2016, p. 93; Vinay & Darbelnet, 1995, pp. 27–30)—inevitably occurs in two languages with a different syntactical construction.

Table 8. Experiential - logical structures (English - Indonesian language)



### 3. *That* as a Post-modifier and a Conjunction

In this section, it is noteworthy to bear in mind that despite embodying three different lexemes *that* in one complex sentence, both machines were able to identify their distinct functions—two lexemes functioned as post-modifier in the form of relative pronoun *yang* (that), and the rest lexeme functioned as the conjunction in the form of the Indonesian particle *bahwa* (that) followed by the object complement clause.

*“This gives the first demonstration that in the wild there is a correlation between populations that get disease and populations that remain disease-free, and the mix of bacteria on the skin,” said Dr Lewis Campbell from the University of Exeter. (Article 1)*

Translation:

GT : “Ini memberikan demonstrasi pertama **bahwa** di alam liar ada korelasi antara populasi **yang** mendapatkan penyakit dan populasi **yang** tetap bebas penyakit, dan campuran bakteri pada kulit,” kata Dr Lewis Campbell dari University of Exeter.

BT : “Ini memberikan demonstrasi pertama **bahwa** di alam liar ada korelasi antara populasi **yang** mendapatkan penyakit dan populasi **yang** tetap bebas penyakit, dan campuran bakteri pada kulit,” kata Dr Lewis Campbell dari University of Exeter.

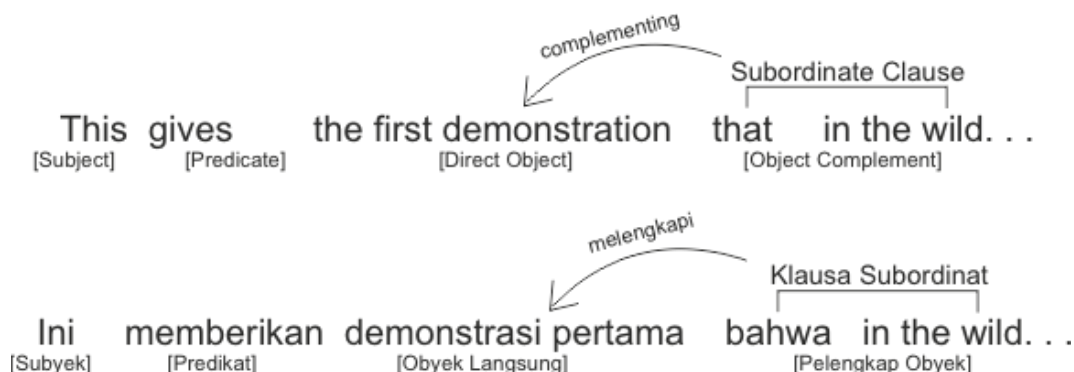


Illustration 1. The conjunction function in English and Indonesian language

As for the experiential and logical structures of the lexeme *that* as a post-modifier, it can be seen in the following Table 9 and 10.

<b>population</b>	<i>that</i>	<i>get</i>	<i>disease</i>
Thing	qualifier		
noun	relative pronoun	verb	noun

Table 9. Experiential - logical structures of the lexeme *that* as a post-modifier (English)

<b>Head</b>	post-modifier
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Table 10. Experiential - logical structures of the lexeme *that* as a post-modifier (Indonesian language)



<b>Head</b>	<b>post-modifier</b>		
<i>populas</i> <i>i</i>	<i>yang</i>	<i>mendapatka</i> <i>n</i>	<i>penyaki</i> <i>t</i>
Thing	qualifier		
noun	relative pronou n	verb	noun

### Differences of the Two Machine Translation Systems

Albeit the translation of these two machines was mostly equal in term of sentence construction, there were still differences emerging between *Google* and *Bing Translator*. The following section will elaborate such differences.

#### 1. Elliptical Variation of the Relative Pronoun *That*

*It's not the first time that militias and libertarians in the state have made headlines.* (Article 4)

Translation:

**GT** : Ini bukan pertama kalinya **Ø** (**bahwa**) milisi dan libertarian di negara bagian ini menjadi berita utama.

**BT** : Ini bukan pertama kalinya **bahwa** milisi dan libertarian di negara telah membuat berita utama.

Based on the translation above, it can be identified that in the first machine, the lexeme *that* was omitted whereas in the second one was translated into the Indonesian particle *bahwa*. The subordinate function, which to some degree refers to the relative pronoun *that*, was basically optional and thus could either be presented or omitted (Thomas, 1993). Due to its optionality, the translation of the first machine can be considered acceptable semantically and syntactically. In fact, based on the similarity of other findings acquired, it can be proven that the first machine, *Google Translate*, was indeed more creative and

could generate more variants in translating the relative pronoun *that* as a conjunction than the second one, *Bing Translator*. There was none of the translation generated by *Bing Translator* pertaining to the omission of the relative pronoun. It affirmed several studies (Achmad, 2016; Almahasees, 2018) pointing out that *Google Translate* is more creative and readable than *Bing Translator*.

#### 2. Translation Errors

It was found that there were translation errors in the second machine, *Bing Translator*, while translating the lexeme *that* as a subordinator of the following subordinate clause. The following examples illustrate how such errors occurred in the translation.

*It's part of a bigger project that Ashee hopes will eventually incorporate a medical centre and additional housing.* (Article 3)

Translation:

**GT** : Itu bagian dari proyek yang lebih besar **yang** diharapkan Ashee pada akhirnya akan menggabungkan pusat medis dan perumahan tambahan.

**BT** : Ini adalah bagian dari proyek yang lebih besar **bahwa** Ashee berharap pada akhirnya akan menggabungkan pusat medis dan perumahan tambahan.

The second machine translated the subordinator *that* into the Indonesian particle *bahwa* instead of the relative pronoun *yang*. Such translation cannot be considered acceptable due to the distinct function of *yang* (relative pronoun) and *bahwa* (particle) in the Indonesian language system. Specifically, there is only one single

acceptable translation to translate the lexeme *that* as a relative pronoun in a subordinate clause, that is the pronoun *yang*. Besides, in terms of the sentence structure, the translation of the second machine seems unnatural and highly literal compared to one of the first machine—Google Translate could even transform the diathesis of the relative clause structure from the active construction in the ST into the passive construction in the TT.

### 3. Translation Variation of *That* as a Post-modifier

Apart from its ability of generating the elliptical variation of the relative pronoun *that*, Google Translate could also achieve the variant equivalence of the lexeme *that* as a post-modifier through the use of adverbs (temporal adverbial). This differed from the translation of the second machine, *Bing Translator*, that seemingly tended to translate every constituent literally by word-for-word.

*Before that he used the name Saima, and wore women's clothes, but had to give up his third-gender identity to gain his family's acceptance.*

(Artikel 3)

Translation:

**GT** : **Sebelumnya** dia menggunakan nama Saima, dan mengenakan pakaian wanita, tetapi harus melepaskan identitas gender ketiga untuk mendapatkan penerimaan keluarganya.

**BT** : Sebelum **itu** ia menggunakan nama Saima, dan mengenakan pakaian wanita, tetapi harus menyerah identitas gender ketiga untuk mendapatkan penerimaan keluarganya.

Although these two translations, *sebelumnya* and *sebelum itu*, are acceptable semantically and syntactically in the Indonesian language, the use of translation variant in the first machine gives added values for *Google Translate* over *Bing Translator*. Besides, by using the adverb *sebelumnya*, the translation generated by *Google Translate* seems more contextual and natural than one of *Bing Translator*, which tended to be formal. Through its ability of translating the phrase *before that* into the single adverb *sebelumnya*, it can be justified that the algorithm used by *Google Translate* does not focus solely on word-for-word equivalence, but also on its pragmatic use.

### CONCLUSION AND RECOMMENDATION

Translating the lexeme *that* becomes one of many challenging issues for machine translation since it possesses various distinct functions and categories. Based on the findings acquired, it can be said that the two machine translation systems, *Google Translate* and *Bing Translator*, could translate the lexeme *that* very well—regardless several translation irregularities in the second machine. Furthermore, both machines could properly identify the three functions of the lexeme *that*, i.e., as a Head, as a post-modifier, and as a conjunction. The function of post-modifier was the most frequently occurring function by 19 times (47.5%), followed by the function of conjunction by 17 times (42.5%) in the first machine and by 18 times (45%) in the second one. The function of Head ranked third with the occurrence frequency of four times (10%) in the first machine and of three times (7.5%) in the second one. To sum up, due to a number of considerations, such as the elliptical variation of the relative pronoun *that* and the translation variants of the lexeme *that* as a post-modifier, the translation outputs of *Google Translate* were considered more

accurate, semantically acceptable, creative, and contextual than those of *Bing Translator*.

#### ENDNOTE

1. The ideational structure, in this study, is derived from the systemic functional linguistics by Halliday (2014) used to identify a phrase construction in a clause.
2. Despite the transformation of the logical structure of pre-modifier into post-modifier as the result of adapting the Indonesian syntactical system, the experiential function of its constituents, however, remained the same.

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