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## Literary machine translation

### The case of Danish cultural references

#### *Abstract*

This study examines how Google Translate, a neural machine translation system, handles cultural references when translating excerpts from a Danish novel into Spanish and English. Using a qualitative analytical framework combining cultural classification categories with translation structure categories and cultural reference equivalence, we analysed 24 segments across five categories: physical/material objects, gestures/habits, social roles/personalities, social organisations/businesses, and religious/social customs. Our findings reveal that Google Translate produces predominantly literal translations in both language pairs, but linguistic proximity significantly affects outcomes. Google translations into English achieved considerably more cultural reference *preservation* compared to Spanish, while Spanish translations showed higher rates of *cancellation* and *foreignising*. These results highlight persistent challenges when culturally embedded references are machine translated, particularly when cultural meaning is conveyed implicitly. The study has implications for translator training and the Danish publishing industry, and underscores the need for reader reception research in literary machine translation.

## 1 Introduction

Toral and Way (2018: 264) explain that literary texts are considered “the greatest challenge for machine translation”. This challenge becomes particularly apparent in the translation of cultural references (Besaciar/Schwartz 2015; Moorkens et al. 2018; Tezcan/Daems/Macken 2019). Currently, in a Danish context, publishing houses are investigating ways to make more literary texts available to a Danish audience (translating foreign-language texts into Danish) and for Danish literature to be made available to a non-Danish audience (most often translated into English) (Nielsen 2024). Using neural machine translation (NMT) and, more recently, also large language models (LLMs) (that power generative AI systems such as ChatGPT) paves the way for publishing translations of works that might not otherwise have been translated, given the high costs of working with Danish, a language with comparatively few human translators, and the limited number of Danish speakers worldwide. Some parts of the publishing industry seem to view the use of automated tools for translating literature as a way of making

material more accessible to a wider audience while still running a viable and profitable business. A common technology-assisted translation process in the publishing industry includes machine translating the text, which is then post-edited by a human translator and proofread by a native speaker of the target language (Tascha Lynggaard, metadata specialist at the publishers WeDoBooks, personal communication, 7 November 2024). Alternatively, the process includes machine translating the source text (ST), followed by post-editing, and then (perhaps) there are first and second readers in the workflow, a process that exemplifies what Koponen et al. (2020: 3) describe as the blurring of “traditional boundaries between the functions of translators, revisers and post-editors.” This blurring of translation workflow roles in Denmark is further investigated by Jansen (forthc.).

Early explorations, such as the 2019 workshop on *The qualities of Literary Machine Translation* at the 17th Machine Translation Summit in Dublin, asked the fundamental question whether literature is really “off-limits to technology” (Hadley et al. 2019, preface), and, in 2020, Slessor argued that NMT translation tools were not appropriate for translating literary texts due to their unique and non-repetitive nature (Slessor 2020: 239). This was also the foundation of some later studies investigating how Google Translate (GT) handles specific literary challenges, such as metaphorical language (Zajdel 2022) and culturally embedded features (Schjoldager et al. 2023). In a 2025 comparative study evaluating GT and LLMs on culture-specific items (CSIs) in literary texts, Budimir (2025) reports that culturally bound material remains a persistent challenge and that GT shows clear limitations in handling such items. At the same time, the landscape of AI translation functionalities has evolved significantly, and literary MT is now a rapidly growing research area, with technological advancements occurring at an unprecedented pace. Toral and Way (2018: 265) argue that NMT has now reached a level where it can support human literary translators in their endeavours to not only transfer the meaning, but “also preserve the reading experience of the original text.” Clearly, the continuous development of NMT technology necessitates ongoing testing rather than drawing permanent conclusions about its capabilities.

When it comes to translators’ actual use of NMT for literary translation, a practice appears to be evolving alongside the technology itself. Several reports indicate a growing number of literary translators who post-edit machine output rather than translate from scratch (Nielsen 2024; Klemin 2024; Mikkelsen/Conradsen/Mortensen 2024; Hanne Jansen, Associate Professor and literary translator, personal communication, 25 January 2025). This workflow change seems to be especially challenging when translators encounter cultural references, as these require both linguistic and cultural knowledge that NMT systems do not possess. The increasing integration of NMT into literary translation processes therefore raises questions about how translators maintain translation quality while navigating the challenges of literary texts, particularly in connection with cultural references. In fact, with a translation industry in which automation is taking over more and more tasks from the human translator, one invariably speculates if

translation automation will also be capable of delivering human-quality translations in all contexts (Christensen et al. 2022: 1–2; Schjoldager et al. 2023).

Investigating the case of literary translation, which must pay attention to both the surface story as well as to the underlying story told “between the lines” (Klitgård 2008: 249–250), this article builds upon Kenny and Winter’s (2024) framework of literary MT research and previous studies of the translation of literary texts (Matusov 2019; Tezcan/Daems/Macken 2019; Webster et al. 2020; Fonteyne/Tezcan/Macken 2020; Omar/Gomaa 2020; Yulianto/Supriatnaningsih 2021; Zajdel 2022; Kuzman/Vintar/Arčan 2019). Specifically, we examine how a generic NMT system – GT – handles cultural references in the translation of a literary text from Danish to Spanish and English. The translation of cultural references from Danish into each of these two languages has, to our knowledge, not previously been investigated and compared, and thereby we hope to contribute knowledge of affordances and restrictions of NMT for translating cultural references in literary texts. For the purposes of this article, cultural references are understood as meanings generated by social phenomena relating to one or more cultures, building on previous studies (Matusov 2019; Tezcan/Daems/Macken 2019; Webster et al. 2020; Fonteyne/Tezcan/Macken 2020; Omar/Gomaa 2020; Yulianto/Supriatnaningsih 2021; Zajdel 2022; Kuzman/Vintar/Arčan 2019). Within our analysis of cultural references, our human evaluation examines two dimensions: form – how the linguistic structure of cultural references has been rendered in the target texts (TT); and meaning – whether the same cultural meaning has been transferred from the ST to the TT. Thus, our investigation addresses the following two research questions (RQ):

RQ1: How do the Spanish and English translations differ in their structural treatment of cultural references (TSCs)?

RQ2: To what extent do the Spanish and English machine translations of cultural references differ in their communication of cultural meaning (CREs)?

Although GT, a general-purpose commercial NMT system, is not specifically trained on literary texts and may not be the optimal choice for assisting in the translation of literary works, it has been chosen for the study because it is one of the most widely used NMT systems globally (Caswell 2022). GT is also a popular choice among Danish professional translators, placing third at 22 % behind DeepL (24 %) and eTranslation (24 %) in a recent survey (Christensen et al. 2024). Furthermore, it has been used as a test case in previous studies on literary MT mentioned above. Therefore, examining GT serves as a representative case study for understanding the current capabilities and limitations of using an off-the-shelf and mixed-domain NMT technology for literary translation tasks.

The study aims to put GT through its paces with two different language pairs. For Danish-English translations, there is an assumption that modern NMT systems should perform relatively well because the languages involved are closely related Germanic languages with similar grammatical structures (König/van der Auwera 2002). Conversely,

the linguistic distance between Spanish, a Romance, Latin-based language, and Danish might entail challenges that reveal some limitations of using a generic NMT system with language pairs that are not closely related. Examining and analysing GT's performance on Danish-to-English and Danish-to-Spanish literary translations will contribute to discussions of the use of such technologies in the translation profession, and this could help publishers, translators and researchers evaluate the trade-offs and challenges of incorporating NMT into literary translation workflows when using non-specialised systems.

The article is structured as follows: In section 2, we present a review of research on the use of MT, including GT, for literary texts, before presenting our methodology, including our understanding of cultural references, in section 3. In section 4, our data analysis is presented and explained. Findings are discussed in section 5, and conclusions and future avenues of research are proposed in section 6.

## **2 Machine translation of literary texts**

Right from the outset of MT, it has been assumed that this technology is unsuitable for literary translation (Mounin 1963/1976; Austermühl 2001; Hutchins 2010 in Slessor 2020: 240–241). According to Constantine (2019: 473), literary translators found that the complex and nuanced nature of literature makes NMT ill-suited for the translation of literary texts. In the same vein, Slessor (2020: 239) pointed out that “there is a general assumption that literary translation is a unique and non-repetitive practice and that digital tools designed largely to improve the productivity of non-literary translators have few applications in the literary domain.” Toral and Way (2018: 264) explained that statistical MT (SMT) was historically more suitable for texts that could accept more literal translations, such as technical documentation, where the primary goal is to transfer meaning. They pointed out that literary translation requires more than just preserving meaning; it must provide readers with an equivalent reading experience to that of the original text, something SMT systems certainly struggled to achieve. However, the advent of NMT has renewed optimism among system developers and MT researchers regarding the capabilities of the technology when applied to literary translation.

Besacier and Schwartz (2015) studied phrase-based SMT (PBSMT) for English-to-French literary translation. Their findings on cultural references remain relevant despite the shift from PBSMT to NMT. While a reader panel found post-edited translations acceptable, the author's professional translator identified significant weaknesses, including the MT system's failure to handle cultural references correctly. The researchers concluded that MT with post-editing could make otherwise untranslated works accessible, though with compromised literary quality.

In contrast, Toral and Way (2018) evaluated NMT against a PBSMT system for English-to-Catalan literary translation using 12 novels. Their findings showed that NMT

significantly outperformed PBSMT across all novels, with performance affected by sentence length but not lexical richness. Their human evaluation revealed that between 17–34 % of NMT translations were judged equivalent to professional human translations, compared to only 8–20 % for PBSMT. The study found that NMT produced more fluent and culturally appropriate translations, with better handling of ambiguity and context. Toral and Way (2018) also found that while NMT generally produces better literary translations than previous systems, its advantage begins to fade with longer sentences.

Moorkens et al. (2018) investigated six professional translators' perceptions of post-editing machine translation of literary texts, comparing the usefulness of SMT and NMT in the translation process of the American novel *Warbreaker* (by Brandon Sanderson) from English into Catalan. Their study showed that all translators preferred translating from scratch, as the MT systems seemed to hinder their creativity, promote direct translation and create mistranslations. In terms of system performance, output from the NMT system was more fluent and generated more adequate results, yet both systems had problems with ambiguity and delivered mistranslations.

In their study of NMT for English-to-Slovene literary texts, Kuzman, Vintar and Arčan (2019) found that GT outperformed specialised literary NMT models but still struggled with contextual elements. Their error analysis revealed that all systems had difficulty with translating proper nouns as well as idioms. GT typically left unknown terms in their original form, while custom models sometimes invented non-existent words in Slovene. When attempting to make cultural adaptations, the systems occasionally made sensible changes (e. g., converting emergency numbers from 911 to 112), but there were also problematic changes, such as substituting metric units for imperial ones without converting the values. Despite these translation issues, their findings showed that post-editing NMT output of literary texts was measurably faster than translating from scratch, suggesting potential productivity benefits even for culturally rich texts like novels.

In another study, Constantine (2019) explored what the development of NMT means for the translation of literature. To this end, he translated different fragments of texts by Voltaire that exhibited potential problems for GT. While the translation of some of the examples reached an acceptable standard, GT struggled with features such as style, ambiguity and archaic language. However, demonstrating GT's ability to continuously learn and improve, the author found that translations of the same text fragments had improved within weeks of writing the article.

Slessor (2020) set out to explore Canadian literary translators' practices with technological tools and these translators' potential need for training. Not surprisingly, the study found that the vast majority of respondents use online dictionaries and internet-based language resources, while only a minor part of them used specialised technologies, such as CAT or MT. Specifically, Slessor (2020: 246) found that 70 % of respondents never used MT for translating literary works; 20 % used it rarely, 10 % used it occasionally, and no respondents reported frequent use. Those who did use MT often

employed it in unexpected ways. They did not use MT to produce translations directly, but rather as a research tool for identifying synonyms or verifying the spelling of proper nouns. Many non-users cited poor quality output as their primary reason for avoiding MT. Slessor (2020: 249) rightly pointed out that the fact that some translators use specialised technologies shows that these technologies offer some potential for specific types of literary translation tasks.

A growing area of research on machine-translated literary texts is creativity. Guerberof-Arenas and Toral (2022) compared three translation modalities of a science-fiction short story from English into Dutch and Catalan: NMT, post-editing, and human translation. Their results showed that human translations display higher creativity than machine-generated versions, which tend to rely more heavily on direct transfer and often fail to recreate creative effects. Zajdel (2022) examined whether GT could effectively convey metaphorical language in Oscar Wilde's *The Picture of Dorian Gray* translated from English into Spanish. The study showed that word-for-word translation may work for some simple metaphors but failed for idioms and expressions requiring cultural knowledge, and that GT often lacked the contextual awareness needed to generate culturally appropriate alternatives. Similarly, Schjoldager et al. (2023) compared a professional human translation into English of a Danish-language autobiography (Larsen 2004) with a GT translation. Although many segments were similar (62 %), the analysis showed that GT generally failed to translate culturally embedded features successfully.

Questions therefore remain regarding how NMT handles cultural references between languages of shared and different linguistic origins, and this is what our study seeks to address.

### 3 Methodology

This section outlines our methodological approach, beginning with the rationale for our selection of the ST, followed by our data selection criteria and analytical framework.

While we are aware of various translation evaluation quality metrics, including both automatic (for example the overview provided in Lee et al. 2023) and a mix of automatic and human evaluation methods (for example, Guerberof/Toral 2022), this small-scale study focuses solely on human evaluation of cultural references. All coding events described below were first coded and then evaluated by a second evaluator for both language pairs. An English native speaker was involved in the first round of coding for GT-EN translations and native speakers of Spanish were involved in the second round of coding for GT-ES translations.<sup>1</sup>

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<sup>1</sup> We would like to thank native speaker colleagues from Aarhus University, Denmark, and Universidad Pablo de Olavide, Spain, for discussing the translation from Danish into Spanish with us.

### 3.1 Methodological framework: Cultural references

Our understanding of cultural references draws on Kramsch's (1998/2000: 13) definition of culture as a shared way of thinking. This understanding acknowledges that different cultures may categorise and linguistically encode experiences differently. This is comparable to Nord's (1997/2001: 34) definition of cultural features (sometimes called *culturemes*), which are social phenomena that are specific to one culture in contrast to others. As an example, the first communion is celebrated in Spain, while this is not (usually) the case in Denmark.

In the context of translation, to analyse cultural elements systematically, we employed a cultural classification framework inspired by Nida (1975) and Newmark (1988: 103). We employed the following framework as our point of departure for pinpointing cultural references in the ST (Table 1):

1. Physical, material objects
2. Gestures and habits
3. Social roles and personalities
4. Social organisations and businesses
5. Religious and social customs

Table 1: Cultural classification framework

*Physical, material objects* pose challenges of direct untranslatability, since they often lack equivalent terms in other cultures. This may require the translator to negotiate between foreignisation, adaptation or loss of cultural specificity. *Gestures and habits* operate at the level of embodied cultural practice, requiring understanding of social norms and behavioural conventions that may not be explicitly stated in the text. *Social roles and personalities* reflect culturally-specific social hierarchies and identity categories, while *social organisations and businesses* encode institutional and political systems particular to cultures. Last, *religious and social customs* represent the deepest level of cultural meaning-making, embedding values and beliefs that require contextual and interpretive understanding to convey adequately.

As Newmark (1988: 95) observes, “many cultural customs are described in ordinary language, where literal translation would distort the meaning and a translation may include an appropriate descriptive-functional equivalent.” This challenge is particularly relevant for evaluating MT systems. While NMT systems may successfully identify cultural references through their surface linguistic markers, the critical question is whether they can render these references appropriately beyond literal translation, particularly when the references appear embedded in everyday language without explicit cultural marking. In literary texts, such references often serve narrative and aesthetic functions that rely on contextual and interpretive understanding rather than overt cultural signalling. Employing these five cultural categories rather than treating cultural

references as undifferentiated, we can examine whether performance patterns in the output of GT differ systematically across these distinct types of cultural encoding.

Using an inductive, bottom-up approach, our analysis examines how GT handles cultural references in translations from Danish into Spanish and English, identifying patterns in the data that allow for broad generalisations. This methodological approach aligns with recent work in culturally aware machine translation, where Yao et al. (2024) and Budimir (2025) draw on Newmark’s (1988) cultural classification framework to systematically identify and categorise CSIs for MT evaluation.

We began by identifying, describing and classifying cultural references from selected segments of the Danish novel (see Section 3.2), using our cultural classification framework above. We then compared the ST segments with their corresponding translations in both target languages to identify how these references were rendered in terms of 1. form and 2. meaning.

For form, we focused on structural features, meaning how TT segments were formally constructed and organised in relation to the ST segments. This analysis identified eight types of relations, termed *Translation Structure Category* (TSC), described and exemplified in Table 2 below. The examples in Table 2 were selected for illustrative purposes and are not included in our data set. All examples in Danish and Spanish are provided with a gloss in English throughout the article.

	Translation Structure Category (TSC)	Description
TSC1	Sameness of linguistic items	The segment is translated word-for-word.
example	ST: De holdt fast i traditionen med at <b>danse om juletræet</b> . [They held on to the tradition <b>of dancing around the Christmas tree</b> .] GT-EN: They held on to the tradition of <b>dancing around the Christmas tree</b> .	
TSC2	Sameness of linguistic items with direct transfer	The segment is translated word-for-word, with parts being transferred directly from the ST to the TT
example	De spiste altid and <b>Mortensaften</b> .* (*the evening before Saint Martin’s Day) [They always ate duck on <b>Morten’s Eve</b> .] GT-EN: They always ate duck on <b>Mortensaften</b> .	
TSC3	Sameness of linguistic items with deletion	The segment is translated word-for-word, with parts omitted
example	De bestilte en <b>kagekone</b> * til fødselsdagen. (*a “girl-shaped” cake often ordered for a girl’s birthday) [They ordered a <b>cake woman</b> for the birthday.] GT-EN: They ordered a <b>cake</b> for the birthday.	

	Translation Structure Category (TSC)	Description
TSC4	Sameness of linguistic items with a different grammatical structure	The segment is translated word-for-word, but using a different grammatical structure
example	Hun ønskede sig en <b>Betty Spaghetti-dukke</b> . [She wanted a <b>Betty Spaghetti doll</b> .] GT-ES: Quería una <b>muñeca de Betty Spaghetti</b> . [She wanted a <b>doll of Betty Spaghetti</b> .]	
TSC5	Sameness of linguistic items with lexical substitution	The segment is translated word-for-word, but a cultural term is substituted with a similar equivalent.
example	Mine børn kan godt lide at spise <b>risalamande</b> .* (*A Danish dessert eaten at Christmas time that has the consistency of rice pudding with added whipped cream, chopped almonds and vanilla.) [My children like eating <b>rice with almonds</b> .] GT-EN: My children like to eat <b>rice pudding</b> .	
TSC6	Mix-up of composite parts	Parts of the ST segments have been combined differently in the TT
example	Man havde iværksat en stor <b>bilen-ud-af-byen-kampagne</b> . [They had organised a big <b>car-out-of-the-city-campaign</b> .] GT-ES: Se había lanzado una gran <b>campaña para salir de la ciudad en coche</b> . [They had organised a big <b>campaign to get out of town in a car</b> .]	
TSC7	Direct transfer	The ST segment is transferred directly to the TT
example	<b>Jyllandsringen</b> er et motorsportsanlæg, der ligger i Jylland. [ <b>Jyllandsringen</b> is a motor-sports facility, which is located in Jutland.] GT-EN: <b>Jyllandsringen</b> is a motor-sports facility located in Jutland.	
TSC8	Translation into a third language	The ST segment is translated into a third language.
example	Hun abonnerede på <b>Bo Bedre</b> * (*A Danish lifestyle magazine) [She subscribed to <b>Bo Bedre</b> .] GT-ES: Ella se suscribió a <b>Stay Better</b> [She subscribed to a <b>Stay Better</b> .]	

Table 2: Translation Structure Category (TSC) with examples generated by GT

	Cultural reference equivalence <sup>2</sup>	Description
1	Preservation	The translation preserves the linguistic (denotative) meaning of the cultural reference in the ST (example 2 (GT-EN) below)
2	Neutralisation	The reference is generalised or neutralised (for instance, example 1 below)
3	Change of reference	The reference is made to something different from that of the ST segment (for instance, example 2 (GT-ES) below)
4	Cancellation	The reference is omitted entirely (for instance, example 6 below)
5	Foreignising	The translation preserves the original cultural reference, but background knowledge is required on the part of the reader in order to establish the correct cultural reference (Venuti 1995). (for instance, example 7 below)

Table 3: Cultural Reference Equivalence (CRE)

For meaning, we analysed how cultural references are rendered within each of the TSCs, focusing on the degree to which the cultural content is preserved or modified. For instance, we grouped all instances of the TSC “Sameness of linguistic items” and examined whether or not the cultural reference from the ST segment is preserved in the TT segment. Through this analysis, we identified five distinct patterns for how cultural references are rendered in the TT segments. We collectively defined these patterns as *Cultural Reference Equivalence (CRE)*, described and exemplified in Table 3 above.

### 3.2 Text selection

The ST comprises segments chosen from the Danish novel *Meter i Sekundet* (2020) by the Danish author Stine Pilgaard. It has been translated into English<sup>3</sup> by Hunter Simpson (*The land of Short Sentences*, Pilgaard 2022), but it has not yet been translated into Spanish. *Meter i Sekundet* is a witty novel about a young woman in her early 30s, who moves from Copenhagen to a small village in Western Jutland (a rural region of Denmark, characterised by its distance from major urban centres and its more traditional way of life), with her husband and their baby. Her husband has just started a new position as a teacher at a Danish folk high school (*højskole*), a distinctive type of residential adult

<sup>2</sup> ‘Equivalence’ should be understood as ‘functional equivalence’, meaning that the ST and TT are compared regarding the way the meaning of the TT relates to the meaning of the ST.

<sup>3</sup> Given that the focus of the current study is on comparing GT-EN and GT-ES translations of cultural references, we did not include the published English translation as a systematic point of comparison. However, in a small number of cases, the published English translation is referred to illustratively to clarify interpretive or reader-oriented implications of specific translation choices. A more systematic comparison between GT-EN output and the published English translation would be an interesting next step to investigate.

education institution founded on Grundtvig's educational philosophy from 19<sup>th</sup>-century Denmark. These schools offer academic, creative and practical classes to everybody outside the formalised school system. The novel humorously portrays the main character's struggle to adapt to village life and the rural mentality, where verbal communication is sparse and much content is left unsaid. This creates several comical situations, when the taciturn nature of the locals and the talkative nature of the newcomer clash.

The novel is full of both very short and very long sentences. Direct speech is never indicated by quotation marks, no chapter numbers or headings are provided, and each chapter presents a new idea or situation in which the main character finds herself in. Furthermore, the novel's accessible, everyday language is heavily interwoven with cultural references. These references test areas where NMT has shown improvement, particularly in handling ambiguity and intrasentential context, while exposing its limitations in accessing the "broader knowledge required to create an equivalent reading experience" (Moorkens et al. 2018: 16).

Working first independently and then as a group, we systematically identified cultural references that were expected to present particular challenges for GT. These were found in the first page of the novel (without page number) and in pages 11–14, 18–19, 197, 203, and 225–226. To avoid any potential copyright infringement from entering large portions of the novel into GT, we only input selected segments with sufficient surrounding context to ensure a fair assessment of the system's capabilities (Carré et al. 2022: 193). This contextualisation entailed including the preceding and following sentences of the segment being analysed and removing appositions or interchanging pronouns with noun phrases to disambiguate the cultural reference. In some cases, we also anonymised the examples by slightly changing the wording where it was clearly recognisable from the novel, i. e. deleting characteristic expressions, replacing words with synonyms, and paraphrasing. In total, we identified 24 segments in the ST containing cultural references (see Appendix for the complete dataset). In the analysis that follows, we examine 18 representative examples selected to cover all five groupings in the cultural classification framework. Both Spanish and English translations were generated using GT on 30 October 2024.

## 4 Analysis

This section presents our analysis of how GT handles cultural references when translating a literary text from Danish to Spanish and English. Applying the methodological framework outlined above to selected examples from our dataset, our analysis is organised around the five categories in the cultural classification framework (Table 1 above). Then, within each of these categories, we first analyse the examples using the TSC to assess how the cultural references are rendered structurally in each of the two languages (RQ1). Next, we examine each example using our five CRE categories to

evaluate how cultural meaning is conveyed (RQ2). This combined analysis allows us to understand not only how GT structurally handles these references, but also what cultural meaning is preserved (*preservation*) or modified, and to what degree (*neutralised, cancelled, changed, foreignised*).

#### 4.1 Physical, material objects

This category constitutes the largest in our data with 11 cultural references. These references include food items (*kajkager, onsdagssnegle*), transportation (*blå busser*), accommodation (*sommerhus, embedsboliger*), retail concepts (*gårdbutik, bland selv-slikket*) and branded products (*Pickwick, Medova, Emmaljunja, Kinderoverraskelse*). The following analysis examines GT translation patterns by grouping examples according to the TSCs identified in the data (namely TSC1, TSC3, TSC4, TSC5 & TSC6) and we discuss and compare the resulting CREs for both GT-ES and GT-EN.

##### 4.1.1 TSC1 Sameness of linguistic items

GT produced literal, word-for-word translations for seven ST segments. However, the outcomes differed between language pairs: five of the GT-ES translations maintained the same linguistic items, while all seven GT-EN translations maintained the same linguistic items. This means that two of the GT-ES translations diverged from this pattern and are categorised under different TSCs. The following table shows the resulting cultural equivalence for each segment, illustrating how literal translations can still produce different CRE outcomes depending on the target language. Each Danish expression is shown with a gloss translation into English, the resulting GT-ES and GT-EN translation, as well as the type of CRE achieved (*preservation, foreignising, neutralisation, change or cancellation*). In the next paragraphs, we explore some of these examples further.

###### *Example 1: CRE neutralisation (both GT-ES, GT-EN)*

The following example illustrates TSC1 translations that result in CRE neutralisation in both language pairs.

ST	Inden længe kommer eleverne kørende i <b>blå busser</b> fra hele landet. [Before long the pupils arrive driving in <b>blue buses</b> from all over the country.]
GT-ES	En breve llegarán estudiantes de todo el país en <b>autobuses azules</b> . [Before long the students arrive from all over the country in <b>blue buses</b> .]
GT-EN	Before long, the students arrive driving in <b>blue buses</b> from all over the country.

Danish readers would recognise that *blå busser* are coaches that go further afield, unlike city busses, which tend not to be blue. Both the GT-ES and GT-EN translations render *blå busser* as generic buses, resulting in *neutralisation*.

*Example 2: CRE change of reference (GT-ES), preservation (GT-EN)*

Identical translation structures do not guarantee identical cultural outcomes. Unlike the example above, the following example results in *change of reference*. This occurs when the TT segment refers to something fundamentally different from the ST. Notably, this occurs only in GT-ES, while GT-EN maintains the original reference (*preservation*).

ST	Alle de ansatte på skolen bor med deres familier i <b>embedsboliger</b> . [All employees at the school live with their families in <b>houses of residence</b> .]
GT-ES	Todos los empleados de la escuela viven con sus familias en <b>residencias oficiales</b> . [All employees of the school live with their families in <b>official residences</b> .]
GT-EN	All the employees at the school live with their families in <b>official quarters</b> .

The Danish term *embedsboliger* refers to accommodation that comes with certain job positions. The GT-ES translation is grammatically correct but semantically misleading. *Residencias oficiales* establishes a reference to prestigious government residences, such as the Prime Minister’s residence or the royal residence, rather than ordinary job-related housing. This creates an entirely different cultural reference. While the GT-EN translation *official quarters* preserves the denotative meaning of employment-related housing, the term typically evokes military or high-level governmental contexts in English. It is worth noting that the term *residences* was used in the published English translation (Pilgaard 2022), likely to avoid these institutional connotations.

#### 4.1.2 TSC3 Sameness of linguistic items with deletion

Our dataset contains two examples of word-for-word translations where parts of the ST were deleted: one in GT-ES resulting in CRE *neutralisation*, and one in GT-EN resulting in CRE *cancellation*.

*Example 3: CRE neutralisation*

The GT-ES translation of *kajkager* results in *neutralisation*.

ST	Ægteparret er gået ud ad døren med fire <b>kajkager</b> fra glasmontren. [The couple went out the door with four <b>kaj cakes</b> from the glass cabinet.]
GT-ES	El matrimonio ha salido con cuatro <b>pasteles</b> de la vitrina. [The couple left with four <b>cakes</b> from the cabinet]

In the Danish segment, *kajkager* refers to cakes shaped like a frog and named after a puppet, Kaj, from a Danish children’s programme from the 1970s. In the GT-ES translation, the cultural reference has been neutralised since *kaj* is deleted, while *kager* has been translated literally, and the translation itself is grammatically and semantically correct.

*Example 4: CRE cancellation*

The GT-EN translation of *bland selv-slikket* resulted in a morphologically distorted construction.

ST	I supermarkedet bliver jeg overvældet af muligheder foran <b>bland selv-slikket</b> . [“At the supermarket, I am overwhelmed by the possibilities at <b>the pick-and-mix-sweets</b> .]
GT-EN	In the supermarket, I am overwhelmed by the possibilities in front of <b>the self-licks</b> .

The expression *bland-selv-slik* refers to the practice in shops where customers select sweets and mix them in a bag themselves before weighing the bag and printing the price label. The word *slik* in Danish means sweets or confectionary. Here, the noun phrase has been rendered as *the self-licks*, which appears to be a direct, word-for-word translation of *selv* (self) and *slik* (lick). The translation omits the Danish word *bland* entirely. The critical error lies in the treatment of *slikket*. GT seems to have parsed it as a verb form (*slik* + infinitive marker, meaning *to lick*) or as a definite form of *lick* rather than recognising it as a definite form of *slik*. The literal compositional transfer, combined with the deletion of *bland* and the semantic misidentification of *slikket*, results in *CRE cancellation*, since the target reader has no access to the intended meaning of a common Danish retail practice and tradition of taking children to buy pick and mix sweets on Fridays or Saturdays.

**4.1.3 TSC4 Sameness of linguistic items with a different grammatical structure**

There is one case in our data of this TSC identified in the GT-ES translation of *Kinder-overraskelse*, resulting in *CRE cancellation*.

*Example 5: CRE cancellation*

ST	Jeg hader <b>Kinderoverraskelser</b> . [I hate <b>Kinder surprises</b> .]
GT-ES	Odio las <b>sorpresas de Kinder</b> . [I hate the <b>Kinder's surprises</b> .]

The Danish composite noun *Kinderoverraskelse* is the Danish brand name for Kinder Surprise, a milk chocolate egg with a toy inside developed by the Italian company Ferrero for children, a play on the German word for children. It has been translated into a noun phrase consisting of the head *sorpresas* and a modifier headed by the brand name *Kinder*. The translation is grammatically correct, but semantically incorrect due to the word in German. The inclusion of *Kinder* is only correct if used in the brand name, which, in Spanish, has the same grammatical structure as in Danish: *Kinder Sorpresa*.

#### 4.1.4 TSC6 Mix-up of composite parts

There is one example of this category from the GT-ES data. The example below describes the translation of *bland selv-slikket*, which was also problematic for the GT-EN translation, as described above. Both GT translations resulted in the same CRE *cancellation*, but appeared in different TSCs.

##### *Example 6: CRE cancellation*

One GT-ES translation in this category rearranged the composite parts of the ST segment *bland selv-slikket*.

ST	I supermarkedet bliver jeg overvældet af muligheder foran <b>bland selv-slikket</b> . [At the supermarket, I am overwhelmed by the possibilities at <b>the pick-and-mix-sweets</b> .]
GT-ES	En el supermercado me abruma las posibilidades que ofrece <b>el autolamidor</b> . [In the supermarket, I'm overwhelmed by the possibilities offered by <b>the self-lick</b> .]

The bolded TT element is a composition of a translation of *selv* (*self*) and *slikket* (*the sweets*). The Danish word *slikket* could also mean the act of licking, which is probably the explanation for the non-existent Spanish word *lamidor* in the TT element, which is morphologically related to the root *lam* (lick). This makes the meaning of the translation nonsensical and results in CRE *cancellation*.

#### 4.1.5 TSC7 Direct transfer

Two ST segments were directly transferred to the TT segments for both GT-ES and GT-EN. The resulting CRE categories were also identical in both language pairs.

##### *Example 7: CRE foreignising*

In both languages, the translations of *Pickwick & Medova*, which are well-known and popular low-budget tea brands sold in Denmark, resulted in CRE *foreignising*. This means that for the reader to establish a reference in either Spanish or English, contextual knowledge is needed. However, in this specific case, if readers are not familiar with the connotations of the tea brands that the author wishes to convey, these can also be inferred from the linguistic context, as shown below:

ST	<b>Pickwick</b> er kaffedrikkernes te. Det er skridtet før <b>Medova</b> . [ <b>Pickwick</b> is the coffee drinkers' tea. It is the step before <b>Medova</b> .]
GT-ES	<b>Pickwick</b> es el té de los bebedores de café. Es el paso previo a <b>Medova</b> . [ <b>Pickwick</b> is the coffee drinkers' tea. It is the step before <b>Medova</b> ]
GT-EN	<b>Pickwick</b> is the coffee drinkers' tea. It is the step before <b>Medova</b> .

In both translations, the context shows that the *Pickwick* brand is positioned as an intermediate choice before progressing to *Medova*, suggesting a quality hierarchy.

Readers unfamiliar with these brands can still understand the intended progression from the GT translations.

#### *Example 8: CRE neutralisation*

In the following example, we cannot presuppose that readers possess relevant background knowledge or that they can understand what is meant from the context.

ST	Vores barnevogn er en <b>Emmaljunga</b> . Den er så nem at klappe sammen. [Our pram is an <b>Emmaljunga</b> . It is so easy to fold.]
GT-ES	Nuestro cochecito es un <b>Emmaljunga</b> . Es muy fácil de plegar. [Our pram is an <b>Emmaljunga</b> . It is very easy to fold.]
GT-EN	Our pram is an <b>Emmaljunga</b> . It is so easy to fold.

For both target languages, the brand name has been directly transferred from Danish. As *Emmaljunga* is not a well-known brand in either Spanish or English-speaking countries, it does not evoke the same connotations as in Denmark, where many know it as a very large and practical pram brand of high quality. The cultural significance of this brand, usually associated with the Danish preference for large prams that allow babies to sleep comfortably during the day (often outside), is lost in translation. While readers can identify that *Emmaljunga* is a pram brand, the specific cultural associations shared among Danes are not transferred, resulting in CRE *neutralisation*.

## **4.2 Gestures and habits**

This category comprises culturally-specific patterns of behaviour and embodied practices, meaning everyday movements, gestures and habitual actions through which cultures express meaning. Gestures and habits require the translator to recognise that the same physical action may carry entirely different cultural meanings or may not exist as a recognised practice in the target culture. We only identified two ST examples within this cultural category.

### **4.2.1 TSC1 Sameness of linguistic items**

Our data contains two ST examples that both fall under TSC1. Notably, while both examples maintained the same linguistic items in the TT, the CRE categories differed across languages. Both GT-ES translations resulted in CRE *foreignising*, while the GT-EN translations resulted in CRE *preservation*. Below, we analyse one of the two examples.

*Example 9: CRE foreignising (GT-ES), CRE preservation (GT-EN)*

ST	<b>Med en finger mod kasketten</b> hilser landmændene. [ <b>With a finger towards the cap</b> greet the farmers.]
GT-ES	<b>Con un dedo en la gorra</b> , los agricultores saludan. [ <b>With a finger at the cap</b> , the farmers salute.]
GT-EN	<b>With a finger to the cap</b> , the farmers salute.

The GT-ES translation does not allow a reference to be established per se (*foreignising*). The sentence in Danish refers to the gesture (typical of rural Denmark) of greeting passers-by, by raising a hand to the cap or the side of the head. This is not a custom in Spain and it is therefore not clear what it means without the appropriate background knowledge. Conversely, the GT-EN translation allows a reference to be established (*preservation*), since this action is customary in many English-speaking countries, predominantly in rural areas (e. g. Ireland, Britain, the US). Nevertheless, the current phrasing is unidiomatic.

### 4.3 Social roles and personalities

This cultural category contains one cultural reference in our data. The reference involves a well-known Danish public figure whose cultural significance is tied to his professional role and public persona within Danish society.

#### 4.3.1 TSC7 Direct transfer

Within this category, we identified one example of TSC7 in our data, namely a well-known journalist and documentarist in Denmark, Anders Agger. He is particularly known and liked for his down-to-earth documentary portraits of different marginalised communities in Danish society. In the ST context, the narrator reflects on Anders Agger's empathetic approach to storytelling when considering how to understand different people.

*Example 10: CRE cancellation (both GT-ES, GT-EN)*

The text was handled identically for both languages. This direct transfer resulted in CRE *cancellation*.

ST	Jeg tænker på <b>Anders Agger</b> . [I think of <b>Anders Agger</b> .]
GT-ES	Estoy pensando en <b>Anders Agger</b> . [I am thinking of <b>Anders Agger</b> .]
GT-EN	I think of <b>Anders Agger</b> .

For reference, the official English translation also transfers the name directly with no additional context. This suggests that direct transfer of proper names may be a deliberate translation strategy for maintaining narrative flow in this context, even at the expense of cancelling the cultural reference.

#### 4.4 Social organisations and businesses

This category comprises institutional and locally organised structures specific to Danish society. Our data contain four cultural references: three denote Danish educational or care institutions (*friskole*, *højskole* and *dagpleje*) without direct equivalents in Spanish- and English-speaking contexts. The fourth example is a local proper name (a tailor's shop in the village where the novel is set), which functions as a place-based reference. The three institutional concepts present particular challenges for GT because they demand both linguistic and cultural-institutional knowledge to determine appropriate functional equivalents. The following analysis examines GT's handling of two references: one within TSC1 and one within TSC5.

##### 4.4.1 TSC1 Sameness of linguistic items

Similar to results in 4.2, the TSC in this example is the same for both languages, but the resulting CREs differ.

*Example 11: CRE change of reference (GT-ES), preservation (GT-EN)*

ST	Deres børn går på Velling <b>friskole</b> .
GT-ES	Sus hijos van a <b>la escuela independiente</b> Velling. [Their children go to the <b>independent school</b> Velling.]
GT-EN	Their children go to Velling <b>independent school</b> .

The GT-EN translation is both grammatically and semantically correct, and the cultural equivalence is preserved. However, this result is context-dependent. In isolation, GT translates *friskole* as *free school* (at the time of translating, October 2024), demonstrating how surrounding text can improve translation quality.

##### 4.4.2 TSC5 Sameness of linguistic items with lexical substitution

Again, the TSCs for this example are the same for both languages, but the resulting CREs differ.

*Example 12: CRE cancellation (GT-ES), neutralisation (GT-EN)*

ST	Ude foran min søns <b>dagpleje</b> prøver jeg at få barnevognen ind i bilen. [Outside my son's <b>childminder's house</b> I try to get the pram into the car.]
GT-ES	Afuera, frente a <b>la guardería</b> de mi hijo, intento meter el cochecito en el auto. [Outside, in my son's <b>nursery</b> , I try to get the pram into the car.]
GT-EN	Outside in front of my son's <b>day care</b> , I try to get the pram into the car.

Looking at the GT-EN translation, while *day care* is not incorrect, it represents the most generic term for childcare and neutralises important cultural specificity. The GT-ES translation, in turn, is not grammatically incorrect, but it changes the reference to nursery, which is a different type of childcare. In Danish, *dagpleje* refers specifically to home-

based childminding where one person cares for a small group of children (typically 3–5) in their own home. This can create a more intimate setting than institutional day care, with closer relationships between the childminder, the children and the parents or guardians. The small-group setting also means greater visibility for the child and their family, as daily interactions are direct and observable. In this scene, set in a small provincial town, the protagonist's struggle with the pram becomes more socially exposed and potentially embarrassing precisely because of the intimate scale and scrutiny inherent in *dagpleje*.

#### 4.5 Religious and social customs

This final category contains six ST segments from our data. These references include references to religious movements (*Indre Mission*), social traditions and celebrations (*konfirmationer*, *dåb*, *runde fødselsdage*), media features (*brevkasse*), and culturally-specific concepts related to child-rearing practices (*certificerede naturbørn*). These references present varied translation challenges. Some, like *certificerede naturbørn* and *Indre Mission*, are culture-specific phenomena without direct equivalents in the target cultures. Others, like *runde fødselsdage*, refer to practices that also exist in Spanish- and English-speaking cultures, but are linguistically encoded differently. This can create barriers for the TT readers to recognise the cultural equivalent. The following analysis examines seven examples of GT translation patterns grouped according to their structural category (here, TSC1, TSC2, TSC5, TSC6) and discusses the resulting CREs for GT-ES and GT-EN.

##### 4.5.1 TSC1 Sameness of linguistic items

Four of the ST segments in this cultural category were translated literally across the two target languages (*konfirmationer*, *dåb*, *runde fødselsdage* and *certificerede naturbørn*). For the first two – confirmations and baptism – the cultural references were preserved for both GT-ES and GT-EN. Below, we analyse one example of a literal translation that resulted in CRE *neutralisation* for both target languages, and one example of a GT-EN literal translation that resulted in CRE *cancellation*.

##### *Example 13: CRE neutralisation (both GT-ES, GT-EN)*

The literal translation of *runde fødselsdage* in both languages results in TT segments that retain the general reference to birthdays but fail to convey the Danish cultural practice.

ST	Navnet skal bruges i sange til konfirmationer og <b>runde fødselsdage</b> . [The name is used in songs for confirmations and <b>round birthdays</b> .]
GT-ES	El nombre debe usarse en canciones de confirmaciones y <b>cumpleaños redondos</b> . [The name must be used in songs for confirmations and <b>round birthdays</b> .]
GT-EN	The name must be used in songs for confirmations and <b>round birthdays</b> .

In Danish culture, *runde fødselsdage* refers to milestone birthdays that are multiples of ten. These are typically marked by large gatherings of family and friends from the age of 30 onwards. The term *rund*, or round, derives from the visual appearance of these numbers ending in zero.

Milestone birthdays are also celebrated in many English- and Spanish-speaking cultures, often with comparable social significance. The issue here is therefore not that the cultural practice itself is unfamiliar to target readers. Rather, the literal renderings *round birthdays* (GT-EN) and *cumpleaños redondos* (GT-ES) fail to activate the shared cultural understanding. The etymological motivation behind the Danish term *rund* is not transparent in either target language, and in Spanish *cumpleaños redondos* may even suggest a successful birthday celebration. This introduces a completely different meaning. As a result, without cultural context, target readers might struggle to make the connection to the familiar cultural practice. While readers understand that a birthday is being referenced, the specific cultural meaning is obscured and inferring the connection to numbers ending in zero requires considerable interpretive work. The GT translation thus neutralises the cultural reference.

*Example 14: CRE cancellation (GT-EN)*

Although translated word-for-word in GT-EN, *certificerede naturbørn* becomes *certified natural children*, a phrase that carries no recognisable cultural meaning in English, and arguably lacks a coherent meaning in English in this context.

ST	Jeg giver vores to <b>certificerede naturbørn</b> jakker på. [I put jackets on our two <b>certified nature children</b> .]
GT-EN	I give our two <b>certified natural children</b> jackets.

The expression *certificerede naturbørn* is creative and satirical drawing on two Danish cultural phenomena: first, the contemporary *naturbørn* (children of nature) movement in Danish pedagogy, which emphasises outdoor education and children's connection to nature; second, Danish society's emphasis on official certifications and quality labels (e. g. organic products, sustainable goods, etc.). The protagonist's ironic use of *certified* mocks the formalisation of what should be natural childhood behaviour, such as playing outdoors and connecting with nature. Structurally, GT employs a literal translation, rendering *naturbørn* as *natural children*. However, this literal approach results in CRE *cancellation*. This means that the TT reader has no access to the cultural specificity of the Danish nature pedagogy movement or to the satirical register of the expression. In an English-language context, *natural children* most readily suggests biological (as opposed to adopted) children, a meaning entirely unrelated to the cultural reference of the ST. The author uses this phrase to give the protagonist a satirical tone in the original, and this is completely absent in the TT. Furthermore, the literal translation introduces an additional semantic error: *giver (...) jakker på* (put jackets on) becomes *give (...) jackets*,

changing the action from the mother dressing the children to handing the children their jackets.

#### 4.5.2 TSC2 Sameness of linguistic items with direct transfer

This category includes one example: GT-ES translation of *Indre Mission*.

##### *Example 15: CRE cancellation (GT-ES)*

*Indre Mission* is the name of a Danish revivalist movement, which works to strengthen the Christian faith with a point of departure in the Bible as the word of God, personal faith, and a Christian everyday life (in English, sometimes referred to as the Home Mission).

ST	Byen er fyldt med iværksættere og idealister. Det er ikke bare minkfarme og <b>Indre Mission</b> . [The city is full with entrepreneurs and idealists. It isn't just mink farms and <b>Inner Mission</b> .]
GT-ES	La ciudad está llena de emprendedores e idealistas. No se trata sólo de las granjas de visones y de la <b>Misión Indre</b> . [The city is full with entrepreneurs and idealists. It isn't just mink farms and <b>Mission Inner</b> .]

The GT-ES translation of *Indre Mission* is rendered as *Misión Indre*, combining a literal translation (*Misión*) with a direct transfer of the position of the modifying adjective *Indre*. Following Spanish norms for adjective position, *Indre* has been post-posed. This creates a twofold problem: first, TT grammar (Spanish adjective post-positioning) is applied to ST lexical material (the adjective *Indre*, which remains untranslated), producing a phrase that is grammatically Spanish but semantically nonsensical (*la Misión Indre*); and second, the partial translation fails to achieve either the recognisability of full direct transfer or the clarity of complete literal translation. This results in CRE *cancellation*.

#### 4.5.3 TSC5 Sameness of linguistic items with lexical substitution

Sentences falling into this category are literal translations, apart from one element, where an important lexical substitution has been made in the TT. This results in a sentence that lacks coherence, making it difficult for the target reader to decipher the intended meaning. We discuss one ST example where both GT translations produce the same error.

*Example 16: CRE change of reference (both GT-ES, GT-EN)*

ST	Det var Dagbladet, der ringede, siger forstanderinden, og faktisk kunne de godt bruge en <b>brevkasse</b> . [It was the daily newspaper who rang, says the principal, and in fact they could use an <b>agony aunt</b> .]
GT-ES	Fue el periódico el que llamó, dice la directora, y de hecho les vendría bien un <b>buzón</b> . [It was the newspaper that called, says the head mistress, and they could actually use a <b>mailbox</b> .]
GT-EN	It was the newspaper that called, says the headmistress, and in fact they could use a <b>mailbox</b> .

In Danish, *brevkasse* carries two distinct meanings: the physical letter box/mailbox attached to an outside wall into which mail is delivered by a postal worker, or an agony aunt/advice columnist where readers submit problems to a newspaper for published responses. Here, it refers to the latter, and not the physical box. However, both GT-ES (*buzón*) and GT-EN (*mailbox*) select the physical object meaning, resulting in a CRE *change of reference*. This lexical substitution renders the sentence illogical: readers cannot understand why a newspaper would propose installing a physical mailbox, obscuring the intended meaning of the newspaper requiring someone to write an advice column.

**4.5.4 TSC6 Mix-up of composite parts**

As with the earlier TSC6 example of *bland selv-slikket* (Section 4.1.4), the GT-ES translation of *certificerede naturbørn* rearranges and combines the composite parts of the ST segment, creating a nonsensical TT output.

*Example 17: CRE Cancellation*

In this example, GT-ES produces a word-for-word translation but incorrectly merges elements from two separate ST noun phrases into a single TT construction. This structural mixing results in loss of translation equivalence, and the TT reader cannot infer the meaning from the surrounding text.

ST	Jeg giver vores to <b>certificerede naturbørn</b> jakker på. [I put jackets on our two <b>certified nature children</b> .]
GT-ES	Les regalo nuestras dos chaquetas <b>infantiles naturales certificadas</b> . [I give a way our two <b>natural certified children</b> jackets.]

The Danish sentence contains two noun phrases *certificerede naturbørn* (certified nature children) and *jakker* (jackets). In the GT-ES translation, however, these noun phrases have been combined into just one, headed by the noun *chaqueta* (jackets) and with *infantiles*, *naturales* and *certificadas* as modifiers. The resulting translation is semantically incoherent.

In the discussion that follows, we address our two research questions by analysing GT's structural treatment (TSCs) and communication of cultural references (CREs) in the translated segments, before examining the implications of these patterns for literary quality, reader experience, the Danish publishing industry and translator training.

## 5 Discussion

In this study, we set out to put the well-known and commonly-used NMT system, Google Translate, through its paces in the context of translating cultural references from Danish into Spanish and English. Our aim was to address two research questions:

RQ1: How do the Spanish and English translations differ in their structural treatment of cultural references (TSCs)?

RQ2: To what extent do the Spanish and English machine translations of cultural references differ in their communication of cultural meaning (CREs)?

Analysing the ST through the lens of the five cultural categories (see Table 5 below), we found the majority fall under physical, material objects, with 11 examples. This is followed by the category religious and social customs, which has six examples. The remaining three categories scored lower with four, two and one examples respectively.

Cultural classification	Source text
Physical, material objects	11
Gestures and habits	2
Social roles and personalities	1
Social organisations and businesses	4
Religious and social customs	6

Table 5: Distribution of cultural classification categories identified in our ST data

Categorising cultural references using this framework serves an important analytical purpose, allowing us to trace how cultural meaning is linguistically encoded and distributed throughout a text. The dominance of physical, material objects in our dataset points to a strong sense of place and cultural specificity, emphasising tangible aspects of daily life. This often reflects the author's intent to ground the narrative in local customs, traditions, or regional identity, which we have discussed above. From a translation perspective, such references pose challenges due to cultural untranslatability, as many objects lack direct equivalents in other languages, as was seen in our data. In the context of GT specifically, this matters significantly because NMT systems must navigate not just linguistic difference, but also the cultural untranslatability of seemingly straightforward elements that carry embedded local meaning. The framework thus allows us to systematically identify where GT is most likely to struggle, as physical objects frequently lack

direct equivalents across languages and require contextual or cultural adaptation that goes beyond lexical transfer. Importantly, the analysis also shows that GT's difficulties are not evenly distributed across cultural categories: references that rely on implicit, context-dependent cultural knowledge (rather than explicit cultural marking) pose greater challenges than those where cultural meaning is more transparent.

These initial findings are from the selected parts of the book, but analysing the book in its entirety would give greater insight into how common the various cultural categories appear in such a novel. It would be interesting to conduct a larger study to identify if such patterns exist within contemporary literature and the kinds of cultural items included in this genre or indeed across genres.

	<b>Translation Structure Category (TSC)</b>	<b>Spanish</b>	<b>English</b>	<b>Totals</b>
TSC1	Sameness of linguistic items	12	14	26
TSC2	Sameness of linguistic items with direct transfer	1	1	2
TSC3	Sameness of linguistic items with deletion	1	2	3
TSC4	Sameness of linguistic items with a different grammatical structure	1	0	1
TSC5	Sameness of linguistic items with lexical substitution	3	3	6
TSC6	Mix-up of composite parts	2	0	2
TSC7	Direct transfer	3	4	7
TSC8	Translation into a third language	1	0	1
	Totals	24	24	48

Table 6: Distribution of TSCs in the Google Translate output in Spanish and English

Addressing RQ1, it is unsurprising that the most dominant TSC in both language pairs (see Table 6) is TSC1 Sameness of linguistic items. Findings from several studies examining the translation of literary texts indicate how MT output tends to reflect the grammatical structure of the ST, producing literal, or word-for-word, translations for the TT (Webster et al. 2020; Schjoldager et al. 2023). This pattern appears marginally more pronounced in the GT-EN outputs (14 instances) compared to GT-ES (12 instances). This could potentially reflect the structural similarities between the two Germanic languages. However, direct, word-for-word approaches remain the default strategy for NMT systems regardless of the language family. This is even more so when NMT systems like GT are not specifically tuned for literary or cultural contexts. This literal approach represents a safe strategy to preserve denotative meaning, though it does not

always capture connotative or culturally embedded meanings. Notably, the GT-EN translations maintained literal renderings within a relatively narrow range of structural variation. While the GT-ES translations were also predominantly literal, they showed a slightly broader spread across different translation structure patterns (TSCs). This suggests that GT handled Danish-to-English translations more consistently, introducing fewer unconventional structures compared to Danish-to-Spanish translations, where the greater linguistic distance may have prompted more varied structural approaches when literal transfer proved problematic.

Worth noting for the remaining TSCs in both GT-ES and GT-EN is that when they deviate from literal, word-for-word translation, they predominantly remain within literal translation paradigms rather than producing fundamentally different ones. For example, TSC2, TSC3, TSC4 and TSC5 all represent variations of literal translation, including deletion, direct transfer, restructuring grammatical elements and lexical substitution. The one notable exception is TSC6 mix-up of composite parts, which appears twice in the GT-ES output. Unlike the other categories, TSC6 represents a processing error where GT incorrectly analyses Danish compound structures, resulting in the GT-ES output being semantically distorted. For instance, where the same Danish compound produced TSC3 (literal with deletion) for GT-EN, it produced TSC6 for GT-ES. This suggests that while both NMT engines default to literal strategies, GT-ES encounters greater difficulty parsing Danish morphological compounds.

<b>Cultural reference equivalence (CRE)</b>	<b>Spanish</b>	<b>English</b>	<b>Totals</b>
Preservation	2	10	12
Neutralisation	4	6	10
Change of reference	5	1	6
Cancellation	8	5	13
Foreignising	5	2	7
Totals	24	24	48

Table 7: Distribution between cultural reference equivalence (CRE)

Addressing RQ2, Table 7 shows the distribution of Cultural Reference Equivalence (CRE) categories across both target languages. Overall, *cancellation* is the most frequent outcome (13 instances), followed closely by *preservation* (12 instances) and *neutralisation* (10 instances), while *change of reference* (6 instances) and *foreignising* (7 instances) are the least frequent. However, examining each target language separately reveals markedly different patterns. For GT-ES translations, *cancellation* (8 instances) is the dominant outcome, followed by *foreignising* (5 instances) and *change of reference* (5 instances), while *preservation* occurs in only 2 instances (both religious ceremonies – baptism and confirmation). In contrast, GT-EN translations show *preservation* (10 instances) as the most frequent category, followed by *neutralisation* (6 instances) and *cancellation* (5 instances), with only 2 instances of *foreignising*.

The findings align with the initial assumption that GT performs better on closely related languages (Danish-English) than on more distant ones (Danish-Spanish), with the GT-EN translations preserving cultural references more frequently than the GT-ES translations. The structural and lexical similarities between Danish and English resulted in a higher number of CRE *preservation*. Conversely, the greater linguistic distance between Danish and Spanish introduced more CRE *change of reference*, *cancellation* and *foreignising* in conveying cultural meanings. However, there are also five examples of CRE *cancellation* in the GT-EN translations, which can undermine the translation's literary quality and impede the reader's grasp of cultural meanings. These instances suggest that the NMT system also struggled with context-dependent cultural references in the GT-EN translations, indicating a generalised limitation of NMT in handling culturally embedded language.

The way cultural references were handled – whether *preserved*, *changed*, *neutralised*, *foreignised* or *cancelled* – has clear implications for the literary quality of the translations and the reader's experience. The analysis revealed that GT-EN translations achieved more instances of reference *preservation* (keeping the original cultural reference intact), while GT-ES translations had more reference *foreignising* (leaving out the reference and counting on the reader's background knowledge to interpret it). GT-EN output often gave readers of the TT a closer approximation of the Danish setting, for example with translations such as 'independent school' (*friskole*), 'summer house' (*sommerhus*), and '... with a finger to the cap, the farmer salutes' (*Med en finger mod kasketten hilser landmændene*). Conversely, GT-ES output more frequently either allowed the reference to stand (often untranslated or literally translated) or *cancelled* it by substituting with a generic equivalent (e. g. translating *højskole* as 'universidad' – a term familiar to Spanish readers but not culturally equivalent).

When references are accurately transferred, the TT preserves the reading experience of the original text (Toral/Way 2018). For instance, the concept of a 'farm shop' (*gårdbutik*) in GT-EN maintains the rural Danish charm for the reader. Yet, this is possible because the same cultural concept exists in English-speaking regions and can therefore be translated word-for-word. In contrast, *neutralising* or *cancelling* a reference can simplify the reading of the TT but may flatten the cultural richness. Both GT-ES and GT-EN translations have a high rate of reference *cancellation*, meaning that a reception study of these texts might indicate that readers find the text more immediately understandable, yet potentially less distinctive or evocative of Danish culture. Crucially, when literal translations fail to convey the connotations of the ST element (as with the GT-EN example: *højskole* → *college*), the reading experience deviates from that of the original. The subtle loss of meaning noted in the *højskole* example – in which neither *universidad* nor *college* fully captures the ST concept – illustrates how cultural references can slip through the cracks of literal translation, leading to a less rich and even slightly misleading narrative experience for the TT reader. This resonates with process research showing that MT-mediated work can shift translators' attention toward evaluating MT

suggestions. In literary contexts, this can reduce engagement with the interpretive potential of the ST and become especially consequential when cultural meaning is carried implicitly (Kolb 2023).

The rapid emergence of LLMs opens new frontiers for literary translation, prompting comparisons with general-purpose NMT systems like GT (see also Budimir 2025). Although LLMs are not purpose-built for translation, recent comparative studies suggest they can produce translations of good quality, though they still differ in subtle ways from texts originally written by native speakers (Sizov et al. 2024). At the same time, large-scale evaluation indicates that published human literary translations are still preferred overall, and that results depend strongly on the evaluation method (Zhang/Zhao/Eger 2025). This dependence on evaluation methodology is particularly important when assessing performance on culturally embedded references. Unlike static NMT systems, LLMs operate through an interactive process in which users can provide contextual information and strategic instructions (Schjoldager et al. 2023: 259). While this interactivity does not in itself guarantee improved literary translation quality, it raises the possibility that such systems could complement tools like GT in literary contexts. For instance, a translator might guide an LLM to handle a cultural reference by providing background about the novel's setting, potentially receiving a translation that better preserves the original's intent or tone. Importantly, these possibilities remain hypothetical in the absence of systematic empirical testing. The current study's results, which highlight areas where GT fell short in cultural adaptation, point to specific ways that a chatbot could be explored to address these gaps. Building on this, further research investigating iterative processes using LLMs could shed light on the potential role of automated translations within the literary translation workflow, examining how LLMs shape translator decision-making when handling cultural references (Kolb 2023).

Our analysis of how GT renders cultural references impacts the Danish publishing industry, as they seek economically viable ways to translate works from low-resource languages like Danish while maintaining literary quality. The findings highlight the importance of quality assurance processes when post-editing MT output. For publishing workflows, this means quality assessment cannot rely on a single scheme such as Multidimensional Quality Metrics, but should combine careful human assessment with protocols tailored to literary aims (Zhang/Zhao/Eger 2025).

While we did not conduct reader reception studies akin to related studies with literary machine translation (Guerberof-Arenas/Toral 2020; Guerberof-Arenas/Moorkens 2023), our analysis of the output can be considered through the lens of Nord's functionalism in literary translation, with emphasis on the translation meeting the purpose and expectations of the target audience. We believe the GT translations showed both potential and shortcomings in achieving the desired effect. In many cases, a direct transfer in the GT translations did not fully achieve the cultural aims of the novel's excerpts. For example, the Danish brand of pram Emmaljunga (*neutralisation*) or the

Danish TV celebrity Anders Aggers (*cancellation*). The act of conveying the meaning of these cultural references was not met. The many instances of cultural reference *neutralisation* (e. g. *kajkager* with GT-ES ‘pasteles’ or *højskole* with GT-EN ‘college’) fulfilled the basic meaning but not the cultural purpose. The TT in such cases does not convey the same background knowledge or connotations as that of the source, thus losing or altering the reference’s function in evoking a specific concept in the reader’s mind.

Yet, when GT achieved CRE *preservation* or *foreignising* across both languages, it partially satisfied the cultural aims by evoking a roughly similar concept. The GT-EN translations, with several *preserved* references, arguably stayed closer to fulfilling the cultural purpose of the text for its target reader than the GT-ES translations did. These observations imply that raw MT output rarely meets the cultural aims fully.

From a translator training perspective, the presence of reference *cancellation* in both GT-ES and GT-EN translations highlights the need for translation students to develop the skills necessary to critically assess and refine machine-generated output. These instances suggest that even in the GT-EN translations, the NMT system struggled with context-dependent cultural references, indicating a broader limitation of NMT in handling culturally embedded language. Our results echo recent evaluations reporting limitations in GT’s handling of cultural references in literary texts (Budimir 2025). Kolb’s process research further suggests that working from MT output can change how translators approach a literary text, including how they read and interpret it, which is particularly relevant when cultural meaning is not explicit in the wording and must be inferred from context (Kolb 2023). Taken together, these findings provide a clear argument for the importance of introducing translation students to NMT and post-editing in the literary translation classroom, not as a shortcut to bypass human translation, but as a means of critically engaging with the strengths and limitations of these tools.

One final discussion point: while our targeted approach identified where GT succeeded and failed with cultural references, the study’s limited scope (one novel, one NMT system, one point in time) provides only a snapshot. Our findings align with Budimir (2025), who similarly found GT relies heavily on literal translation for Dutch-Serbian CSIs, suggesting GT systematically fails to adapt cultural references regardless of language pair. To explore this pattern further, testing additional language pairs could verify whether linguistic proximity influences the quality of automated cultural reference translation, as well as tracking improvements through GT updates and testing multiple NMT systems. For all these comparative approaches, reader reception studies would be necessary to address questions of readability and reading experience for target audiences.

## 6 Conclusion

This article investigated GT, a widely-used general-purpose NMT system, to assess its capabilities in the translation of cultural references from a Danish novel into Spanish and English. Our findings demonstrate that while NMT systems continue to advance in quality, they continue to struggle with translating culturally embedded references. In particular, they struggle when cultural meaning is conveyed implicitly rather than through explicit linguistic markers, which is a feature central to literary translation. The analysis reveals a clear performance difference between the chosen language pairs, confirming our assumption that linguistic proximity impacts automatic translation quality. Among translation educators, questions have been raised as to the implications of this development regarding translator training and the direction that training should take given this situation. Although NMT has shown promising performance on different text types, including technical documentation and other formulaic texts (Toral/Way 2018; Moorkens et al. 2018), results such as those from our own study show that there is still a need to focus on the teaching of translation of more creative texts.

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## Appendix: Cultural references

Physical, material objects	
<b>ST</b>	<b>Pickwick</b> er kaffedrikkernes te. Det er skridtet før <b>Medova</b> . (GLOSS: “Pickwick is coffee drinkers’ tea. It is the step before Medova.”) <b>Cultural reference:</b> Pickwick and Medova are regarded as inferior brands by “dedicated tea drinkers”.
<b>GT-ES</b>	<b>Pickwick</b> es el té de los bebedores de café. Es el paso previo a <b>Medova</b> .
<b>analysis</b>	<b>TSC7 Direct transfer:</b> The brand names have been directly transferred into Danish. If readers are not familiar with the connotations that the brands evoke with dedicated tea drinkers, they can be deduced from the context in which they appear.
<b>CRE</b>	Foreignizing
<b>GT-EN</b>	<b>Pickwick</b> is the coffee drinkers' tea. It is the step before <b>Medova</b> .
<b>analysis</b>	<b>TSC7 Direct transfer:</b> Similarly, direct transfer was applied to the English translation, and readers not familiar with these brands can deduce the meaning from the surrounding context.
<b>CRE</b>	Foreignizing
<b>ST</b>	Inden længe kommer eleverne kørende i <b>blå busser</b> fra hele landet (GLOSS: “Before long arrive the pupils driving in <b>blue buses</b> from all over the country.”) <b>Cultural reference:</b> <i>blue buses</i> in Danish refer to coaches that go further afield, unlike city buses.
<b>GT-ES</b>	En breve llegarán estudiantes de todo el país en <b>autobuses azules</b> .
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically and semantically correct, but readers need to have background knowledge in order to establish the cultural reference. Otherwise, reference is established to buses that are blue.
<b>CRE</b>	Neutralisation
<b>GT-EN</b>	Before long, the students arrive driving in blue buses from all over the country
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> This translation results in an English sentence that is grammatically but not semantically correct. Focusing on the blue buses, the literal translation does not provide any cultural context to the reader as to why these specific buses are mentioned.
<b>CRE</b>	Neutralisation

<b>ST</b>	Alle de ansatte på skolen bor med deres familier i <b>embedsboliger</b> . (GLOSS: “All the employees at the school live with their families in <b>employment houses</b> .”) <b>Cultural reference:</b> <i>embedsboliger</i> refers to accommodation that comes with certain job positions.
<b>GT-ES</b>	Todos los empleados de la escuela viven con sus familias en <b>residencias oficiales</b> .
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> the translation is grammatically correct, but semantically incorrect. <i>embeds-</i> can be translated a number of ways into Spanish. The translation into official establishes a reference to the Prime Minister’s residence or the royal residence. The translation, therefore, does not enable the reader to establish a cultural reference.
<b>CRE</b>	Change of reference
<b>GT-EN</b>	All the employees at the school live with their families in <b>official quarters</b> .
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically and semantically correct, with the term ‘quarters’ referring to housing or accommodation provided by an employer. However, culturally ‘official quarters’ is linked to military personnel and their families.
<b>CRE</b>	Preservation
<b>ST</b>	Min veninde havde købt sit <b>sommerhus</b> i landsbyen, en dag hun var ude at gå en tur. (GLOSS: “My friend had bought her <b>summer house</b> in the village, one day she was out walking.”) <b>Cultural reference:</b> <i>sommerhus</i> refers to a house, most often in the country, in many cases privately owned, for recreational use in holidays and days off work.
<b>GT-ES</b>	Mi amiga había comprado <b>su casa de verano</b> en el pueblo, un día salió a caminar.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically and semantically correct, but readers need to have background knowledge in order to establish the cultural reference. In Spain, many holiday homes are flats near the beach.
<b>CRE</b>	Foreignizing
<b>GT-EN</b>	My friend had bought her <b>summer house</b> in the village, one day she was out for a walk.

<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> There is a grammatical temporal mismatch with the verb and the action (simple past tense), but the translation of <i>sommerhus</i> is correct, since this is what the accommodation is referred to in English-speaking contexts. However, much of the implicit cultural information to Danish summer houses would need to be included in the text elsewhere.
<b>CRE</b>	Preservation
<b>ST</b>	Der findes en <b>gårdbutik</b> på vej mod København (GLOSS: “You can find a <b>farm shop</b> on the way towards Copenhagen.” <b>Cultural reference:</b> <i>gårdbutik</i> refers to a shop where a farm sells its own (locally grown) products
<b>GT-ES</b>	Hay una <b>tienda agrícola</b> de camino a Copenhague.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically and semantically correct. However, it does not convey the meaning of <i>gårdbutik</i> . Rather, it refers to a shop that sells products for agricultural use. The translation, therefore, does not enable the reader to establish a cultural reference.
<b>CRE</b>	Change of reference
<b>GT-EN</b>	There is a <b>farm shop</b> on the way to Copenhagen
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> This translation is both grammatically and semantically correct. The same concept also exists in English-speaking countries, enabling the reading to establish a cultural reference
<b>CRE</b>	Preservation
<b>ST</b>	I supermarkedet bliver jeg overvældet af muligheder foran <b>bland selv-slikket</b> . (GLOSS: “In the supermarket am I overwhelmed by possibilities in front of <b>blend-the-self-sweets</b> .”) <b>Cultural reference:</b> a selection of sweets from which customers can choose and mix themselves in a shop. It is customary in Denmark to go with your children on a Friday to buy pick and mix sweets.
<b>GT-ES</b>	En el supermercado me abruma las posibilidades que ofrece <b>el autolamidador</b> .
<b>analysis</b>	<b>TSC6 Mix-up of composite part:</b> The translation is a composition of a translation of <i>selv</i> ( <i>auto</i> ) and a word that does not exist ( <i>lamidor</i> ), but which is morphologically related to the root ( <i>lam</i> (lick)). The meaning of the translation is nonsense.
<b>CRE</b>	Cancellation
<b>GT-EN</b>	In the supermarket, I am overwhelmed by the possibilities in front of <b>the self-licks</b>

<b>analysis</b>	<b>TSC3 Sameness of linguistic items with deletion:</b> The translation has omitted the 'bland' from the Danish sentence ("blend"), and slikket has been incorrectly translated as perhaps a verb ("slik -> to lick") or a definite form of the noun "lick". The word slik can also mean 'sweets' in English, but Google Translate has not considered this translation based on the surrounding context. Like with Spanish, the meaning of the translation is nonsense.
<b>CRE</b>	Cancellation
<b>ST</b>	Ægteparret er gået ud ad døren med fire <b>kajkager</b> fra glasmontren. (GLOSS: "The married couple went out the door with four <b>kaj cakes</b> from the glass display case.") <b>Cultural reference:</b> <i>kajkage</i> refers to a cake shaped like a frog and named after a puppet from a Danish children's programme from the 1970s.
<b>GT-ES</b>	El matrimonio ha salido con cuatro <b>pasteles</b> de la vitrina.
<b>analysis</b>	<b>TSC3 Sameness of linguistic items with deletion:</b> <i>kaj</i> has been deleted, while <i>kager</i> has been literally translated. The translation is grammatically and semantically correct, but the cultural reference has been neutralised.
<b>CRE</b>	Neutralisation
<b>GT-EN</b>	The married couple have gone out the door with four <b>kayak cakes</b> from the glass case.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The entire sentence in Danish has been translated literally into English, resulting in a neutralised cultural reference, since 'kajkager' has been rendered as 'kayak cakes' which makes no sense in this context.
<b>CRE</b>	Neutralisation
<b>ST</b>	Jeg hader <b>Kinderoverraskelser</b> . (GLOSS: "I hate Kinder Surprises.") <b>Cultural reference:</b> <i>kinderoverraskelse</i> refers to a chocolate egg that contains a small toy.
<b>GT-ES</b>	Odio <b>las sorpresas de Kinder</b> .
<b>analysis</b>	<b>TSC4 Sameness of linguistic items with a different grammatical structure:</b> The Danish composite noun has been translated into a noun phrase consisting of the head <i>sorpresas</i> and a modifier headed by the German noun <i>kinder</i> . The translation is grammatically correct, but semantically incorrect due to the word in German. The inclusion of <i>Kinder</i> is only correct if used in the brand name, which, in Spanish, has the same grammatical structure as in Danish: <i>kinder sorpresa</i> .
<b>CRE</b>	Cancellation
<b>GT-EN</b>	I hate <b>Kinder surprises</b> .

<b>analysis</b>	<b>TSC2 Sameness of linguistic items with direct transfer:</b> The compound word ‘ <i>kinderoverraskelse</i> ’ has been split, with the brand name Kinder directly transferred in the English translation. But surprises has been translated as if it refers to the regular noun and not the company’s product, which is spelt with a capital ‘S’ in the English-speaking market. It is interesting that GT capitalised ‘Kinder’ to represent the company name, rather than simply directly transferring the word ‘kinder’ from the compound noun. Perhaps the cultural reference would be preserved even though the name of the company’s product has not been spelt correctly.
<b>CRE</b>	Preservation
<b>ST</b>	Vores barnevogn er en <b>Emmaljunga</b> . Den er så nem at klappe sammen. (GLOSS: “Our pram is a <b>Emmaljunga</b> . It is so easy to fold together”.) <b>Cultural reference:</b> Emmaljunga is a well-known pram brand name, which, in Denmark, is considered to be of a very good quality and large enough to let the baby sleep in it.
<b>GT-ES</b>	Nuestro cochecito es un <b>Emmaljunga</b> . Es muy fácil de plegar.
<b>analysis</b>	<b>TSC7 Direct transfer:</b> The brand name has been directly transferred into Danish. As Emmaljunga is not a well-known brand in Spain, it does not evoke the same connotations as in Denmark.
<b>CRE</b>	Foreignizing
<b>GT-EN</b>	Our pram is an <b>Emmaljunga</b> . It is so easy to fold.
<b>analysis</b>	<b>TSC7 Direct transfer:</b> The brand name has been directly transferred into Danish. As Emmaljunga is not a well-known brand in English-speaking countries, it does not evoke the same connotations as in Denmark.
<b>CRE</b>	Foreignizing
<b>ST</b>	Stellet på barnevognen låser, og min veninde siger, at den slags altså bare ikke sker med <b>en Odder</b> . (GLOSS: ” <b>Cultural reference:</b> <i>Odder</i> is a well-known pram brand name, which, in Denmark, is considered to be of a very good quality. It is, however, also the Danish noun for “otter”.
<b>GT-ES</b>	El armazón del cochecito se cierra con llave y mi amigo dice que este tipo de cosas no le suceden a <b>una nutria</b> .
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> the translation is grammatically correct, but semantically incorrect. <i>Odder</i> in Danish, is homonymous, one of its meanings being <i>otter</i> . This is the meaning that has been translated here. The translation, therefore, does not enable the reader to establish a cultural reference.
<b>CRE</b>	Cancellation

<b>GT-EN</b>	The frame of the pram locks, and my friend says that this sort of thing just doesn't happen with an Otter.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The word 'odder' in Danish means 'otter' in English. Therefore, the word has been directly translated into English, and given that the word is spelled with a capital letter in Danish, this has also been transferred to the English text. However, given that 'Odder' is a well-known Danish pram brand name, the term should have been transferred directly from the ST to the TT. Preserving the capital letter implies that this is a brand name in the TT, but translating the brand name from Danish to English incorrectly does not allow the reader of the TT to establish a cultural reference to the Danish brand.
<b>CRE</b>	Cancellation
<b>ST</b>	Jeg sidder i Sebastians <b>Christianiacykel</b> . (GLOSS: "I'm sitting in Sebastian's Christiania bike.") <b>Cultural reference:</b> <i>Christiania-cykel</i> refers to a cargo bike named after the free town Christiania in Copenhagen where it was designed at the beginning of the 1980s.
<b>GT-ES</b>	Estoy sentado en la <b>bicicleta de Christiania</b> de Sebastián.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically correct, but semantically incorrect. <i>Christiania-cykel</i> is not well-known in Spain and is apparently only sold online by its English name: <i>Christiania bike</i> . Therefore, <i>bicicleta de Christiania</i> merely refers to bikes from Christiania and not to the brand name. This results in a neutralised cultural reference.
<b>CRE</b>	Neutralisation
<b>GT-EN</b>	I'm sitting on Sebastian's <b>Christiania bike</b> .
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> This translation is both grammatically and semantically correct. It is a word-for-word translation, and the system has successfully broken up the composite word into two correct words in English 'Christiania' and 'bike'. The capital letter is directly transferred from the ST to the TT, and this transfer is appropriate in this context to indicate a name or brandname. While readers can identify that <i>Christiania bike</i> refers to a bike, the crucial specification that it is a cargo bike is absent from the TT, along with the associated Danish cultural practice of routinely transporting adults and children in such vehicles.
<b>CRE</b>	Neutralisation
<b>Gestures and habits</b>	

<b>ST</b>	Med en finger mod kasketten hilser landmændene. (GLOSS: “With a finger up to the cap, the farmers salute.”) <b>Cultural reference:</b> <i>hilse med en finger mod kasketten</i> refers to the gesture (typical of rural Denmark) of greeting passers-by, by raising the hand to the side of the head.
<b>GT-ES</b>	<b>Con un dedo en la gorra</b> , los agricultores saludan. (GLOSS: “With a finger at the cap, the farmers salute
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> the translation is grammatically correct, but semantically unclear. As the gesture is not universally known in Spain, it is unclear what it means.
<b>CRE</b>	Foreignizing
<b>GT-EN</b>	<b>With a finger to the cap</b> , the farmers salute.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> This is a grammatically and semantically correct translation, while a little awkwardly transferred to the target text.
<b>CRE</b>	Preservation
<b>ST</b>	Bilerne kører forbi udenfor, og købmanden <b>løfter sin hånd op mod tindingen</b> . (GLOSS: “The cars pass by outside, and the shop keeper <b>lifts his hand to his temple</b> .”) <b>Cultural reference:</b> <i>løfte en hånd op mod tindingen</i> refers to the gesture (typical of rural Denmark) of saluting passers-by, by raising the hand to the side of the head.
<b>GT-ES</b>	Los coches pasan fuera y el comerciante <b>levanta la mano hacia el templo</b> .
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically correct, but semantically unclear. As the gesture is not universally known in Spain, it is unclear what it means.
<b>CRE</b>	Foreignizing
<b>GT-EN</b>	The cars pass outside, and the merchant raises his hand to the temple.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The sentence is unidiomatic, but a reference could most likely be created due to the context and background knowledge of the reader (permission).
<b>CRE</b>	Preservation
<b>Social roles and personalities</b>	
<b>ST</b>	Jeg tænker på <b>Anders Agger</b> . (GLOSS: “I think of <b>Anders Agger</b> .”) <b>Cultural reference:</b> Anders Agger a well-known journalist and documentarist in Denmark, particularly known for his down-to-earth documentary portraits of different marginalised communities in Danish society.

<b>GT-ES</b>	Estoy pensando en <b>Anders Agger</b> . (GLOSS: “I am thinking of <b>Anders Agger</b> .”)
<b>analysis</b>	<b>TSC7 Direct transfer:</b> Anders Agger has been directly transferred into Spanish.
<b>CRE</b>	Cancellation
<b>GT-EN</b>	I think of <b>Anders Agger</b> .
<b>analysis</b>	<b>TSC7 Direct transfer:</b> Anders Agger has been directly transferred into English.
<b>CRE</b>	Cancellation
<b>Social organisations and businesses</b>	
<b>ST</b>	Forstanderinden har lige været ovre på <b>højskolen</b> for at stille blomster ind på elevernes værelser. (GLOSS: “The headmistress has just been to the <b>school</b> to put flowers in the students’ rooms.”) <b>Cultural reference:</b> <i>højskole</i> is an exam-free boarding school for adult education based on values of community, development and “school for life”.
<b>GT-ES</b>	La directora acaba de visitar <b>la universidad</b> para poner flores en las habitaciones de los estudiantes.
<b>analysis</b>	<b>TSC5 Sameness of linguistic items with lexical substitution:</b> the translation is grammatically correct, but semantically incorrect. <i>højskole</i> is translated with the Spanish word for university, which creates a different meaning. The cultural reference cannot be established.
<b>CRE</b>	Cancellation
<b>GT-EN</b>	The headmistress has just been over to the college to put flowers in the students’ rooms.
<b>analysis</b>	<b>TSC5 Sameness of linguistic items with lexical substitution:</b> the translation is grammatically correct, and perhaps semantically incorrect. <i>højskole</i> is translated with the English word ‘college’. This term can be used in several different instances of ‘education’ in the English-speaking world and can refer to a university, a sixth form college (upper secondary school), or another kind of learning environment. Therefore, a cultural reference could be established with background knowledge from the reader, but this puts too much responsibility onto the reader to understand the Danish concept.
<b>CRE</b>	Neutralisation
<b>ST</b>	Deres børn går på Velling <b>friskole</b> . (GLOSS: “Their children go to Velling <b>free school</b> .”) <b>Cultural reference:</b> <i>friskole</i> refers to a type of private school which can be established by a group of people (typically parents and teachers) who wish for a different set of values than those on which national schools are usually based.

<b>GT-ES</b>	Sus hijos van a <b>la escuela independiente</b> Velling. (GLOSS: “their children go to the <b>independent school</b> Velling.”)
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically correct, but semantically incorrect. Qualifying a school as being independent does not convey the meaning of <i>friskole</i> , which does not enable the reader to establish the cultural reference.
<b>CRE</b>	Change of reference
<b>GT-EN</b>	Their children go to Velling <b>independent school</b> .
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> This translation is both grammatically and semantically correct. Interestingly, if <i>friskole</i> is translated on its own, GT gives ‘free school’, but with the addition of some context, GT produces an adequate translation.
<b>CRE</b>	Preservation
<b>ST</b>	Ude foran min søns <b>dagpleje</b> prøver jeg at få barnevognen ind i bilen. (GLOSS: “Outside my son’s <b>daycare</b> try I to get the pram into the car.”) <b>Cultural reference:</b> <i>dagpleje</i> refers to a childcare scheme, where a child carer looks after a small group of toddlers in her own home.
<b>GT-ES</b>	Afuera, frente a <b>la guardería</b> de mi hijo, intento meter el cochecito en el auto. (GLOSS: “Outside, in my son’s <b>nursery</b> , I try to get the pram into the car.”)
<b>analysis</b>	<b>TSC5 Sameness of linguistic items with lexical substitution:</b> <i>dagpleje</i> is translated with the Spanish word for nursery and therefore creates a different meaning.
<b>CRE</b>	Cancellation
<b>GT-EN</b>	Outside in front of my son’s <b>day care</b> , I try to get the pram into the car.
<b>analysis</b>	<b>TSC5 Sameness of linguistic items with lexical substitution:</b> <i>dagpleje</i> is translated with the English word day care, when a more similar concept is ‘childminder’ (UK)/‘home daycare provider’ (US), and therefore the translation creates a different meaning.
<b>CRE</b>	Neutralisation
<b>ST</b>	Hvilken skrædder har du brugt, spørger kvinden, <b>Brud, Fest og Sy?</b> (GLOSS: “Which tailor did you use, asks the woman, <b>Bride, Party and Sewing?</b> ”) Cultural reference: <b>Brud, Fest og Sy</b> is the name of a tailor shop.
<b>GT-ES</b>	¿Qué sastre usaste, pregunta la mujer, <b>Bride, Party y Sew?</b>
<b>analysis</b>	<b>TSC8 Translation into a third language:</b> The shop name has been translated into English, apart from the conjunction, which has been transferred. This misleads Spanish readers into thinking the shop has an English name, thereby changing the cultural reference from Danish to international/anglophone.

<b>CRE</b>	Change of reference
<b>GT-EN</b>	Which tailor did you use, asks the woman, <b>Bride, Party and Sew?</b>
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation of the shop name is grammatically and semantically correct. One could argue that ‘sew’ would read better in the TT as ‘sewing’ as a service the shop offers.
<b>CRE</b>	Preservation
<b>Religious and social customs</b>	
<b>ST</b>	Navnet skal bruges i sange til <b>konfirmationer</b> og runde fødselsdage.
<b>GT-ES</b>	El nombre debe usarse en canciones de <b>confirmaciones</b> y cumpleaños redondos.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically and semantically correct.
<b>CRE</b>	Preservation
<b>GT-EN</b>	The name must be used in songs for <b>confirmations</b> and round birthdays.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is both grammatically and semantically correct.
<b>CRE</b>	Preservation
<b>ST</b>	Der er også mange, der blev viet i forbindelse med <b>en dåb</b> . (GLOSS: “There are also many who were consecrated in connection with <b>a baptism.</b> ”)
<b>GT-ES</b>	También hay muchos que se casan con motivo de <b>un bautismo</b> . (GLOSS: “Also, there are many who are consecrated on occasion of <b>a baptism.</b> ”)
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically and semantically correct.
<b>CRE</b>	Preservation
<b>GT-EN</b>	There are also many who were consecrated in connection with a baptism.
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The term ‘dåb’ has been translated directly to ‘baptism’ and all of the items have been kept in the same structure from the ST to the TT. The resulting TT is both grammatically and semantically correct.
<b>CRE</b>	Preservation
<b>ST</b>	Navnet skal bruges i sange til konfirmationer og <b>runde fødselsdage</b> . (GLOSS: “The name is used in songs for confirmations and <b>round birthdays.</b> ”) <b>Cultural reference:</b> <i>runde fødselsdag</i> refers to birthdays where the age ends in zero and which, traditionally, makes for a special celebration.

<b>GT-ES</b>	El nombre debe usarse en canciones de confirmaciones y <b>cumpleaños redondos</b> .
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation is grammatically correct, but semantically unclear. Although birthdays with ages that end in zero are celebrated as something special, they are not conceptualised as a distinct cultural practice.
<b>CRE</b>	Neutralisation
<b>GT-EN</b>	The name must be used in songs for confirmations and <b>round birthdays</b> .
<b>analysis</b>	<b>TSC1 Sameness of linguistic items:</b> The translation produces something that is not a concept in English. While someone might guess what a round birthday is from the '0' in the number, you cannot expect a reader to understand this reference.
<b>CRE</b>	Neutralisation
<b>ST</b>	Byen er fyldt med iværksættere og idealister. Det er ikke bare minkfarme og <b>Indre Mission</b> . (GLOSS: "The town is full of entrepreneurs and idealists. It's not just mink farms and <b>Inner Mission</b> ." <b>Cultural reference:</b> Indre Mission is the name of a Danish revivalist movement, which works to strengthen the Christian faith with a point of departure in the Bible as the word of God, personal faith, and a Christian everyday life.
<b>GT-ES</b>	La ciudad está llena de emprendedores e idealistas. No se trata sólo de las granjas de visones y de <b>la Misión Indre</b> . (GLOSS: " The city is full with entrepreneurs and idealists. It isn't just mink farms and Mission Inner.")
<b>analysis</b>	<b>TSC2 Sameness of linguistic items with direct transfer:</b> The translation is a mix between direct transfer ( <i>Indre</i> ), literal translation ( <i>Misión</i> ). Following Spanish norms for attributive adjective position, the adjective <i>Indre</i> has been postponed ( <i>Misión Indre</i> ).
<b>CRE</b>	Cancellation
<b>GT-EN</b>	The city is full of entrepreneurs and idealists. It's not just mink farms and <b>Indre Mission</b> .
<b>analysis</b>	<b>TSC7 Direct transfer:</b> The name of the religious organisation has been directly transferred into the English translation and not translated literally. The target reader would not understand the Danish reference, even given the surrounding context.
<b>CRE</b>	Cancellation

<b>ST</b>	Jeg giver vores to <b>certificerede naturbørn</b> jakker på. (GLOSS: “I put jackets on our two certified nature children.”) <b>Cultural reference:</b> <i>certificerede naturbørn</i> is not a conventionalized expression, but, in our interpretation, is a “creative take” on the many certification programmes that exist. <i>naturbørn</i> refers to children who feel at home in nature and know how to behave in nature. It could be argued to be a satirical coinage playing on Danish nature pedagogy movements and certification culture, in general.
<b>GT-ES</b>	Les regalo nuestras dos <b>chaquetas infantiles naturales certificadas</b> . (GLOSS: “I give away our two <b>natural certified children jackets</b> .”)
<b>analysis</b>	<b>TSC6 Mix-up of composite parts:</b> The translation uses a different grammatical structure, as <i>vores to certificerede naturbørn jakker</i> has been translated as one whole noun phrase, rather than two separate ones ( <i>vores to certificerede naturbørn</i> and <i>jakker</i> ). This makes the translation nonsensical.
<b>CRE</b>	Cancellation
<b>GT-EN</b>	I give our two <b>certified natural children jackets</b> .
<b>analysis</b>	<b>TSC3 Sameness of lexical items with deletion:</b> The translation is a word-for-word translation minus the translation of the final word ‘på’ which then further contributes to the nonsensical TT.
<b>CRE</b>	Cancellation
<b>ST</b>	Det var dagbladet, der ringede, siger forstanderinden, og faktisk kunne de godt bruge en <b>brevkasse</b> . (GLOSS: “It was ‘dagbladet’ who rang, says the head mistress, and actually could they really use an <b>agony aunt</b> ”.) <b>Cultural reference:</b> <i>brevkasse</i> refers to a section of a newspaper or magazine that receives questions from the readers on a specific topic. The agony aunt then answers these questions, and both questions and answers are published.
<b>GT-ES</b>	Fue el periódico el que llamó, dice la directora, y de hecho les vendría bien <b>un buzón</b> . (GLOSS: “It was the newspaper that called, says the head mistress, and they could actually use a mailbox.”)
<b>analysis</b>	<b>TSC5 Sameness of linguistic items with lexical substitution:</b> The translation is grammatically and semantically correct. However, <i>brevkasse</i> has been translated into its literal sense referring to a box where letters are posted.
<b>CRE</b>	Change of reference
<b>GT-EN</b>	It was the newspaper that called, says the headmistress, and in fact they could use a <b>mailbox</b> .

<b>analysis</b>	<b>TSC5 Sameness of linguistic items with lexical substitution:</b> The translation is grammatically and semantically correct. However, <i>brevkasse</i> has been translated into its literal sense referring to a box where letters are posted.
<b>CRE</b>	Change of reference

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