Writer-reader relationship in multilingual health information websites on HIV and TB diagnostic testing: features of non-translated and translated Catalan texts in comparison with non-translated and translated English and Spanish texts

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Natives and immigrants need cross-culturally adapted health information websites in each their own language. The reader's decision-making process is influenced by the writer's word choices. The author examines the characteristics of writer-reader relationship in the Catalan versions of multilingual health information websites on HIV and TB diagnostic testing. The study compares the non-translated Catalan texts to the English and Spanish non-translated texts, and the translated Catalan texts to their non-translated counterparts. A corpus of seventy-three multilingual health information websites underwent a mixed analysis implementing Clerehan et al.'s (2005) Evaluative Linguistic Framework, which is based on Systemic Functional Linguistics. There exist differences between the three non-translated sub-corpora. The Catalan non-translated sub-corpus expressed the most solidarity. The Spanish non-translated sub-corpus expressed a balance between solidarity and power. The English non-translated sub-corpus displayed the most power. Hedge words were the only writer-reader relationship marker with two statistically significant results: the English non-translated sub-corpus contained more than the Catalan non-translated sub-corpora, and the Catalan translated sub-corpus contained more than its non-translated counterpart. The latter difference indicates a lack of cross-cultural adaptation on the part of the translators. These results should serve researchers and professionals in public health and translation and language sciences for future studies and guidelines to improve multilingual health information text for diverse communities.

Keywords:*, Catalan, cross-cultural adaptation, health communication, translation, writer-reader relationship*

1 Introduction

Cross-cultural adaptation (or cultural adaptation) is defined as the redesign of the message so that the target audience of a different culture would respond in the desired manner. Guillemin (1995: 61, 63, respectively) describes cross-cultural adaptation as "comprising of translation in standard language plus adjustment of cultural words, idioms and context, possibly involving the complete transformation of some items in order to capture the same concept" and stresses that "the adaptation should keep equivalent the material issued from previous work and preserve all aspects of its validity." Culturally adapted multilingual health information websites are needed to convince the readers to follow the recommended measures to reduce the prevalence of the two deadliest pre-COVID-19-pandemic infectious diseases: HIV and tuberculosis (TB) (Taylor 2023).

Language needs have been overlooked in HIV/AIDS-related health communication (Batchelor et al. 2019). Health information websites that are not culturally adapted results in noncompliance with the call to action, which places the target communities at risk of higher

incidence of disease along with discrimination and its resulting economic impacts. These instances of health disparities (Garcimartín Cerezo et al. 2014) occur when certain groups are more negatively affected by a lack of access to culturally adapted health information about an infectious disease. The socioeconomic impacts of health disparities extend beyond these different language communities into their city, region, and country.

To achieve compliance among the readers across diverse language groups, the practice of cross-cultural adaptation is worthwhile for multilingual health information website translators. Translators may find that following cross-cultural adaptation guidelines (Guillemin 1995) is time-consuming. However, it is cost-effective and is the result of trials and development by sociologists, psychologists, and researchers specialized in methodology, along with health communication experts (Guillemin 1995). A big question remains: how can the quality of cross-cultural adaptation truly be checked? No standardized methods exist to assess this aspect of the quality of online health information.

Website quality instruments that evaluated multilingual health information websites for quality (e.g., HON[1]) failed to consider cross-cultural adaptation, linguistics, and translation (see, for example, Lawrentschuk et al. 2012; Wiriyakijja et al. 2016; Rew et al. 2018). To analyze cross-cultural adaptation of multilingual health information websites about HIV and TB testing, there is a need for research using a linguistic framework and methodology.

Among the linguistic aspects of cross-cultural adaptation is the tone of the text, or the writer's attitude towards the reader. Writer-reader relationship is analogous to a person's response to another's request, differing due to the vocal tone, and based on the responding person's cultural background, including the way language is used to transmit a message so that the reader will respond in the desired manner.

To the best of the author's knowledge, this is the first study that analyzes writer-reader relationship in multilingual health information websites on HIV and TB testing in English, Spanish, and Catalan. The objective of this study is to reveal any differences between English, Spanish, and Catalan in writer-reader relationship in multilingual HIV and TB testing health information websites as perceived by the target readers in multicultural communities. The research question is:

1. In health information websites on HIV and TB diagnostic testing in English, Spanish, and Catalan, are there variations regarding writer-reader relationship between:
    a. The non-translated texts in English, Spanish, and Catalan?
    b. The non-translated and translated texts in Catalan?
    c. What are the key cross-linguistic differences?

The next section presents the theoretical framework and the methodology. The results will then be presented and discussed with recommendations for future research. This paper concludes with the limitations and implications for health communicators, translators, along with researchers in linguistics and public health.

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[1] The Health on the Net (HON) Foundation is a World Health Organization-sponsored multilingual non-government organization, whose mission is to accredit human health websites employing the main principles of the "basic ethical standards in the presentation of information." The HON Code is one example of a self-regulatory initiative to promote high ethics and quality in health information websites (Risk & Dzenowagis 2001).

2 Materials and methods

This paper showcases a section of a larger study, in which a comparable corpus was built via Google searches[2] using the keywords "HIV," "tuberculosis," "diagnosis," and "test" in English, Spanish, and Catalan. The corpus consisted of 73 multilingual health information websites containing English, Spanish, and/or Catalan versions that contained a section on HIV or TB diagnostic testing. The qualifying websites were available to the public, provide information about HIV or TB diagnostic testing, and include at least two of the following languages: English, Spanish and Catalan. Table 1 shows the breakdown into languages, each of which had a non-translated (L1) and a translated (L2) sub-corpus.

Table 1: The six sub-corpora

Group	English L1	English L2	Spanish L1	Spanish L2	Catalan L1	Catalan L2
Number of websites	52	16	7	65	8	2
Total number of words	34,351	6,245	2,383	43,420	4,047	1,749
Average number of words per text	661	390	340	668	506	875

There are discrepancies between the sub-corpora, which was an anticipated and unavoidable issue that was addressed in the statistical analysis. The only translated sub-corpus that this paper focuses on is the Catalan. However, that the statistical analyses include all six sub-corpora must be considered.

Once the corpus was built, the writer-reader relationship was assessed. Finally, via statistical and discourse analysis, the similarities and differences between the languages and between the non-translated and translated texts within each language were ascertained.

The texts underwent a writer-reader relationship analysis using the Evaluative Linguistics Framework (ELF) (Clerehan et al. 2005). This instrument was based on the theoretical framework called Systemic Functional Linguistics (SFL) (Halliday & Matthiessen 2014). SFL states that the text and its immediately surrounding context of situation, which incorporates the three elements of *register*, interface with each other. The three elements of *register* that this research examines are: *field* (layman's vs specialized terminology), *tenor* (writer-reader relationship), and *mode* (websites as a form of planned written texts). Beyond the context of situation is the context of culture, which influences the way that the text is perceived by the reader.

Correlated to *tenor* is interpersonal (also known as interactional) metadiscourse, which "alert[s] readers to the author's perspective towards […] the readers themselves, thus contributing to a writer-reader relationship" (Hyland 1998: 443; Ho 2016). Interpersonal metadiscourse markers are devices for the writer to relate to the reader in the process of informing and persuading them. In health promotion campaigns, persuading the reader to comply cannot be accomplished simply by stating the contents. What truly matters is the way

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[2] The searches were performed using an anonymous browser with no cookies, a cleared history and cache, and with the location data blocked and GPS deactivated, a protocol also followed by Alioshkin Cheneguin et al. (2020).

the message is given. This is how interpersonal metadiscourse influences the tone of the way that the writer relates to the reader.

From the SFL viewpoint, two perceptions exist regarding the social indicators of *tenor*: *power* and *solidarity* (Martin 1998; Tebble 1999). *Power* on the discursal level involves negotiation (e.g., exchange and speech function) and appraisal (e.g., engagement, affect, judgment). On the lexicogrammatical level, they may include evaluative lexis, modal verbs, polarity words, and repetition. On the other hand, *solidarity* on the discoursal level reflects involvement (e.g., naming) and includes pertinent technical and slang terms. Through *solidarity*, the writer expresses the level of intimacy or formality with the reader. The writer must establish trust, show respect, and display empathy with the reader, and maintain all this throughout the text (Tebble 1999). A successful writer's advice and recommendations will be accepted and acted upon by the reader. Modals can also assist the writer's persuasion by expressing assurance or concession. By reassuring the reader, the writer promotes compliance. *Solidarity* and *power* are expressed through markers that include those of interpersonal metadiscourse.

Hyland & Jiang (2018) reviewed the use of metadiscourse markers – which include hedge words, relational and engagement markers, and person markers and self-mentions – in scientific discourse over the last fifty years. There was an overall "trend towards more reader guidance" and a "rhetorical shift in argumentation patterns in academic writing towards a greater awareness of readers" (Hyland & Jiang 2018: 28). This increment in the writer as an identity in the text and what writers anticipate in their readers may influence health professionals, whose work culture differs from the culture of the outside world.

This observation inspired the addition of Mishler's (1984) Voice of Medicine & Voice of Lifeworld – which personifies the subcultural aspects of writer-reader relationship in terms of their respective primary roles: the health expert writer and the lay reader. The writer is a health professional who speaks a specialized language with their colleagues. When communicating health information to the public, the writer is responsible for modifying their word choices, since the public speaks only the language of the lifeworld. To the best of this author's knowledge, this study is the first time that the Voice of Medicine & Voice of Lifeworld was applied within the context of SFL to aid in the assessment of the tone of the multilingual health information websites.

The ELF has been implemented and adapted by the developers and other researchers over the last fifteen years to analyze other forms of health communications, including patient information leaflets and informed consent documents (Clerehan & Buchbinder 2006; Hirsh et al. 2009; Sand et al. 2012; Petkovic et al. 2015; Clerehan et al. 2016; Morony et al. 2018; Cavalieri et al. 2019). This instrument is now being applied to a new type of register: multilingual health information websites.

For this new register, the ELF was adapted (ELF-W). Its questions to analyze writer-reader relationship incorporated markers to determine the writers' attitude through their use of language to engage, guide, and persuade the reader (Hyland & Jiang 2018). The ELF-W writer-reader relationship questions are as follows:

- Are the identity of the writer and the reader clear?
  - The identities were either explicit or - if the writer did not make any overt references to themselves or any specific description of the reader - implicit.
- What was the writer's tone?
  - Markers: relational and engagement markers, person markers and self-mentions, hedge words, and diminutives.

- Did the writer express inclusion, discrimination, or stigma?
  - Markers: words of implicit judgment and sanction, person-first language, pre-/post-modified nouns, gender-neutral/non-binary/gender-inclusive words.
- Were the choices of action clear?
  - Markers: imperatives and modal verbs, clauses, and expressions.

Once the discourse analysis using the ELF-W was completed, statistical analysis was performed using R (R Core Team 2021) and RStudio (RStudio 2021) to normalize the data and detect any significant findings. The mean proportion with 95% standard error took the disparate sub-corpora sizes into account, providing a clearer picture of the dispersion and a visual form of comparison between the six sub-corpora without indicating significance. Normalizing the data also occurred in fitting generalized linear models.[3] Binary dependent variable data for the results of identity of the writer and of the reader was analyzed using generalized linear models with binomial distribution, where the binary data was converted into zeros and ones in the process of fitting the model. To compare between the three non-translated language sub-corpora, the linear models used chi-square tests (with *p*-value), which were applied to each of the sets of markers for each ELF-W question. To compare between non-translated and translated sub-corpora within each of the three languages, an omnibus test and pairwise contrasts (β coefficient and *z*-score with *p*-value) were computed, accompanied by Cohen's *d* for effect size.

3 Results and discussion

This section reveals the key findings of the study, marker by marker, regarding writer-reader relationship in the non-translated English, Spanish, and Catalan sub-corpora (Table 2), along with a comparison between the Catalan non-translated and translated sub-corpus (Table 3). The statistical and qualitative results are applied towards answering the research question.

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[3] In language sciences research, the data tends to not be generated from normal distribution. Thus, the need for generalized linear models – which are more flexible than linear models – which contain only fixed effects (normal explanatory variables).

Table 2: Statistical analysis comparing between the three non-translated sub-corpora[4]

	Chi-square	P	Contrast	Cohen's *d*	Significance
Hedge words	7.122	0.028	EN>CA	0.989	0.049
			CA>ES	0.435	1.000
			EN>ES	0.554	0.588
Relational or engagement markers	4.377	0.112	EN>CA	1.348	0.123
			ES>CA	1.261	0.470
			EN>ES	0.086	1.000
Inclusion words	3.441	0.179	EN>CA	0.249	1.000
			CA>ES	0.909	0.252
			EN>ES	-0.660	0.319
ID writer explicit	0.100	0.951	CA>EN	-1.965	1.000
			CA=ES	-2.324	1.000
			EN=ES	0.359	1.000
ID reader explicit	4.391	0.111	CA=EN	-0.788	1.000
			CA=ES	-2.890	0.129
			EN=ES	2.102	0.213
Deontic modal verb or clause or expression	1.699	0.428	EN>CA	0.349	1.000
			ES>CA	0.724	0.592
			EN>ES	-0.375	1.000
Imperatives	1.215	0.545	EN>CA	0.451	0.824
			CA>ES	0.386	1.000
			EN>ES	0.066	1.000
Negative imperatives	3.372	0.185	EN>CA	0.082	1.000
			ES=CA	0.837	0.387
			EN>ES	-0.755	0.238

Table 3: Statistical analysis comparing between the Catalan non-translated (L1) and translated (L2) sub-corpora

	β	SE	z	p	Contrast
Hedge words	0.005	0.002	2.825	0.005	L2>L1
Relational or engagement markers	0.016	0.017	0.904	0.366	L2>L1
Inclusion words	0.001	0.001	0.985	0.324	L2>L1
ID writer explicit	-22.72	4689	-0.000	1.000	L1>L2
ID reader explicit	-1.099	1.714	-0.640	0.522	L1>L2
Deontic modal verb or clause or expression	0.002	0.004	0.634	0.526	L2>L1
Imperatives	-0.001	0.001	-0.665	0.506	L1>L2
Negative imperatives	0.000	0.000	0.321	0.748	L2>L1

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[4] EN = English, ES = Spanish, CA = Catalan.

3.1 *Hedge words*

Hedge words are one of the pragmatic markers in response to the question in the ELF-W instrument regarding the tone of the text. The writer establishes this tone to reflect the relationship between himself and the reader, who is expected to take responsibility for action. Hedge words, which comprise words of indetermination or depersonalization, epistemic auxiliary verbs, adverbs, and adjectives, are interpersonal metadiscourse devices that can indicate the writer's lack of full commitment to a statement through the expression of possibility and tentativeness (Salager-Meyer 2011).

Hedges were the only writer-reader relationship marker with significant results in the comparison between both the three non-translated sub-corpora and between the Catalan non-translated and translated sub-corpora. The English non-translated texts had significantly more hedge words than the Catalan non-translated texts (d = 0.989, p = 0.049). There were no significant differences between the Spanish non-translated sub-corpus and either the English or the Catalan non-translated sub-corpus.[5] Future research is warranted to verify whether more hedging in English texts compared with Catalan texts is a cultural trait like the findings in Salager-Meyer's (2011) study, in which English texts contained more hedge words than the Spanish ones. The Catalan translated sub-corpus contained significantly more hedge words than the Catalan non-translated sub-corpus (p = .005). This indicates a lack of cross-cultural adaptation by the translators from the English non-translated sub-corpus. This risks an unnatural writing style in the Catalan translations, since the Catalan non-translated texts contained less hedging.

The hedging aspect of epistemic modality is linked to the writer's own judgment based on limited knowledge (Hyland 1998). The English non-translated sub-corpus contained 191 instances of the word "may" as an epistemic auxiliary verb out of 326 hedges. In the first example (1) from the English non-translated sub-corpus, the United States Department of Health and Human Services (*Testing* 2019) writer does not guarantee that the reader will have to pay for a diagnostic test.

(1)   Depending on where you go, testing **may** be free.

The writer implements the epistemic auxiliary verb "may" to avoid committing to certainty that testing sites offer diagnostic testing free of charge. If the reader desires a free diagnostic test, they will have to search for a testing center that provides fee-free testing. The Catalan non-translated sub-corpus also contains this type of hedging, in this case for the possibility of contracting infectious diseases through risky behavior, such as in the following example from the Generalitat Valenciana (*Recomanacions* 2018) website (2):

(2)   *Si el risc es relaciona amb una exposició sanguínia, vosté **pot** haver estat en contacte amb altres infeccions, com ara hepatitis B o hepatitis C [...]*. (If the risk is linked to blood exposure, you **may** have been in contact with other infections, such as hepatitis B or hepatitis C [...].

In the Catalan example, the writer implies using an epistemic auxiliary verb that a risky behavior makes a person more susceptible to certain infectious diseases. There were no

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[5] While this result seems counterintuitive, it is indeed statistically possible.

instances of hedging by using an epistemic auxiliary verb to express possibility in this study's Spanish non-translated sub-corpus.

Naysayers could contend that the writer is not hedging but stating a possibility or an approximation for flexibility's sake. However, one motive for hedging in health information texts is "to gain some protection from the possible criticism" (Zhen 2007: 18) for stating a fact that features uncertainty. In instances concerning whether the reader has been exposed to infection, the writer implementing an epistemic adverb that is not intrinsic to the text or an epistemic auxiliary verb is thus communicating with the reader on the pragmatic level. The writer can confidently list the situations that would put the reader at risk of contagion, however, the writer cannot confirm that one who partook in a risky behavior in fact contracted HIV, or whether the family members of a person with active TB infection are in fact also sick with this disease. The question is whether the writer is truly hedging in the form of modalization to express probability (Eggins 2004) if they do know that contagion is a risk with certain behaviors, but they do not actually know whether the reader who behaved in such a way has been infected, or even if the actual pathogen was present while the reader partook in the risky behavior.

The writer also hedges for mitigation to reduce the intensity (Albelda & Estellés 2021) of alarm that the writer could instill in a reader had the proposition been stated with full confidence; moreover, this metadiscoursal device can result in the reader becoming aware that asymptomatic infections are possible without responding in a panic. In the next example, the writer seeks to assuage without minimizing the reader's concern about contagion. For instance, the writer of the NYC Health website (*HIV testing* 2019) listed the symptoms of a recent infection and stated (3):

(3)   […] if you are experiencing these symptoms after a **possible** HIV exposure.

One text (4) in the Catalan non-translated sub-corpus also reflects the writer's mitigation strategy to address their sense of the reader's concern:

(4)   *[…] des de la **possible** exposició al VIH*. [(…) since the **possible** exposure to HIV.] (Generalitat Valenciana Conselleria de Sanitat Universal i Salut Pública, *Recomanacions* 2018).

While the Spanish non-translated sub-corpus did not contain any epistemic adverbs, epistemic adjectives were present. This form of hedging to express probability, which renders the text less formal in *tenor* (Eggins 2004), is also found in the Catalan non-translated sub-corpus. The following extract is from the Generalitat Valenciana Conselleria de Sanitat Universal (2018) text (5):

(5)   *Si el resultat de l'autotest enfront del VIH és positiu significa que **és probable que** haja detectat que hi ha anticossos enfront del VIH. Per a assegurar-se que el resultat és correcte cal fer proves de confirmació.* (If the result of the self-test against HIV is positive it means that **it is likely** that it has detected HIV antibodies. To make sure that the result is correct it is necessary to do confirmatory tests.)

The English was the only non-translated sub-corpus to feature the projection of hedging onto the reader and contained primarily the epistemic auxiliary verb, using "may" more

frequently than "might" to indicate possibility. The English non-translated sub-corpus also had epistemic adverbs and adjectives. The Catalan non-translated sub-corpus contained a mix of epistemic modality – auxiliary verbs, adverbs, and adjectives – with no prominent type. The Spanish non-translated sub-corpus used epistemic adjectives and lacked epistemic adverbs and auxiliary verbs.

Compared with its non-translated counterpart, the Catalan translated sub-corpus contained significantly more hedging. The results of this study show evidence of a lack of cross-cultural adaptation. This implies that the translators transferred the hedges from the source text. A translated text containing markers that are normally nonexistent or appear infrequently in that language, calls to mind Toury's law of interference: "the more the make-up of a text is taken as a factor in the formulation of its translation, the more the target text can be expected to show traces of interference" (Toury 2012: 312).

While it is prudent to balance between reproducing the source text's overall message along with its linguistic details, the translation ideally contains cross-cultural adaptations (Toury 2012: 311-312) with respect to hedging – and the rest of the markers of concern in this study – so that the resulting text flows naturally for the target reader. Since the Catalan non-translated sub-corpus lacked a hedging preference, a translated Catalan text containing more epistemic auxiliary verbs characteristic of the English source text seems culturally unnatural to the reader.

The next two examples compare between an English non-translated text and its Catalan translation, in which the type of hedging is not cross-culturally adapted. The writer avoids commitment to the interpretation of a positive test or the chances of a false result. The writer might "make a guess" to remove themselves from responsibility for or add subjectivity to the risk of infection or the accuracy of the interpretation of the test results, such as in examples (6) and (7) from NYC Health (*Tuberculosi* 2019; *Tuberculosis testing* 2019):

(6)   A positive test result **usually** means you have TB germs in your body, but you **may** have active TB.

(7)   *Un resultat positiu de la prova **en general** vol dir que té gèrmens de TB en el seu cos, però **pot** ser que hagi tuberculosi activa…* (A positive result of the test **in general** means that you have TB germs in your body, but it **may** be active tuberculosis.)

In example (6), the writer generalizes by using the epistemic adverb "usually" that the positive result of a tuberculosis test indicates that one has the bacteria but does not differentiate between latent and active infection, implying – using the epistemic auxiliary verb "may" – that the reader must obtain a differential diagnosis. As shown in the above Catalan example (7), also using an epistemic adverb and an epistemic auxiliary verb – the translation bears no cultural differences from the original text.

The English non-translated texts featured hedging strategies. The Catalan translated texts reflected this instead of the Catalan non-translated sub-corpus, which does not show a hedging marker preference. These results imply that translators did not culturally adapt the hedging markers from English to Catalan. However, further research using a larger Catalan translated sub-corpus is required to verify these results.

3.2 *Relational & engagement markers*

Relational and engagement markers were among the metadiscoursal markers that pertained to the ELF-W question about the writer's tone. Hyland (2005) defines these as markers that explicitly address the reader to get their attention or to interact with the reader in the discourse. These markers were identified by second-person pronouns and verb forms, inclusive first-person plural pronouns, directives, along with questions and asides that interrupt the ongoing discourse.

There were no significant differences in the use of relational and engagement markers between the non-translated sub-corpora. For this corpus, this indicates that no meaningful cultural differences exist between the three languages regarding this marker. Therefore, relational and engagement markers may not necessarily be a major concern for translators to bear in mind when culturally adapting health information websites on HIV and tuberculosis diagnostic testing from one language into another.

This finding, in a sense, contradicts a discourse analysis by Montero Fleta et al. (2003), which examined the use of relational and engagement along with person markers in academic textbooks and in semitechnical magazines and compared them between the original English and the translated Spanish and Catalan texts. The researchers, who noted that English language semitechnical writing tended to address the reader directly perhaps to resemble the more conversational discourse – found a greater number of relational and engagement markers in the translated semitechnical magazines compared with those of academic textbooks and reasoned that it was due to the more informal writing style and distinct marketing goal of the former genre (Montero Fleta et al. 2003). In the semitechnical texts, Spanish translators removed the English second-person 85% of the time, replacing it with either the third-person passive tense (*se pasivo*) 48% of the time – which was significantly lower than its use in the translated academic textbooks – or the formal second-person or impersonal constructions. They – along with the Catalan translators – retained the first-person plural 75% of the time. The Catalan translators replaced the English second-person form with the third-person passive tense 85% of the time. The study by Montero Fleta et al. (2003) had the same limitation as this study: the Catalan corpus was smaller.

While there were no significant differences between the translated and non-translated Catalan sub-corpora regarding relational and engagement markers, the discourse analysis highlighted the importance of considering the cultural implications of certain pronoun form usage according to each language and including pronoun usage together with verb forms. These are paramount for the success of health information campaigns. For instance, the use of the first-person plural can have different cultural implications depending on the language. Aijón Oliva (2020) noted that the inclusive first-person plural is more prevalent in persuasive discourse, extending beyond the goal of simply transmitting information, as the writer involves the reader in their point of view. "We" could actually imply "you," with the reader as the person responsible for taking action. "We," in this case, is applied as a way to be indirect and avoid an accusatory impression similarly to how scientists write to focus on the paper rather than refer to themselves, especially when their study refutes an earlier one – in short, "to desubjectify the speaker's viewpoint" (Aijón Oliva 2020) while being polite (De Cock 2011). Also, in terms of hierarchy, the use of "we" instead of "you" can be used to minimize power distance between the writer and the reader. For example (8):

(8)   *Conèixer el **nostre** estatus serològic del VIH és senzillament una altra manera de cuidar la **nostra** salut.* (Knowing **our** HIV status is simply another way to take care of **our** health.) (Gais Positius, *Servei* n.d.)

In the above example, "we" actually means "you" as the writer strives for *solidarity* with the reader. The writer places the reader in the former's place, so the latter would reach the same conclusion and get tested (Aijón Oliva 2020). The writers adopted the reader's voice to give the impression of experiencing the same medical situation. Such projection of identity is done by the writers to engage the readers in the narrative and could be used to empower and involve the reader. This finding supports that of a study by Diani's (2019) in that relational and engagement markers were more frequent than person markers and self-mentions in health communication texts. Relational and engagement markers are useful metadiscoursal devices for the writer to directly connect with the reader while informing and persuading them to get tested for HIV and TB.

3.3 *Inclusion words*

Inclusion words pertained to the ELF-W question about whether the text is generalizable to readers in all social strata, age, and ethnic/national groups in the target population. Inclusion words are intended to avoid offense and foment egalitarianism, since the choice of words influences beliefs and attitudes (see, for example, Baker et al. 2022). Such words include non-binary words (instead of words that pertain exclusively to one gender) and person-first language (terms that identify the person before their condition, as opposed to identifying people based only on their condition). Inclusion words enable the writer to express *solidarity* with the reader. The writer may demonstrate respect and display empathy through the way people are named and their treatment of taboo subjects (Martin 1998; Tebble 1999).

No significant differences were found between the non-translated sub-corpora regarding inclusion words. This indicates that the use of such words was approximately the same between the English, Spanish, and Catalan non-translated sub-corpora. While the results can generally be interpreted as inclusion words not being a priority feature that translators would have to be mindful of in their cultural adaptation work on HIV and TB diagnostic testing website texts, it should be standard practice to bear in mind diversity and equity regarding the target audience in the process of transferring the health information from one language to another. Inclusion of population groups – particularly those at risk of stigma and discrimination, whether by the people in their host country or by their linguistic compatriots – within a language community is vital for the reduction of health disparities. Appropriate strategies used by translators result in culturally sensitive texts (Nápoles & Stewart 2018) to which the targeted community responds in the ideal manner.

The most frequently used word in the English and Spanish non-translated sub-corpora was "partner" in English and *pareja* in Spanish. This word does not appear in the Catalan non-translated sub-corpus. "Partner" or "*pareja*" avoids binary gender usage as well as any reference to sexual orientation. The meaning of "partner" in reference to the person with whom one is in a sexual and/or romantic relationship is more neutral, fomenting inclusion and preventing stigma. "Partner," as in "domestic partnership," gained political and legal ground as the LGBTIQ+ community convinced health care providers and employers to recognize their romantic relationships for them to have the same rights as heterosexual couples – so they would be considered "family" in terms of hospital visits and receive the same extended health care

benefits (Kitchener 2019). This abstract non-binary word is more flexible than the awkwardly politically correct "significant other." The writer circumvents potential discomfort and, at worst, offense, and avoid having to assume the reader's marital status – a one-time hook-up, friend with benefits, lover, boyfriend/girlfriend, fiancé/fiancée, or husband/wife/spouse. In addition, the word "partner" enables both the writer and the reader to steer clear of the potential discomfort of the cultural taboos of sexuality, such as non-heterosexuality, promiscuity, and adultery.

Another written expression of inclusion is person-first language, which is a noun that is post-modified by an adjective or an adjectival clause. In Spanish, this is "*persona con/que/de*" (person with/that/of). One example is, "*la persona con VIH*" (person with HIV) (SaludMadrid *VIH/SIDA* n.d.). Nouns can also be post-modified by a descriptive clause. Several instances of this expression of inclusion appeared in the Spanish translated sub-corpus (9):

(9)   "…*personas infectadas por tuberculosis/el VIH*" (…people infected with tuberculosis/HIV).

While person-first language appeared once in the Spanish non-translated sub-corpus and not at all in the Catalan non-translated sub-corpus, that both sub-corpora are small in contrast to the English non-translated sub-corpus should be considered and warrants further research with larger corpora.

3.4 *Identity of the writer & identity of the reader*

The relevance of the clarity of the identity of the writer and that of the reader, per the ELF-W, is that any lack thereof indicates that the website does not have any self-reference or self-identity in the text. The identity of the writer and the identity of the reader form the foundation of *tenor*, which influences the other markers in this study, such as relational and engagement markers. A specific identification of the writer and/or the reader – e.g., self-referring to the organization hosting the website or naming the target audience population – is an indication of explicit identity; otherwise, the identity is implicit with the writer relatively being assumed to be the organization hosting the website and the reader generally being a lay person.

The mean proportion analysis for identity of the writer showed that the Catalan non-translated sub-corpus (62.5%) contained more explicit identity of the writer compared with the English (19.2%) or Spanish (14.3%) non-translated sub-corpus. The Catalan non-translated texts featured more explicit identity of the writer than the translated ones (62.5 percentage points difference). Although the results are not statistically significant, what stands out is that the Catalan non-translated sub-corpus contained more explicit whereas the Spanish non-translated sub-corpus featured more implicit identity of both the writer and the reader. Furthermore, the Catalan non-translated sub-corpus contained more explicit identity of the writer compared with the translated one.

De Cock & Serrano (2017) observed that Spanish and Catalan are similar pro-drop Romance languages with structural and pragmatic differences. Their study hypothesized that Spanish and Catalan usage differed regarding the deictic markers, particularly expressions of politeness, and that the Spanish second person formal pronoun is used more than the Catalan counterpart. De Cock & Serrano (2017) implemented a pragmatic and functional framework and a mixed methods approach to analyze syntactic and pragmatic aspects of person reference

in Spanish and Catalan parliamentary discourse, which the authors pointed out differed from colloquial discourse.[6] Person deictics were more prevalent in Catalan parliament discourse compared with the Spanish. Spanish was shown to feature singular deictics while Catalan tended towards plural forms, including vocatives, along with "a slight preference for less polite address forms" (De Cock & Serrano 2017: 122).

Similarly, the results of this study reveal that the Catalan non-translated sub-corpus contains more explicit identity of the reader; this is done using person deictics. In the next example (10), a Catalan non-profit organization, BCN Checkpoint (*La prova* n.d.) reduces the power distance not only by referring to themselves in the exclusive (as in excluding the reader) first-person plural, but also by addressing the reader individually using a second-person singular pronoun.

(10) *A **BCN Checkpoint** et **facilitem** la prova de detecció de manera ràpida, confidencial i gratuïta*. (At **BCN Checkpoint we** provide the diagnostic test to you so that it is quick, confidential and free.)

Regarding the identity of the reader, the results from this study once again reflect those found in the De Cock & Serrano (2017) study. In example (11) below from a website hosted by BCN Checkpoint (*La prova* n.d.) in Catalonia, the reader is addressed explicitly yet indirectly first as a collective through the use of the inclusive first-person plural and then individually as someone belonging to this collective.

(11) *Els homes gais, bisexuals, i les dones transsexuals **som** especialment vulnerables al VIH per diverses raons d'ordre biològic estructural i social. Per tant, si **ets** una persona sexualment activa, és aconsellable que **et facis** la prova del VIH almenys un cop o dos a l'any.* (**We** gay men, bisexuals, and transsexual women **are** especially vulnerable to HIV for various reasons of a biological, structural, and social order. So, if **you are** a sexually active person, it is advisable that **you take** the HIV test at least once or twice a year.)

The Catalan text implements the inclusive first-person plural pronoun (i.e., a relational or engagement marker), identifying the writers as a collective of gay men, bisexuals, and transgender women. Then the writers address the reader directly using the second-person singular pronoun – a relational or engagement marker – assuming that the reader is like the writers. The target reader's identity is clear: an individual who belongs to a vulnerable collective who might partake in sexual activities that put them at risk for contracting HIV.

The next example (12) demonstrates an implicit identity of the writer with a reduction in the power distance by addressing the reader individually with the informal second-person singular conjugation.

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[6] Parliamentary discourse is formal and conducted under stringent regulations. De Cock & Serrano (2017) applied the definition by Briz (1995) which included a casual setting, daily life situations, equality between speakers, and the topic does not concern a professional matter.

(12)   ***Puedes*** *realizar estas pruebas de forma gratuita en una clínica de salud sexual, en la consulta del médico de cabecera o en un centro comunitario de detección.* (**You can** get these tests for free in a sexual health clinic, in the primary care physician's office, or at a community testing center.) (Grupo de Trabajo Sobre el Tratamiento del VIH, *75,* n.d.)

These examples reflect the findings in this study are like those by De Cock & Serrano (2017) – that the non-translated health information websites in Catalan tended to use plural person deictics while the Spanish counterpart was more likely to implement the singular. The two ELF-W questions – concerning the identity of the writer and that of the reader – address the foundation of the *tenor* of the text on which persuasion, relational and engagement markers are based. This is vital information for rendering multilingual health information websites that are adapted to reflect not only the culture of the reader but also that of the writer in terms of power distance.

3.5 *Deontic modal verbs, clauses, & expressions*

Modal verbs, clauses, and expressions of the deontic obligation type were among the markers that answer the ELF-W question concerning the clarity and unambiguity of the choices of action. Their use in the lexicogrammatical process of polar – in terms of positive or negative – appraisal can reflect *power* and status as social indicators of *tenor*. Based on mean proportion, the Spanish non-translated texts had more modal verbs, clauses, and expressions (1.20%) compared with the English (0.89%) or Catalan (0.65%) counterparts. The translated Catalan sub-corpus contained more than the non-translated one (0.17 percentage points difference), which may reflect a transferal from the Spanish and English non-translated texts, thus a lack of cross-cultural adaptation, regarding the frequent use of modal verbs, clauses, and expressions.

3.6 *Imperatives*

Imperatives,[7] which serve the purpose of direct appeal (Hoey 1991) as either an order or a suggestion (Portner 2007), were among the markers to answer the ELF-W question whether the choices of action were clear and unambiguous. Based on the mean proportions, the English non-translated sub-corpus (0.87%) had more imperatives than the Spanish (0.78%) or the Catalan (0.33%) counterparts. While there is a sizable percentage difference between the Catalan non-translated sub-corpus compared with the other two languages, it is not statistically significant. The Catalan non-translated sub-corpus had more imperatives compared with the translated one (0.13 percentage points difference). Whether translators changed a verb from the imperative to a different tense or replaced it with deontic modals, and whether this reflects cross-cultural adaptation, warrants future research.

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[7] Imperatives also signal relational or engagement markers. The difference is whether the writer explicitly addresses the reader to builds a relationship (Hyland 1998, & Ho 2016) or directly appeals to the reader to heed the call to action (Hoey 1991).

3.7 *Negative imperatives*

Negative imperatives also served in response to the ELF-W question whether the choices of action were clear and unambiguous. As is the case with deontic modals and imperatives, the writer's authority or power status as a social indicator of *tenor* is reflected in the use of negative imperatives; the writer chooses between the polar choices (Tebble 1999) to persuade the reader. Between the non-translated sub-corpora, the Spanish (0.13%) contained more negative imperatives than the English (0.03%) or Catalan (0.03%) ones. The Catalan translated texts contained more than their non-translated ones (0.01 percentage points difference). Even though these differences are minuscule, it is still worth noting that the Spanish was the sole non-translated sub-corpus to contain not only more negative imperatives, but more imperatives and deontic modals.

3.8 *Additional findings and summary*

The discourse analysis revealed that the English non-translated sub-corpus reflected the most *power* and the Catalan non-translated sub-corpus expressed the most *solidarity* with the reader. The Spanish non-translated sub-corpus was in between the two extremes of the social indicators of *tenor*. The use of imperatives, which increased *power* between the writer and the reader, was found in both the English and the Spanish non-translated texts. The English non-translated texts implemented imperatives along with second-person pronouns. The Spanish non-translated texts contained the most negative imperatives, along with inclusive first-person pronouns and singular person deictics. The Catalan non-translated texts featured plural person deictics via the most explicit identity of the writer and that of the reader.

Additional differences were found between the two Catalan sub-corpora. The Catalan translated text had more negative imperatives than the non-translated counterpart, reflecting the non-translated Spanish texts. Also, like the Spanish non-translated texts, the Catalan translated texts had implicit identity of the writer and reader. The Catalan translators used formal second-person pronouns, which contrasted with the non-translated Catalan texts' usage of *solidarity*-boosting first-person plural pronouns to relate to and engage with the readers. The use of formal second-person pronouns was the product of the translation from the English non-translated sub-corpora, in which the relational and engagement markers consisted of imperatives and second-person pronouns. These similarities to the source texts reflect a lack of cross-cultural competence on the translators' part.

There were additional findings in this study. Differences between the three non-translated sub-corpora and between the non-translated and translated Catalan sub-corpora were minuscule regarding person markers and self-mentions, stigma words, and diminutives. This indicates the universality of the implementation strategies of these pragmatic markers in health information websites between the three source languages to convince the reader to get tested for HIV and TB. Also, it was observed that minimal use of self-mentions with a greater use of relational and engagement markers for the writer to connect with the reader, reflecting the findings of Diani (2019). The authoritative *tenor* resulting from the use of imperatives was softened when combined with deontic modal verbs, clauses, and expressions. Finally, the use of inclusion words was indicative of the writer and translator reducing power distance and boosting *solidarity* with the reader.

4 Conclusions

To answer the research question regarding writer-reader relationship, the English non-translated sub-corpus expressed the most *power*. The Spanish non-translated sub-corpus balanced *power* with *solidarity* with the readers. The Catalan non-translated sub-corpus showed the most *solidarity*. The translated Catalan texts showed a lack of cross-cultural adaptation, particularly regarding hedging. Key similarities between the non-translated sub-corpora regarding person markers and self-mentions, diminutives, and stigma words suggest their universal use between English, Spanish, and Catalan.

This study's limitations include sole researcher, an unbalanced corpus, and the sub-categories of "translated" and "non-translated" texts. The sole researcher bias of a subjective textual analysis risks weakening a study. The benefits of a sole researcher implementing an instrument previously used in collaborative investigations is the potential for greater depth and breadth of the study.

Building the corpus resulted in an unequal number of websites per sub-corpus. Most noticeably, the Spanish non-translated and the Catalan translated sub-corpora were disproportionately small compared with the other four sub-corpora. This issue was anticipated and unavoidable. Normalizing the data set for the statistical analysis served to overcome this inequality in the number of texts between the sub-corpora. Nevertheless, the large 95% standard error bars for the Spanish non-translated sub-corpus in some of the mean proportion graphs were a reminder that the results involving the Spanish non-translated sub-corpus should be treated cautiously.

It is important to consider that the sub-category names may mask different subtypes of texts, and thus communication strategies. A "translated" text for Spanish-speaking readers in New York City may cater to a different readership than a "non-translated" text for Spanish-speaking readers in Madrid. Both sets of readers could include Latin American immigrants and other population groups with a varying set of cultural values.

The study's results should be compelling to researchers and professionals in the translation and language sciences, as well as the public health field, for future studies and guidelines to improve the composition of multilingual health information texts. This study contributes to research with a methodology based on a linguistics theoretical framework to evaluate cross-cultural competence in multilingual health information websites. The applicability of this study could be expanded by analyzing other sections of multilingual health information websites, such as the etiology or the prevention of HIV and TB.

Acknowledgements

APPENDIX A: The English non-translated (L1) sub-corpus

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APPENDIX B: The Spanish non-translated (L1) sub-corpus

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APPENDIX D: The Catalan translated (L2) sub-corpus

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