# Book of abstracts

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# Sfruttare modelli linguistici di grandi dimensioni basati su *pretrained generative transformers* per risolvere i problemi di leggibilità dei testi burocratici e professionali italiani

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Il presente contributo si costituisce come uno studio di *Natural Language Processing* (NLP) sui problemi di leggibilità e comprensione di testi professionali e burocratici italiani e sull'uso di modelli linguistici di grandi dimensioni (LLM) per risolverli. Tali problemi sono stati individuati nel 2013 dall'Ente Italiano di Normazione (UNI) con la norma UNI 11482:2013[1], redatta sulla base della letteratura esistente (per es. Raso 2000; Mortara Garavelli 2001; Cortellazzo 2002; Cortellazzo & Pellegrini 2003; Raso 2005; Viale 2008). La norma considera elemento di oscurità alcune costruzioni sintattiche e scelte lessicali divenute endemiche dei suddetti linguaggi come, ad esempio i *periodi lunghi*, ovvero, secondo la norma, formati da più di quaranta parole.
Relativamente alla computazione, la sfida risiede nel semplificare questi elementi mantenendone intatta l'informazione e il lessico tecnico-specifico. Attualmente, per nostra conoscenza, non esistono lavori di NLP sulla norma UNI 11482:2013.

Per l'individuazione dei problemi, lo studio utilizzerà il software WritExp[2] (Acerboni, Branchesi & Panunzi 2016), che, preso in input un testo, etichetta i periodi o i termini considerati oscuri con consigli standardizzati per possibili riformulazioni. L'automatizzazione del *rephrasing* dei periodi e del lessico problematici sarà effettuata attraverso LLM basati su *pretrained generative transformers* (GPT) (Brown et al. 2020), in particolare le interfacce demo online di *ChatGPT*[3] e *Bing Chat*[4], data la loro capacità di effettuare avanzate operazioni di manipolazione e generazione di testo (OpenAI 2023). L'applicazione di questi *task* a testi altamente tecnico-specifici porta con sé problematiche che vanno al di là dell'accuratezza sintattica: l'obiettivo di questo contributo è valutare quanto queste risorse preservino il valore informativo e di senso, oltre che i tecnicismi specifici, degli enunciati sottoposti a rephrasing.

Come caso di studio sono state scelte due delle criticità evidenziate dalla norma UNI 11482:2013: le *frasi lunghe* e l'*eccesso di complementi indiretti rispetto ai verbi*. Un esempio di entrambe le problematiche è il periodo: "Vengono anche esaminate le altre innovazioni apportate dal decreto-legge alla disciplina IVA ed, in particolare, la soppressione di due obblighi dichiarativi per i commercianti al minuto; l'aumento dell'aliquota applicabile ad alcuni servizi radiotelevisivi; la proroga di regimi transitori riguardanti i servizi radiotelevisivi ed i servizi resi tramite mezzi elettronici; la più generalizzata applicazione del regime speciale della vendita di documenti di viaggio e di sosta."
Si prospetta di effettuare test[5] di *prompt engineering* per individuare *prompt patterns* con cui interrogare i LLM (White et al. 2023; Walid 2023). Ogni task affrontato sarà affiancato a un output ideale generato manualmente secondo la norma UNI 11482:2013. I risultati saranno raccolti e valutati sia in relazione all'accuratezza rispetto al task, sia in relazione al prompt utilizzato, così da valutare l'eventuale variazione di accuratezza al variare del prompt.

[1] https://store.uni.com/p/UNI21011931/uni-114822013-112397/UNI21011931_EIT
[2] https://www.writexp.com/
[3] https://openai.com/blog/chatgpt
[4] https://www.bing.com/new
[5] I test saranno effettuati anche sulla base di https://github.com/yokoffing/ChatGPT-Prompts e https://github.com/dair-ai/Prompt-Engineering-Guide

Ci si aspetta che la valutazione evidenzi risultati peggiori rispetto allo stato dell'arte, dovuti alla forte specificità del campo d'applicazione; se così fosse, uno sviluppo auspicabile sarebbe il *fine-tuning* di un LLM con dataset(s) *ad hoc* di coppie istruzioni-output per il dominio della scrittura professionale.

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## Assessing the quality of ChatGPT's generated output: the contribution of textual parameters

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This contribution has an exploratory nature, marking the initial phase of a broader research project aimed at achieving both descriptive and theoretical objectives. The primary goal is to evaluate the quality of texts produced by Language Model Models (LLMs). Two key aspects are examined: the quality of generated texts in comparison to human-authored texts and the identification of distinctive features characterizing this emerging text typology. The analysis is centered on textual parameters, encompassing various phenomena related to text segmentation and three dimensions of text organization (the referential-thematic dimension, the logico-argumentative dimension, and the polyphonic-enunciative dimension). Results of different case studies based on a self-assemble corpus of biographies generated by ChatGPT-3.5 and published on Wikipedia are presented.

Paper available here: https://revistas.uam.es/chimera/article/view/17979/16523

## Potentially manipulative presuppositions in political communication. A comparison between politicians' speeches and ChatGPT-generated texts.

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Human communication is geared toward modifying other people's beliefs and states of mind (e.g., Mercier & Sperber, 2017). Communication can thus be deemed persuasive 'by design'. However, when some conveyed content is non-*bona fide* true, i.e., questionable or blatantly false, persuasion can quickly lapse into manipulation, a type of behaviour which benefits one communication party at the expense of the other(s) (Reboul, 2017). Current research has shown that certain linguistic strategies are more suitable than others to convey (potentially) *manipulative content*, such as implicit communication (Sbisà 2007; Pinker et al., 2008; Lombardi Vallauri, 2019).

Recently, the global success of generative language models has raised many concerns about the manipulative uses of such tools, which are able to maximise the benefits of propagandists in terms of text quality and reach (Goldstein et al., 2023). Moreover, Kreps et al. (2022) have shown that it is very difficult for users to distinguish news articles produced by human agents from text generated by language models such as ChatGPT 2.0.

In this paper, we aim to inquire, on the one hand, the connection between implicit meaning and potentially manipulative content, and, on the other hand, the link between generated texts and manipulative communication. To this end, we will look more closely into political communication, being a communication form that abounds with non-*bona fide* true implicit content (Lombardi Vallauri & Masia, 2014; Garassino et al., 2019). In particular, we will focus on non-*bona fide* true or potentially manipulative presuppositions (henceforth, PPP), as they are well-known to associate with questionable content (Garassino et al., 2019 and 2022).

We compare texts produced by Italian and French politicians with texts generated by ChatGPT 3.5 (OpenAI, 2023) regarding the same topics. These are polarizing issues, hotly debated in the public

sphere: immigration, Covid 19-mass vaccination and same-sex adoption. For each of them, we identify three politicians representing different views on the subject ('in favour' or 'against'). These data are extracted from the IMPAQTS corpus (Cominetti et al., 2022). At the same time, ChatGPT is asked to generate texts representing the same attitude toward the topics, also including 'neutral' texts, which will be used as a benchmark. An example of a prompt is given in (1):

(1) Imagine being an Italian politician **against immigration**. Write a speech for a rally. Write 500 words.

Two text genres are also considered: speeches held in Parliament and at rallies. In each text, presupposition triggers conveying PPPs are analysed, such as definite descriptions, in (2), change of state verbs, (semi)factive verbs, adverbial clauses, etc. (Levinson, 1983).

(2) Questo primo incontro lo dedico a questa riflessione ***sulla mancanza di libertà del cittadino in Italia*** (IMPAQTS, ABON09-N1)
'I dedicate this first meeting to this thought on *the lack of citizen's freedom in Italy*'

This paper is intended to be an exploratory study, whose aim is to provide an answer to the following questions:

a. Does the use of PPPs become quantitatively more prominent when questionable content is involved?
b. Does textual variation play a role regarding (a)?
c. Does ChatGPT produce, on average, texts with more or less potentially manipulative content compared to politicians?
d. Do the frequency and/or content of PPPs vary in relation to the language of the texts generated by ChatGPT?

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# A contrastive analysis of politeness cues in chatbots' first turns

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Across diverse contexts and situations, politeness stands as a universally recognised social norm, shaping expected behavioural patterns in human-human interactions (Brown & Levinson 1987). Over the past decade, the progressive integration of smart agents into various aspects of our lives has paved the way for the investigation of this distinctly human phenomenon in the context of human-machine interactions (Ribino 2023).

In the early stages of chatbot development, the primary goal revolved around ensuring that chatbots could generate coherent and grammatically correct responses. Substantial progress has been achieved in this regard. Nonetheless, many state-of-the-art digital assistants still tend to fail to interact with customers in a natural and engaging fashion (Drift et al. 2018). Using the correct register and displaying politeness in appropriate contexts are key elements for enhancing chatbots' trustworthiness and contributing to the overall success of the interaction (Gretry et al. 2017). For this reason, the present study aims to investigate, through a fine-grained, qualitative, corpus-based approach, politeness cues occurring in chatbots' first turns. A multilingual corpus was created by manually collecting the first turn of 243 virtual assistants operating in the customer service domain (69 responding in English, 68 in German, 56 in Italian, 50 in French) and interacting with users via text-chat on the landing page or the customer support page of different companies, predominantly from the fashion industry. The results of this research study constitute the starting point of a broader investigation that aims to outline the salient linguistic traits of the so-called "chatbot talk" – a potentially distinct new language variety.

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# How do DeepL and ChatGPT deal with information structure and pragmatics? A Case Study of Topicalized Infinitives in Spanish

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The interpretation of the Spanish construction [topicalized infinitive + lexically identical conjugated verb], e.g., *comer no come mucho*, requires particular inferences on the level of pragmatics and information structure (Bastos, 2001; Valenzuela et al., 2005; Reich, 2011; Hein, 2020; Verdecchia, 2021; Muñoz Pérez & Verdecchia, 2022). This construction is typically found in spoken language and especially in colloquial dialogues (Narbona Jiménez, 2015), but can also be attested in written texts, for example in novel dialogues or in social media interactions (corpus evidence from author, in preparation). Therefore, it can be assumed that it is included in the linguistic input for ChatGPT or DeepL. Since this construction has a relatively clearly recognizable pattern (infinitive followed by a conjugated verb form of the same lexeme), it can be supposed to be recognized by the underlying algorithms.

The question of whether and how this construction is processed and/or reproduced or translated by DeepL and ChatGPT is intriguing for several reasons:

1. The construction presupposes a certain context in which the interlocutors share a common ground and in which the topicalized verb is already present in the conversational context. According to Muñoz Pérez and Verdecchia (2022), the infinitive explicitly names the Question under Discussion (=QUD). For example, the construction is often used as a reaction to something previously said (usually to contradict). It is questionable whether such a situation even arises in an artificial "conversation" with ChatGPT.
2. The construction often invites pragmatic inferences: *estudiar sí que estudié* opens up several possible contextual inferences, such as, for example, *pero aún así no aprobé*. It remains to clarify whether AI can draw such pragmatic inferences.
3. Regarding information structure, the infinitive expresses the topic, but it is not introduced by topic markers such as *en cuanto a* or *respecto a*. Therefore, the question arises whether and how ChatGPT and DeepL deal with topics that are not explicitly marked.

Two experiments are carried out to respond to these questions and the following results can be expected on the basis of a small pre-test:

In a first experiment, Spanish corpus examples are being translated by DeepL into Portuguese. In Portuguese, a formally and pragmatically equivalent construction exists (e.g., Pt. *fazer, eu faço*).

However, DeepL does not seem to recognize the construction so far and does not render the infinitive in Portuguese, even if word-to-word translations were possible.

In a second experiment, ChatGPT is tested to see whether it can correctly interpret utterances with this construction and whether it can provide information about its functions on a metalinguistic level (for the method, see also Ortega-Martín et al., 2023). Initial results show that ChatGPT can actively produce such examples when instructed to do so, but attempts to elicit spontaneous linguistic examples by ChatGPT have so far failed. Furthermore, the program tends to be unable to "interpret" the utterances: when asked about its usage, ChatGPT produces misleading explanations (cf. the "overconfident answers" of ChatGPT on linguistic ambiguity, Ortega-Martín et al., 2023). Also, ChatGPT's responses to utterances containing topicalized infinitives indicate that no pragmatic inferences are drawn.

In general, DeepL (and probably ChatGPT, too) does not seem to consider information structure in the translated texts: non-canonical word order, such as *tonto no es*, are translated with canonical syntax (Ger. *er ist nicht dumm* instead of *dumm ist er nicht*). Hence, information structure may not be taken into account and may even get "lost" in AI-generated texts, since the algorithms form sentences according to canonical (and more frequent) word order patterns.

The goal of these two experiments is to compare natural (conversational) language with AI-generated language when it comes to pragmatics and information structure, and to discuss limitations of AI-generated texts: not all features of natural language interaction can be interpreted and imitated (so far).

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# Comparing Aspects of Semantic Bleaching in Machine Translation and Human Translation: A Case Study on Italian Translation Equivalents of German Modal Particles

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The translation of German Modal Particles (MPs) into the Romance languages has been an important field of investigation over the last few decades (Métrich/Heinrich 2016, Sinner 2017). These comparative studies have often been based upon the argument that MPs mainly represent a peculiarity of continental Germanic languages and that the semantic and pragmatic effect of the German MPs had to be expressed by alternative discursive strategies, serving thus as functional Romance equivalents of German MPs (Waltereit 2006). In fact, the existence of MPs in the Romance languages has been controversially discussed in a large amount of literature. However, more recent empirical works on French (Meisnitzer/Wocker, 2017), Spanish (Meisnitzer/Gerards 2016) and Italian (Coniglio 2008, Thaler 2022) have confirmed the occurrence of MP-like lexemes in certain interactional uses, even though these languages do not feature a MP paradigm. As foreign consciousness aligners, MPs express interactional modality and help to establish a common ground of knowledge between the speaker and the hearer (Repp 2019). MPs are polyfunctional elements, i.e. they have homophonous counterparts in other word classes (e.g. adverbs), which have a lexical meaning and represent the source lexemes from which the MPs have descended during a process of language change (pragmaticalization). As a result, MPs have lost semantic substance, but at the same time they have gained pragmatic and illocutionary force.

The purpose of this contribution is to examine the automated neural machine translation of MPs and to compare it to human translation. The quantitatively-oriented analysis focuses on the Italian translation equivalents of the German MPs *eben* and *einfach*, which have similar procedural meanings, since the speaker uses both MPs to underline the evident character of his/her utterance (Thurmair 1989). However, the MPs show substantial differences in terms of foreign consciousness alignment. With *eben*, the speaker signals that the information provided is not only obvious to him/her, but also to the listener (*An Weihnachten sind eben alle Geschäfte geschlossen*). With *einfach*, in contrast, the speaker implies that the information is only evident to him/her, but seemingly not to the listener (*Ich habe einfach keine Lust ins Kino zu gehen*). *Eben* and *einfach* display different degrees of semantic bleaching, which in turn correspond to different degrees of pragmaticalization (Authenrieth 2002). The contrastive study is based on a German-Italian translation corpus of literary texts as well as on the automated neural machine translations of these literary texts provided by *DeepL* and *Google Translate*. Following Schoonjans/Feyaerts (2010), the comparison of the results obtained

will show how human and automated neural machine translation reflect the different degrees of semantic bleaching and thus pragmaticalization of the two MPs. Referring to Meier (2022), it will also be discussed to what extent human and automated neural machine translation provide information on the emergence of Italian MPs.

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# La descrizione delle donne nell'era digitale: femminilizzazione e neutralizzazione nella traduzione automatica dall'inglese all'italiano

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Con l'introduzione delle reti neurali e grazie alla crescente potenza di calcolo delle macchine, la qualità della traduzione automatica (TA) è migliorata parecchio, anche se permangono ancora «tassi elevati di errori traduttivi. Le problematiche sono molteplici e sono principalmente legate alla complessità e alla ambiguità del linguaggio naturale, nonché alle difficoltà legate alla traduzione in sé nel passaggio da una lingua ad un'altra» (Monti 2017: 412). Come sottolineato in recenti studi (tra i quali Monti 2017, Marzi 2021, Pescia 2021), una delle difficoltà della TA è quella di tradurre in modo appropriato elementi linguistici che rimandano al genere femminile del referente. E proprio da questa difficoltà prende spunto questa ricerca, che ha lo scopo di osservare e di analizzare linguisticamente testi biografici riferiti a donne e tradotti con la TA dall'inglese all'italiano (e, parzialmente, al francese). La scelta dell'inglese come lingua di partenza è legata alle sue caratteristiche morfologiche che la distinguono, rispetto alla marcatura grammaticale di genere, dalle lingue romanze.

Alla base delle analisi c'è una banca da che raccoglie, a tutt'oggi, brevi testi biografici su circa 150 donne nate e/o morte nel XX secolo e il cui profilo appare in italiano, inglese e francese nell'enciclopedia online Wikipedia. Si tra3a di una raccolta eterogenea, che non intende proporre in nessun modo un giudizio di valore nei confronti delle donne incluse o di quelle escluse, ma che cerca di coprire quante più professioni, titoli, cariche possibili. Da questi pro6li abbiamo estrapolato le descrizioni iniziali in inglese e le abbiamo tradotte in italiano, e parzialmente in francese, sia con Google Translate sia con DeepL. L'esistenza di un testo in italiano e francese riferito alla stessa persona permette inoltre un confronto tra il testo tradotto e quello non tradotto.

L'obiettivo è quello di studiare da un punto di vista qualitativo e quantitativo come venga attualmente reso il genere quando riferito a donne, sia nel caso di agentivi di uso più o meno recente come ministra o sindaca, sia cercando di capire quali siano gli elementi della frase e del testo che contribuiscono ad una corretta traduzione del genere grammaticale. Si intende anche riflettere sulle difficoltà che la TA incontra nella traduzione del genere dall'inglese all'italiano e sull'eventuale esistenza di modelli che permettono la realizzazione di frasi italiane perfettamente formate.

Da alcune analisi preliminari è emersa l'importanza del contesto di frase, che grazie a "spie" lessicali e gramma cali, tra le quali pronomi personali e parole come ad esempio 'moglie', 'madre', perme3e di inserire nella traduzione in italiano, anche se non in modo sistematico, la marcatura di genere anche a livello lessicale (Pescia 2021: 107).

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# DeepL traduce Maraini. Le poesie metasemantiche sotto gli "occhi" della traduzione computerizzata

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Nell'agosto del 2017 la Start-Up tedesca DeepL lancia un nuovo traduttore automatico online, che si rivela essere fin da subito una delle macchine traduttive più efficaci e precise del web. Basandosi sulla cosiddetta Convolutional Neural Network (CNN o Convnet), DeepL Translate può in determinati casi raggiungere risultati più convincenti di quelli ottenuti dalla Recurrent Neural Network (RNN), utilizzata ad esempio da Google Translate.

Il presente studio riflette sulla possibilità che il ConvNet, il cui pattern di connettività neurale segue l'organizzazione della corteccia visiva animale, sia più adatto a interpretare testi letterari caratterizzati da neologismi, parole nonsense e onomastica inventata. Ne è un chiaro esempio la poesia metasemantica della raccolta Gnosi delle Fanfole di Fosco Maraini. Nell'opera dell'autore fiorentino, il lessico italiano viene intervallato da parole inventate che, inserite nel contesto più ampio delle poesie e della raccolta stessa, rimandano il lettore a componenti morfologiche e fonetiche conosciute, ma spesso non identificabili come tali.

Inserendo l'intero testo della famosa poesia Il lonfo all'interno del traduttore online, questi riconosce pattern cognitivi probabilmente più affini al simbolismo evocato dai caratteri morfologici e fonologici delle non-parole utilizzate dall'autore, e rende questi stessi pattern in lingue non-romanze. I versi "e quasi quasi in segno di sberdazzi / gli affarferesti un gniffo" vengono rispettivamente tradotti con il tedesco "und fast als ein Zeichen des Spottes / würdest du ihm eine Ohrfeige geben" e l'inglese "and almost as a sign of mockery / you would give him a slap in the face". La ConvNet sembra pertanto associare sberdazzi* all'italiano sberleffo e al tempo stesso riconoscere una similarità fonetica tra gniffo* e l'italiano schiaffo. Macchine traduttive basate sulla RNN presentano invece una più forte tendenza a ricopiare termini lessicali non riconosciuti. Google Translate, ad esempio, rende gniffo* con l'inglese gniff* e, ancor più curiosamente, traduce addirittura sberdazzi* con il tedesco Ohrfeige

(it. sberla), non riuscendo ad individuare una connessione semantica appropriata con la precedente componente fraseologica in segno di -.

Se da un lato il RNN "rispetta" il carattere letterario dell'opera e "preserva" l'essenza del testo originale, dall'altro il ConvNet mette in evidenza proprietà del testo più nascoste, quali ad esempio l'iconismo morfosintattico ed il simbolismo fonetico. Il meccanismo che porta a prestare attenzione a tali componenti testuali non è del tutto trasparente, ma risulta a primo impatto più vicino alla interpretazioni testuali fornite dal lettore madrelingua italiano. Il testo finale nella lingua target è chiaramente lontano da una possibile traduzione o trasmutazione letteraria. Tuttavia, indica talvolta la direzione verso la quale muoversi, qualora ci si volesse avventurare nella reinterpretazione di simili testi.

La ricerca si ripropone pertanto di dimostrare, tramite lo studio dell'intera raccolta poetica Gnosi delle Fanfole di Fosco Maraini, come il ConvNet dia la possibilità di ottenere una traduzione più efficace dei testi caratterizzati dall'uso di neologismi, occasionalismi e creazioni fraseologiche originali.

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# Can ChatGPT talk like an older adult?

How ChatGTP generates age-specific linguistic variants when prompted with real speaker metadata and metalinguistic knowledge

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While the specifics of ChatGPT's training-data composition remain undisclosed, it is acknowledged that it comprises a vast quantity of diverse internet sources (Dwivedi et al., 2023). The resulting problem of a black box behind the scenes of ChatGPT becomes more challenging when it comes to the language of older adults, a speech group known to be underrepresented on the internet in comparison to other age groups (Hölig and Wunderlich, 2022). This results in a scarcity of informal language data produced by older adults and raises the question of ChatGPT's proficiency in utilising and describing language variants that characterise older age groups.

This research endeavours to investigate if ChatGPT (3.5.-turbo) (1) can align its responses with the characteristics of age-related language use of contemporary French, and (2) whether it has explicit knowledge of age-related linguistic variation. We then ask (3) if the instruction to adjust the answer given in (1) results in different linguistic choices if the model is additionally prompted with the results from (2).

For this study, ChatGPT generated responses, with the instruction to adopt the perspective of three speakers answering the same two questions in different years (i.e., 2005, 2012, and 2015 or 2023) and thus at different speaker ages. The questions ChatGPT was prompted to answer revolve around the interviewees' past Christmas traditions and their future projects. These contexts elicit the use of *on*/ *nous* and inflected future/ periphrastic future and create a forced choice scenario between the respective variants. As input, ChatGPT was provided with metadata and contexts generated from real responses from the LangAge corpus (El Sherbiny Ismail et al., 2022), without being explicitly prompted to use informal speech. Additionally, we tasked ChatGPT with modifying the first answer according to the previously generated linguistic knowledge (Xu et al., 2023).

The variants used to measure age-specific variation are, first, the personal pronouns *on* and *nous* as 1st person plural subject-clitics, the latter being less frequent in contemporary French and preferably used by older individuals (Coveney, 2000). Second, we explore the opposition between the inflected and the periphrastic future tense i.e., formed by *aller* + infinitive of the verb, which has replaced the inflected future in contemporary French, particularly in Montreal French and to a lesser extent in Hexagonal French (Roberts, 2012). As a result of age-graded variation, but also due to retrograde lifespan changes (Sankoff and Wagner, 2020), the use of the inflected future in affirmative clauses (e.g., *nous partirons* 'we will leave') increases at the expense of the periphrastic future (e.g., *nous allons partir* 'we are going to leave') in the speech of the older population.

As a result, we observe a decrease in the ratio of the most formal variant (statistically significant in the case of *nous* over *on*) from the first answers (1) to the third answers (3), produced by ChatGPT after expert knowledge prompts (2). Moreover, the rate of change of *nous* from (1) to (3) increases significantly between the first and the last interview (2005 vs. 2015/23) for the younger ChatGPT speakers (i.e., born in 1933 and 1942). By contrast, no significant change is discernible for the older chatbot narrator (born in 1931) and for the future tenses.
It remains unclear, whether age is the decisive variable for these changes. For in addition to predominantly acceptable representations of linguistic knowledge, ChatGPT also generates

unverifiable hallucinations. Both the verified linguistic knowledge and the hallucinations generated in (2) can be causal for the differences between (1) and (3).

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## Neural Machine Translation in Health Communication

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The use of Neural Machine Translation (NMT) in public health communication holds an enormous potential: it is easily available, inexpensive and can achieve a substantial increase intranslational efficiency (cf. Macken et al. 2020). This makes it particularly useful in crisis situations where rapid dissemination of reliable information is crucial. But at the same time, NMT also bears great risks due to its high susceptibility to subtle but serious errors (cf. Isabelle et al. 2017). The doctoral research project presented hereafter therefore aims at describing efficient and low-risk ways to implement NMT in public health communication. It focuses on texts published by the World Health Organization in the context of the Covid-19 pandemic and takes four languages (EN, FR, ES, DE) as well as two state-of-the-art NMT systems (DeepL, Google Translate) into account.

The study itself consists of two parts: 1) an analytical phase designed to assess general translation quality and identify potential error sources and 2) a productive phase designed to develop and test

optimization strategies in order to minimize risks and increase efficiency. At the AiRom conference, results from the analytical phase would be presented together with some preliminary findings from the productive phase. The analytical phase encompasses a comprehensive corpus analysis through a triangualtion approach including both quantitative and qualitative methods. In a first step, two automated quality evaluation metrics – BLEU and COMET (Papineni et al. 2002; Rei et al. 2020) – are used to assess the general translation quality and/or machine translatability of different texts and text types. This preliminary analysis is followed by a fine-grained manual error analysis using the harmonized DQF-MQM error typology[6]. The objective of the manual analysis is not only to identify, classify and analyse errors but also to deduce the most important error sources. The error categories *inconsistent use of terminology* and *mistranslations* for example are most often caused by abbreviations (1) and ambiguity (2):

| Text | Segment | Source Text | Target Text (DeepL) |
|---|---|---|---|
| 164 | 6 | vaccine-preventable diseases (VPD) | maladies évitables par la vaccination (MEV) |
| | 7 | VPD | MEV |
| | 8 | | MVP |
| | 81 | | SPV |
| | 83 | | MPV |
| | 98 | | VPD |
| | 99 | | maladies transmissibles sexuellement |

Ex. 1: Mistranslations and inconsistent use of terminology caused by abbreviations

| Text | Segment | Source Text | Target Text (DeepL) |
|---|---|---|---|
| 139 | 60 | If a mother is confirmed/suspected to have COVID-19 has just coughed over her exposed breast or chest, then she should gently wash the breast with soap and warm water for at least 20 seconds prior to feeding. | Si une mère est confirmée/suspectée d'avoir le COVID-19 et vient de tousser sur son sein ou sa poitrine exposés, elle doit laver doucement le sein avec du savon et de l'eau chaude pendant au moins 20 secondes avant de se nourrir. |

Ex. 2: Mistranslation caused by lexical ambiguity (feeding refers to breastfeeding)

The results of this analysis constitute the basis for the identification of particularly error-prone text passages, texts or text types as well as the development of targeted optimization strategies in the productive phase. These strategies may include the implementation of controlled language, terminology management and pre-, inter and post-editing.

The ultimate objective of this doctoral study is the optimization of human-machine interaction through an ideal task division. It consequently aims at determining which parts of the translation process can be fully automated and which parts require a targeted human intervention in order to ensure an efficient and reliable translation of health information.

[6] Developed by TAUS and QTLaunchPad, available at https://info.taus.net/dqf-mqf-error-typology-template-download [05.04.2023]

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