(Not) Lost in Translation:

Psychological Adaptation Occurs During Speech Translation

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Abstract

While language style is considered to be automatic and relatively stable, its plasticity has not yet been studied in translations that require the translator to "step into the shoes of another person". In the present study, we propose a psychological model of language adaptation in translations. Focusing on an established inter-individual difference marker of language style, i.e., gender, we examined whether translators *assimilate* to the original gendered style or implicitly *project* their own gendered language style. In a preregistered study, we investigated gender differences in language use in TED Talks (N = 1,647), and their translations (N = 544) in same- versus opposite-gender speaker/translator dyads. The results showed that translators assimilated to gendered language styles even when in mismatch to their own gender. This challenges predominating views on language style as fixed and fosters a more dynamic view of language style as also being shaped by social context.

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(Not) Lost in Translation: Psychological Adaptation Occurs During Speech Translation

In an era where we regularly engage with people and ideas that span different cultures and backgrounds, the ability to understand one another – beyond spoken language – is a concern of growing importance. In multilingual contexts, translators are charged with capturing and transferring not only the intended meaning of a message, but also to represent the psychological essence of the original speaker. The task of the "interpreter", then, carries particular significance. While the literature on cognitive factors involved in multilingual translation is well-established (e.g. Schwieter & Ferreira, 2017) the degree to which translation also involves the capturing of rich social psychological dynamics remains largely unexplored.

The Social Psychology of Language Use

The ability to capture key components of people's thoughts and feelings from their language has a rich tradition in psychology (Boyd, Pasca, & Conroy-Beam, 2019). Broadly speaking, the psychological analysis of language differentiates between *what* a person says (language *content*) and *how* a person says it (language *style*; Chung & Pennebaker, 2007). Intuitively, the content of people's language often provides clues as to what they are thinking (Pennebaker, Mehl, & Niederhoffer, 2003). Conversely, function words – small parts of language that are inherently "content-free" – are revealing of a person's thinking style. The rates and patterns at which people use pronouns, articles, or conjunctions, i.e., the language style signature, have been found to be reliable indicators of social psychological phenomena such as attachment style, interpersonal motives, and depression (Tausczik & Pennebaker, 2010). Additionally, one of the best established findings regarding language style differences is *gender* (e.g. Mulac, Bradac, & Gibbons, 2001; Newman, Groom, Handelman, & Pennebaker, 2008; Schwartz et al., 2013).

Language *style* is seen as difficult to consciously monitor and alter due to the automaticity with which function words are generated; this applies not only to the sender of the message, but also

to the recipient, meaning that the ability to monitor one's own and other speakers' function word use is limited (Chung & Pennebaker, 2007).

Psychological Adaption in Translations: Language Assimilation and Projection

Despite the stability of psychological language traits reported in the literature (Boyd, 2018; Boyd & Pennebaker, 2015), social situations require multiple forms of psychological adaptation. Individuals mirror the gestures, behaviors, and language of their conversation partners (Doyle & Frank, 2016; Giles, Mulac, Bradac, & Johnson, 1987; Thomson, Murachver, & Green, 2001); phenomena that occur automatically and have also been referred to as verbal mimicry, or language style matching of function words (Ireland et al., 2011).

When two people interact, they tend to adapt and produce similar language patterns, a process that has primarily been studied in the context of real-time and asynchronous social interactions. Translations, on the other hand, are a whole different story, as there is no direct social interaction. In fact, the question of whether *translators* manage to capture the psychological essence of a message, i.e., its language style signature, has not yet been subject of psychological research. While the primary goal of any translation is to transmit the content of a message, translators may implicitly leave traces of their own psychological style.

In the broader multilingual literature, providers of interpretation services indicated that they usually adapt to different language styles (Hlavac, 2012). Translators may convey subtle qualities of the message, such as the speaker's intent and emotional tone, as well as their gender (Hayeri, 2014). In fact, context-dependent variability in translation styles has been observed, supporting the idea of varying degrees of language adaptation in translations (see Angermeyer, 2009).

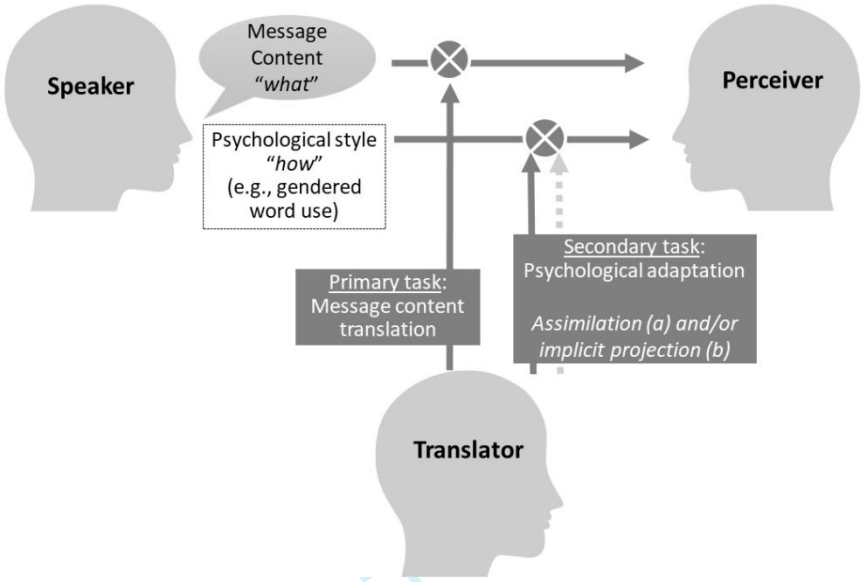

Fig. 1.

The two tasks of translation.

The Psychology of Translation: A Dual-Task Model of Translation

In Figure 1, we present our psychological model of translation that distinguishes between the translation of *what* is being said, i.e., language content (primary task), and the translation of more implicit language features, i.e., *how* the content is put in words (language *style*; secondary task). Beyond content translation, do translators also manage to capture, and assimilate (a) to the original psychological style? Or, does their core focus on content inadvertently lead them to project (b) their own psychological signature onto the translation? Language adaptation may depend on the translator's ability to *monitor* the speaker's and the own language output.

If translators do not fully manage to step into the shoes of the speaker, they project their own psychological style, producing dissimilarity between original and translated language style. Even very simple requests may be expressed in many different ways, stylistically. Whereas the original speaker may have said "Pass the salt, please", a translator might change it to "Would it be possible for you to pass me the salt?", projecting the own, more polite signature onto the message. Ideally however, a translator assimilates to the original message by transferring its exact succinct style onto the translation, and thus providing a translation that is accurate in both content and style.

Assimilation and projection are not mutually exclusive, and might occur simultaneously to a certain degree, e.g., for particular function words.

In the present study, we focused on gender as a well-established inter-individual difference marker in language style to study psychological adaptation in translations and investigated the language categories introduced in the literature (Newman et al., 2008; see "Measures"). Despite the heterogeneity in the specific findings on how male and female speakers differ in their language use, patterns of function word use have been identified as best discriminators between the genders (Argamon, Koppel, Fine, & Shimoni, 2003; Cheng, Chandramouli, & Subbalakshmi, 2011; Schwartz et al., 2013). For example, women often use more pronouns and fewer articles (Argamon et al., 2003; Newman et al., 2008; Schwartz et al., 2013). In the salt example above, many women might thus favor the latter way of expressing the request.

Assimilation versus projection in translations are best observable when translators and speakers do not have the same gender. Does a female translator assimilate to a male speaker's language style? Or does she implicitly project her own, more feminine language style signature?

We studied TED Talks to examine our research questions. TED Talks form a relatively homogeneous speech corpus and the transcripts of original and translated talks are available online. In an initial step, we examined gender differences in TED speakers' language to empirically identify our function word categories of interest. In our main question, we focused on TED Talk translations to examine whether translators assimilate to or project gendered language style in opposite-gender speaker/translator dyads.

To sum up, we investigated the following, preregistered (osf.io/jvp6r) research questions:

RQ 1: Do male versus female TED speakers, as well as male versus female translators, differ in their language use?

RQ 2: Do translators assimilate to the original speaker's gendered language style? Or, do translators rather project their own gendered language style onto the translation? We expected

projection of gendered language style and thus greater differences between speakers' and translators' language styles when they did not have the same gender.

Method

We collected 2,731 transcripts of English TED Talks from the official TED website (https://www.ted.com) in March, 2018, along with the translated German transcript, where available. Since we used the text analysis program LIWC (Pennebaker, Boyd, Jordan, & Blackburn, 2015) that contains a recently updated German dictionary (Meier et al., 2018), focusing on the German translations allowed us to analyze language use in a way that is comparable across the two languages.

TED conferences, at which academics, entrepreneurs, artists and a variety of other individuals give short talks about their area of expertise, have enjoyed global popularity with the videos of these talks subsequently being hosted and freely available on the TED website.

TED provides a transcript of the talk in its original language. A community of volunteers translates the talks from the original language into a variety of other languages. TED requires its translators to be fluently bilingual in both languages of translation, to be knowledgeable of the topics covered in the talks, and to learn about their best translation practices (https://www.ted.com/participate/translate). Among these guidelines are recommendations to try to match and emulate the speaker's original tone. Translated transcripts are reviewed by an experienced volunteer and approved by a TED language coordinator before they are published on the website.

TED speakers and translators are credited with a personal TED profile page. We used information from these public profiles to code the genders of speakers and translators. For speakers, the gender they identified with was coded based on the videos, as well as their names, profile pictures and descriptions (personal pronouns) on their profile. Conforming to current practices on gender identity measures (American Psychological Association, 2015), transgender speakers were coded in terms of their identified gender ($N = 5$ in "Full Sample", $N = 1$ in "Translated Subsample").

For translators, we used the available information on their public profiles, such as their first name, picture, and links to personal webpages to infer their gender. If these sources provided inconclusive information about their gender, the corresponding transcripts were not included in our sample.

In general terms, we followed a preregistered sampling procedure and a detailed overview of the steps that resulted in our final sample is provided in Figure 2.

First, only talks with an available translated German transcript were included (N = 2,149, 78.7%). Second, we excluded transcripts of videos which were live performances (N =112) rather than talks in order to keep the context of language homogeneous. Third, we excluded talks for which translator's gender was not clearly determinable (e.g. aliases, unisex names and no profile picture available, N = 44), that included more than one speaker (N = 48) or had a non-human speaker (i.e. parrot, N = 1). Forth, for reliable language use analysis, talks with fewer than 100 words (N = 3) were excluded. These exclusions resulted in a tentative pool of N = 1,941 talks.

One challenge for our analyses was the nesting of speakers and translators: In our preliminary sample of N = 1,941 talks, there were 1,648 unique speakers (539 female, 1,108 male, 1 non-binary) and 599 unique translators (333 female, 266 male). 212 speakers gave more than one talk, and 263 translators translated more than one talk.

For our analyses, we used two samples, each of which was either restricted to the total number of unique speakers ("Full Sample"), or the total number of unique speakers and unique translators ("Translated Subsample"). This represents a conservative approach to avoid non-independence in the data and systematic over-representation of translators with a high number of translations in the analysis. We here describe these two final samples in detail (see Table 1 for a sample overview). Sensitivity analyses revealed that our sample sizes were appropriate for detection of the assumed effects (see "Supplemental Material B" for more information on our power considerations).

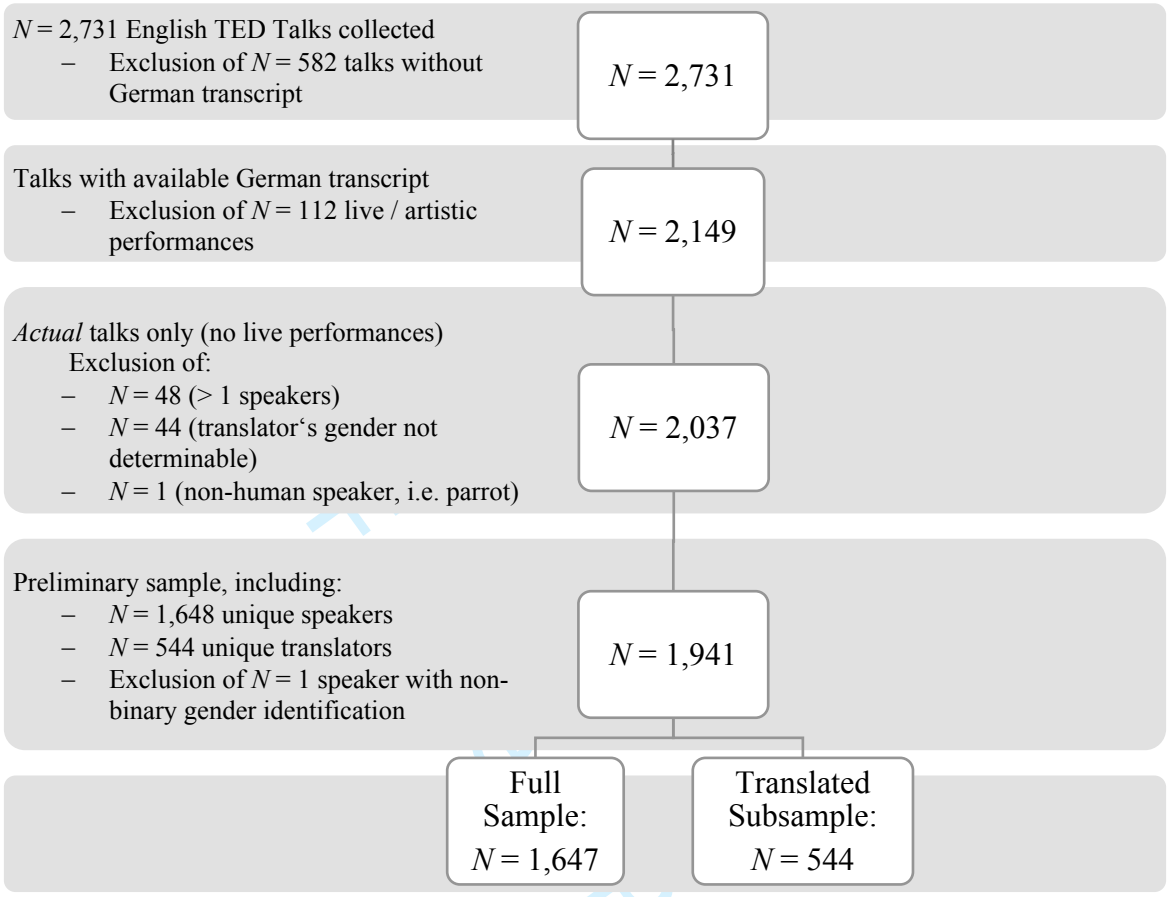

Fig. 2.

Sampling procedure.

"Full Sample"

For speakers who gave more than one talk, we selected one single talk from each speaker (the one with the largest word count). The aim here was to reduce non-independence of this subsample of data while using the most reliable observation in terms of language data. We further excluded one talk from a speaker who identified themselves as outside of the gender binary.

The "Full Sample" thus consisted of 1,647 talks each given by a different speaker. The sample therefore shows a non-nested structure and was used for the analyses in which the original TED Talks, rather than the translations were in focus (RQ1, speakers), i.e., to establish the function word marker of gender differences.

Table 1. Sample overview.

	"Full sample" (N = 1,647 talks)	"Translated Subsample" (N = 544 talks)	
	N Speakers	*N* Speakers	*N* Translators
Total	1,647 (100%)	544 (100%)	544 (100%)
Female	539 (32.7%)	168 (30.9%)	304 (55.9%)
Male	1,108 (67.3%)	376 (69.1%)	240 (44.1%)

"Translated Subsample"

For the talk translations, we undertook an analogous procedure to reduce non-independence of data: As there were 544 unique translators in the preliminary sample, 310 translated one talk each, while 234 translators translated at least two and up to 88 talks. For this remaining nesting of translators in talks, stemming from translators who provided more than one translation, we tested whether there was consequential non-independence in this subset (Kenny, Kashy, & Cook, 2006). For several of our dependent variables, this was the case (see "Supplemental Material A"). Since the majority of translators translated one talk only, a multi-level framework was not feasible here due to lack of within-person variability. We therefore opted for a conservative approach that allows the inclusion of all translators and restricted this sample to the number of unique translators (N = 544, see Table 1). We used the "Translated Subsample" to examine our main research question, where the translations were of interest (RQ2, and RQ1, translators).

Measures

Gender and dyad type. Based upon the gender coding of speakers and translators, we created a dyadic variable representing the genders of both speakers and translators. We coded "dyad type" as 0 = same gender (female speaker/translator, male speaker/translator) or 1 = opposite-gender

(female speaker, male translator / male speaker, female translator). In the "Translated Subsample", there were two different types of same-gender speaker/translator dyads, as well as two types of opposite-gender dyads: $N = 113$ female/female; $N = 185$ male/male; $N = 191$ male/female; $N = 55$ female/male.

Language use. We analyzed the transcripts with the Linguistic Inquiry and Word Count (LIWC2015) in English (Pennebaker et al., 2015), and in German (DE-LIWC2015; Meier et al., 2018). LIWC measures the rates at which psychologically meaningful words occur in a given text, expressing the scores in terms of percentages. For example, the text "I am feeling depressed" would be scored as 25% first person singular pronouns ("I") and 25% negative emotions ("depressed"). The recently developed DE-LIWC2015 contains the same categories as the English dictionary and the comparability of the two dictionaries has been empirically established (Meier et al., 2018).

First, we generally tested gender differences in speakers' language use, which can be seen as a replication of previous findings, in the context of TED Talks. As outlined in the preregistration, we focused on LIWC content and function word categories for which gender differences have previously been found (Newman et al., 2008; Pennebaker, 2011; see Table 2). Furthermore, we included new categories that were added to LIWC in its 2015 version and we expected to differ between genders based on conceptual considerations (Lakoff, 1975; Leaper & Ayres, 2007; Newman et al., 2008). A comprehensive overview of all LIWC variables treated as candidate word categories for gender differences are listed in Table 2 (see "Supplemental Material C" for more information). For our main question, RQ2, psychological adaptation to language *style* was our core interest; we therefore focused on all function word categories for which gender differences were found in RQ1.

Table 2. Preregistered candidate LIWC categories for gender differences as hypothesized

More frequently used by females[a]		More frequently used by males[a]		Others[c]	
LIWC category ("abbrevation")	Examples	LIWC category ("abbrevation")	Examples	LIWC category ("abbrevation")	Examples
Total pronouns ("pronoun")	I, us, itself	Words ≥ six letters ("sixltr")		Total function words ("funct")	it, very
1st person singular ("I")	I, me	Numbers ("number")	one, second	Personal pronouns (ppron")	I, we
3rd person singular ("shehe")	she, he, her	Articles ("article")	a, the	Adverbs ("adverb")	totally. very
3rd person plural ("they")	they, their	Prepositions ("prep")	to, of	Conjunctions ("conj")	and, but
Positive emotions ("posemo")	happy, love	Swear words ("swear")	fuck, dick	Quantifiers ("quant")	few, lots
Anxiety ("anx")	afraid, worried			Anger ("anger")	hate, annoyed
Perception "percept"	look, hearing			Affiliation ("affiliation")	ally, share
Cognitive Processes[b] ("cogproc")	cause, know			Achievement ("achieve")	better, success
Insight[b] ("insight")	realize, think			Power ("power")	glory, superior
Causation[b] ("cause")	because, hence			Informal ("informal")	bullshit, yay
Discrepancy[b] ("discrep")	should, could			Nonfluency (nonflu")	er, hm
Tentative[b] ("tentat")	maybe, perhaps			Fillers ("fillers")	anyway, blah
Certainty[b] ("certain")	always, never				
Differentiation[b] ("differ")	but, else				
Social processes ("social")	talk, buddy				
Present focus ("focuspresent")	now, today				
Home ("home")	kitchen, sofa				

Note.[a] LIWC categories were selected based on previous evidence about gender differences in language use (Newman et al., 2008). We only included categories with an effect size $|d| \geq .15$ in the Newman et al. (2008) sample.

[b]All cognitive process word categories were included in our analysis based on findings summarized in Pennebaker' (2011).

[c]These LIWC categories are new (or substantially revised) to the 2015 version of the LIWC dictionaries and were considered as candidates of gender differences.

Analyses of Preregistered Hypotheses

We provide here an overview of the statistical analyses. All hypotheses were preregistered (available at osf.io/jvp6r)[1]; data, syntaxes, as well as supplementary analyses are available at osf.io/dtf83.

Question 1. Do male and female TED speakers, as well as male and female translators, differ in their language use?

As an initial step, we examined gender differences in word use. We investigated this separately for speakers and for translators relying on multivariate analyses of variance (MANOVAs). This can be seen as a descriptive way of examining whether speakers and translators differed in their word use while accounting for speaker/translator interdependencies (Kenny et al., 2006). Additionally, this approach was used to empirically establish the gendered function word use pattern for our primary question. We used the "Full Sample" for TED speakers; and the "Translated Subsample" for translators. We then recomputed the analysis for speakers in the "Translated Subsample" to cross-validate the effects in the smaller sample.

Independent variables included the genders of speakers (MANOVA 1), and the genders of translators (MANOVA 2), respectively; dependent variables (LIWC scores) are depicted in Table 2. We controlled for length of speech samples by including total word count of the talks as covariates. As initially not all assumptions of MANOVA were met (see "Supplemental Material B"), we log-transformed the dependent variables, which satisfactorily improved homogeneity of variance-covariance matrices. For the interpretation of subsequent univariate test results, and in particular for the establishment of the "gendered language signature", we relied on a conservative level of significance (0.1%). Moreover, whenever possible, we report confidence intervals around estimated

[1] Only the first two of the preregistered hypotheses are within the scope of the present article.

effect sizes. For the univariate $\eta^2_{P,}$ we report 90% confidence intervals, as is recommended in the literature (e.g., Smithson, 2001).

Question 2. Are there greater differences between speakers' and translators' language styles in opposite-gender versus same-gender dyads?

To address our primary research question whether translators assimilate to speakers' gendered function word use even when in mismatch with their own gender, we conducted a MANOVA using a dyad-level variable (difference score between speaker and translator) for each dyad as dependent variables. We chose a difference score of *z*-transformed LIWC scores in order to acknowledge the dyadic pairing of speaker and translator, as well as to partial out potential language-specific baseline differences, following a procedure that has been applied in analyses of gender differences in personality traits across cultures (Costa, Terracciano, & McCrae, 2001). Differences of *z*-transformed LIWC scores ("translator minus speaker") represent deviations in gender-relevant LIWC categories between the original talk and the translation. The difference scores can be interpreted as effect sizes corresponding to Cohen's *d*. Tests of the model requirements are reported in "Supplemental Material B", which led us to abstain from log-transformation of the difference scores.

We included main effects of "gender" and "dyad type" to test whether differences in language use between speaker and translator were different in opposite-gender (dyad type = 1) versus same-gender dyads (dyad type = 0). The full model included a dyad type × gender translator interaction and thus the following possible groupings: Female speaker-translator; male speaker-translator; male speaker-female translator; female speaker-male translator. Again, we included total word count of the talks as a covariate.

Results

Language profiles for all gender-sensitive word categories in original talks and translations are illustrated in Figure 3. Figure 3 suggests that the general language profile of translations strongly

resembled the gender differences found in the original talks, and that translators' own gender differences were diminished. Assimilation then, rather than implicit projection of gendered language use, appears to be the norm for both language content and style during translation; subsequent analyses explicitly tested whether this was the case.

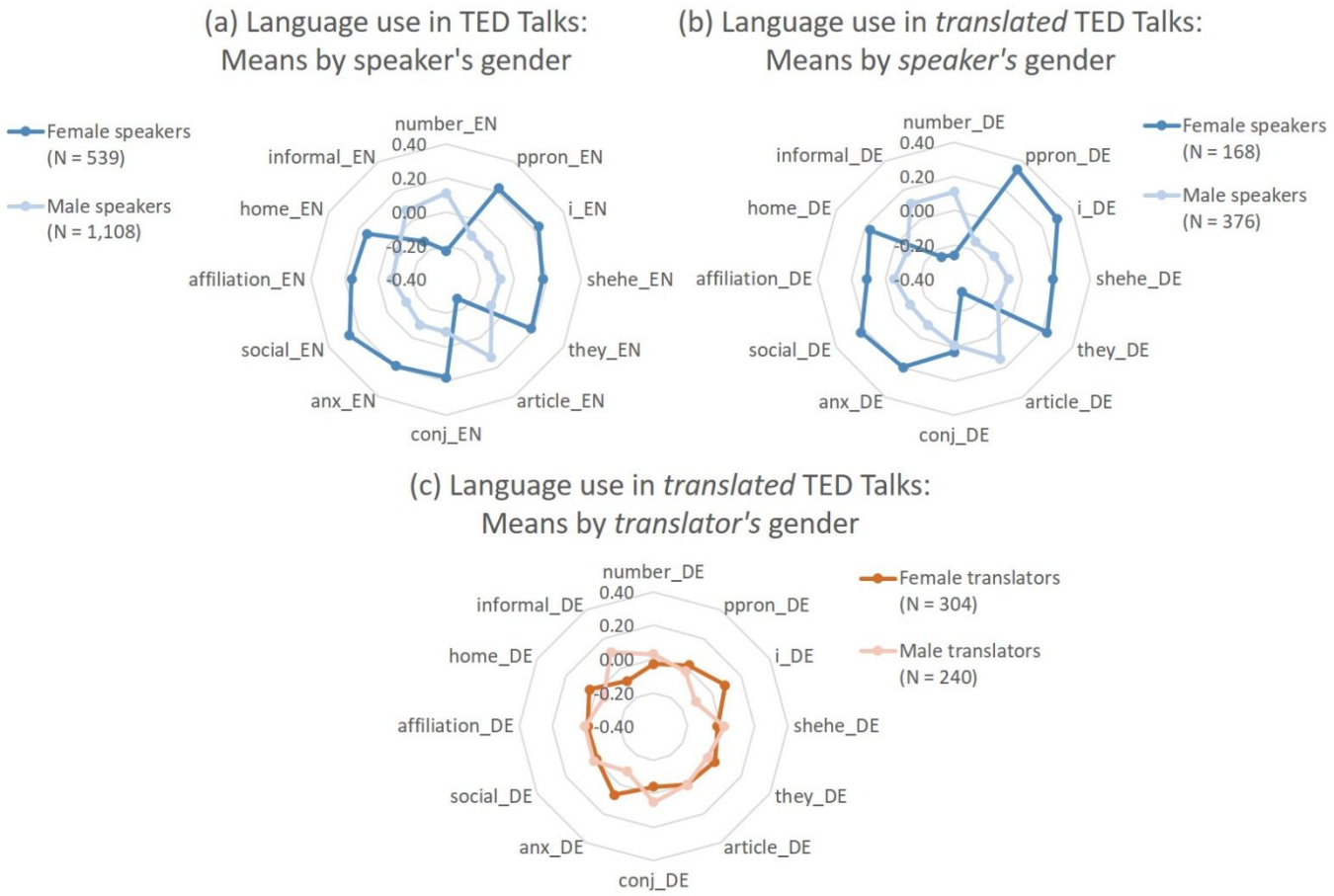

Fig. 3.

Language use profiles in gender-sensitive word categories in (a) TED Talks and (b, c) their translations. Speaker's gender showed a similar language use pattern in (a) the original and (b) translated talks, whereas no clear pattern was evident for (c) translator's gender. Depicted are all categories for which TED speakers showed significant gender differences (p <. 001 in RQ1); all values are means of z-standardized LIWC-scores.

Question 1. Do male and female TED speakers as well as translators differ in their language use?

Regarding the identification of a gender-language signature, there was a statistically significant main effect of speaker's gender in language use, F (34, 1,611) = 9.65, $p < .001$; Pillai's Trace = 0.169, η^2_P =.169. The multivariate effect of the talks' total word count on language use was also statistically significant, F (34, 1,611) = 12.68, $p < .001$; Pillai's Trace = .211, η^2_P =.211.

Descriptives and results of the univariate tests of LIWC categories as a function of speaker's gender are reported in Table 3. Out of 34 dependent candidate variables, 21 LIWC categories showed significant gender differences (p's < .05); 12 were significant at $p < .001$. The inter-correlations between all language variables are reported in "Supplemental Material H".

A parallel MANOVA was performed to replicate gender differences of speaker's language in the "Translated Subsample" (N = 544 talks). Again, there was a statistically significant effect of speakers' gender on language use, F (34, 508) = 3.58, $p < .001$; Pillai's Trace = 0.193, η^2_P =.193. The majority of the univariate gender effects found in the "Full Sample" generalized to the "Translated Subsample". Further details on these supplementary analyses are provided in "Supplemental Material D".

For the translations, there was a statistically significant main effect of "translator's gender", F (34, 508) = 1.72, p = .008; Pillai's Trace = .103, η^2_P =.103. The multivariate effect of the transcripts' total word count on language use was also significant, F (34, 508) = 6.18, $p < .001$; Pillai's Trace = .293, η^2_P = .293. Table 4 shows results of the univariate tests of LIWC categories as a function of translator's gender. Three of the 34 dependent variables in the translations showed significant gender differences ($p < .05$): "I", "informal", and "nonfluency". However, when relying on a more conservative alpha level ($p < .001$) due to heteroscedasticity, none of these variables meet statistical significance.

Table 3. Gender differences in language use in TED Talks for speakers ("Full Sample", $N = 1{,}647$).

	Female speakers ($N = 539$)		Male speakers ($N = 1{,}108$)				
LIWC variable	*M (SD)*	[95% CI]	*M (SD)*	[95% CI]	$F_{(1, 1{,}644)}$	*p*	η^2_P [90% CI[a]]
Words ≥ six letters	18.10 (3.21)	[17.83; 18.37]	17.74 (3.09)	[17.56; 17.93]	1.45	.229	.001 [.000; .005]
Numbers	1.77 (0.75)	[1.70; 1.83]	2.09 (1.02)	[2.03; 2.15]	41.58	<.001***	.025 [.014; .038]
Total function words	55.57 (3.37)	[55.28; 55.86]	55.75 (3.28)	[55.55; 55.94]	0.41	.521	.0003 [.000; .003]
Pronouns	16.22 (3.06)	[15.97; 16.48]	16.00 (2.85)	[15.84; 16.17]	3.95	.047*	.002 [.00002; .008]
Personal pronouns	9.24 (2.79)	[9.00; 9.47]	8.42 (2.38)	[8.28; 8.56]	30.75	<.001***	.018 [.009; .031]
1st person singular (I, …)	3.28 (2.39)	[3.08; 3.49]	2.55 (2.02)	[2.43; 2.67]	35.84	<.001***	.021 [.011; .034]
3rd person singular (she, he, …)	0.90 (1.05)	[0.81; 0.99]	0.66 (0.86)	[0.61; 0.71]	31.68	<.001***	.019 [.010; .031]
3rd person plural (they, …)	1.30 (0.78)	[1.23; 1.36]	1.11 (0.67)	[1.07; 1.14]	30.03	<.001***	.018 [.009; .030]
Articles	7.09 (1.34)	[6.98; 7.21]	7.64 (1.31)	[7.56; 7.72]	58.15	<.001***	.034 [.021; .050]
Prepositions	13.55 (1.51)	[13.42; 13.68]	13.44 (1.42)	[13.36; 13.53]	1.08	.299	.001 [.000; .004]
Adverbs	5.75 (1.23)	[5.65; 5.86]	5.97 (1.28)	[5.89; 6.04]	4.42	.036*	.003 [.0001; .008]
Conjunctions	7.56 (1.28)	[7.45; 7.67]	7.22 (1.25)	[7.14; 7.29]	32.5	<.001***	.019 [.010; .032]
Quantifiers	2.28 (0.65)	[2.23; 2.34]	2.40 (0.68)	[2.36; 2.44]	6.83	.009**	.004 [.001; .011]
Positive Emotions	2.84 (1.10)	[2.75; 2.93]	2.72 (1.05)	[2.66; 2.78]	3.15	.076	.002 [.000; .007]
Anger	0.35 (0.43)	[0.32; 0.39]	0.31 (0.42)	[0.28; 0.33]	5.77	.016*	.003 [.0003; .010]
Anxiety	0.30 (0.37)	[0.27; 0.33]	0.21 (0.27)	[0.19; 0.22]	40.81	<.001***	.024 [.013; .038]
Swear words	0.03 (0.07)	[0.02; 0.03]	0.04 (0.08)	[0.03; 0.04]	2.63	.105	.002 [.000; .006]
Perception	2.58 (1.15)	[2.48; 2.68]	2.69 (1.18)	[2.62; 2.76]	5.5	.019*	.003 [.0003; .010]
Cognitive Processes	11.76 (2.21)	[11.57; 11.95]	11.64 (2.18)	[11.51; 11.77]	3.72	.054	.002 [.000; .008]
Insight	2.61 (0.87)	[2.53; 2.68]	2.49 (0.88)	[2.44; 2.55]	10.11	.002**	.006 [.001; .014]
Causation	2.01 (0.71)	[1.95; 2.07]	2.04 (0.69)	[2.00; 2.08]	0.71	.401	.0004 [.000; .004]
Discrepancy	1.48 (0.58)	[1.43; 1.53]	1.48 (0.55)	[1.45; 1.52]	0.31	.579	.0002 [.000; .003]
Tentative	2.44 (0.82)	[2.37; 2.51]	2.57 (0.84)	[2.52; 2.62]	3.06	.080	.002 [.000; .007]
Certainty	1.40 (0.50)	[1.36; 1.44]	1.39 (0.46)	[1.37; 1.42]	0.4	.528	.0002 [.000; .003]
Differentiation	3.15 (0.85)	[3.08; 3.22]	3.09 (0.83)	[3.04; 3.14]	6.59	.010*	.004 [.001; .011]
Social words	11.04 (3.19)	[10.77; 11.31]	9.89 (2.70)	[9.74; 10.05]	55.83	<.001***	.033 [.020; .048]
Affiliation	3.33 (1.42)	[3.21; 3.45]	3.00 (1.32)	[2.93; 3.08]	20.74	<.001***	.012 [.005; .023]
Achievement	1.51 (0.68)	[1.45; 1.57]	1.48 (0.69)	[1.44; 1.52]	0.49	.483	.0003 [.000; .003]
Power	2.37 (0.99)	[2.29; 2.45]	2.32 (0.96)	[2.26; 2.38]	1.05	.305	.001 [.000; .004]
Present focus	10.74 (2.51)	[10.52; 10.95]	11.35 (2.49)	[11.21; 11.50]	12.08	.001**	.007 [.002; .016]
Home	0.33 (0.32)	[0.30; 0.36]	0.27 (0.30)	[0.25; 0.28]	17.08	<.001***	.010 [.004; .020]
Informal	0.38 (0.34)	[0.35; 0.41]	0.46 (0.38)	[0.43; 0.48]	14.57	<.001***	.009 [.003; .018]
Nonfluency	0.17 (0.18)	[0.15; 0.18]	0.19 (0.17)	[0.18; 0.20]	6.15	.013*	.004 [.0004; .010]
Fillers	0.01 (0.03)	[0.01; 0.01]	0.01 (0.05)	[0.01; 0.01]	0.03	.864	.00002 [.000; .001]

* $p < .05$, ** $p < .01$, *** $p < .001$

Note. Means refer to percentages of the total words used. All LIWC scores were log-transformed prior to analysis. CI = confidence interval. Bounds of CI = .000 correspond to values <.0001.

[a]90% Confidence intervals are reported for η^2_P following the recommendations in the literature (e.g., Smithson, 2001).

Table 4. Gender differences in language use in TED Talks for translators ("Translated Subsample"; $N = 544$).

	Female translators ($N = 304$)		Male translators ($N = 240$)		F		
LIWC variable	*M (SD)*	[95% CI]	*M (SD)*	[95% CI]	$_{(1, 541)}$	p	η^2_P [90% CI][a]
Words ≥ six letters	26.10 (3.55)	[25.70; 26.50]	26.04 (3.79)	[25.56; 26.52]	0.01	.931	.00001 [.000; .001]
Numbers	1.73 (0.75)	[1.64; 1.81]	1.77 (0.90)	[1.66; 1.89]	0.01	.944	.00001 [.000; .000]
Total function words	53.52 (2.92)	[53.19; 53.85]	53.69 (2.89)	[53.32; 54.06]	0.15	.699	.0003 [.000; .007]
Pronouns	17.30 (2.85)	[16.98; 17.62]	17.49 (2.76)	[17.14; 17.84]	0.52	.473	.001 [.000; .010]
Personal pronouns	9.79 (2.63)	[9.49; 10.09]	9.69 (2.60)	[9.36; 10.02]	0.11	.742	.0002 [.000; .006]
1st person singular (I, …)	3.03 (2.34)	[2.76; 3.29]	2.57 (2.09)	[2.30; 2.83]	6.14	.013*	.011 [.001; .030]
3rd person singular (she, he, …)	2.90 (1.14)	[2.77; 3.02]	2.95 (1.23)	[2.79; 3.10]	0.05	.823	.0001 [.000; .004]
3rd person plural (they, …)	1.85 (0.89)	[1.75; 1.95]	1.81 (0.95)	[1.69; 1.93]	0.59	.442	.001 [.000; .011]
Articles	10.96 (1.68)	[10.77; 11.15]	10.96 (1.65)	[10.75; 11.17]	0.04	.849	.0001 [.000; .003]
Prepositions	10.13 (1.35)	[9.98; 10.28]	9.92 (1.32)	[9.75; 10.09]	2.38	.123	.004 [.000; .018]
Adverbs	3.99 (0.79)	[3.91; 4.08]	3.91 (0.85)	[3.80; 4.01]	2.06	.152	.004 [.000; .017]
Conjunctions	12.27 (1.34)	[12.11; 12.42]	12.39 (1.35)	[12.22; 12.56]	0.64	.424	.001 [.000; .011]
Quantifiers	2.96 (0.68)	[2.88; 3.04]	2.98 (0.70)	[2.89; 3.07]	0.03	.873	.00005 [.000; .002]
Positive Emotions	2.94 (0.93)	[2.84; 3.04]	2.87 (0.94)	[2.75; 2.99]	0.92	.337	.002 [.000; .012]
Anger	0.26 (0.35)	[0.22; 0.30]	0.24 (0.28)	[0.21; 0.28]	0.06	.801	.0001 [.000; .005]
Anxiety	0.22 (0.36)	[0.18; 0.26]	0.17 (0.17)	[0.15; 0.19]	2.80	.095	.005 [.000; .020]
Swear words	0.03 (0.07)	[0.02; 0.03]	0.02 (0.05)	[0.02; 0.03]	0.24	.623	.0004 [.000; .008]
Perception	2.07 (0.79)	[1.98; 2.15]	2.05 (0.83)	[1.94; 2.15]	0.18	.676	.0003 [.000; .007]
Cognitive Processes	15.61 (2.39)	[15.34; 15.88]	15.57 (2.20)	[15.29; 15.85]	0.04	.849	.0001 [.000; .003]
Insight	2.55 (0.82)	[2.46; 2.64]	2.52 (0.78)	[2.42; 2.62]	0.13	.724	.0002 [.000; .007]
Causation	2.53 (0.67)	[2.45; 2.60]	2.54 (0.63)	[2.46; 2.62]	0.06	.801	.0001 [.000; .005]
Discrepancy	2.10 (0.56)	[2.03; 2.16]	2.05 (0.58)	[1.98; 2.13]	1.28	.259	.002 [.000; .014]
Tentative	3.07 (0.83)	[2.97; 3.16]	3.06 (0.82)	[2.96; 3.16]	0.08	.782	.0001 [.000; .006]
Certainty	2.94 (0.86)	[2.84; 3.03]	2.97 (0.77)	[2.87; 3.06]	0.27	.602	.001 [.000; .008]
Differentiation	4.23 (0.84)	[4.14; 4.33]	4.26 (0.87)	[4.15; 4.37]	0.05	.832	.0001 [.000; .004]
Social words	13.16 (2.76)	[12.85; 13.47]	13.21 (2.58)	[12.88; 13.54]	0.06	.815	.0001 [.000; .004]
Affiliation	3.22 (1.33)	[3.07; 3.37]	3.25 (1.27)	[3.09; 3.41]	0.16	.688	.0003 [.000; .007]
Achievement	3.50 (0.73)	[3.42; 3.58]	3.47 (0.80)	[3.37; 3.57]	0.33	.569	.001 [.000; .009]
Power	1.53 (0.69)	[1.45; 1.61]	1.60 (0.75)	[1.50; 1.69]	1.10	.294	.002 [.000; .013]
Present focus	5.02 (1.39)	[4.86; 5.17]	5.28 (1.44)	[5.10; 5.46]	3.23	.073	.006 [.000; .021]
Home	0.23 (0.23)	[0.21; 0.26]	0.21 (0.21)	[0.18; 0.24]	1.31	.253	.002 [.000; .014]
Informal	1.38 (0.60)	[1.31; 1.44]	1.52 (0.79)	[1.42; 1.62]	4.07	.044*	.007 [.0001; .024]
Nonfluency	0.02 (0.05)	[0.02; 0.03]	0.04 (0.09)	[0.03; 0.05]	5.10	.024*	.009 [.001; .027]
Fillers	0.03 (0.05)	[0.02; 0.03]	0.03 (0.06)	[0.02; 0.04]	1.04	.309	.002 [.000; .013]

* $p < .05$

Note. Means refer to percentages of the total words used. All LIWC scores were log-transformed prior to analysis. CI = confidence interval. Bounds of CI = .000 correspond to values <.0001.

[a]90% Confidence intervals are reported for η^2_P following the recommendations in the literature (e.g., Smithson, 2001).

Supplementing the preregistered analyses, we recomputed the models for the translations including *speaker's* gender as an independent variable to examine how language use in TED translations differs as a function of the *speakers'* genders. These analyses were treated as preliminary tests of whether speakers' versus translators' gender explains more variance in gendered word use in translations as the visualization in Figure 3 already hinted. Word count of the transcript was a covariate and showed a significant effect F (34, 507) = 5.60, $p < .001$; Pillai's Trace = .273, η^2_P = .273.

There was a statistically significant difference in translated language use based on the translator's gender, F (34, 507) = 1.55, $p = .026$; Pillai's Trace = .094, η^2_P =.094. Moreover, *speaker's* gender represented a significant main effect, F (34, 507) = 3.25, $p < .001$; Pillai's Trace = .179, η^2_P =.179, and accounted for a substantially higher proportion of explained variance (η^2_P =.179) than translator's gender (η^2_P =.094).

In this new model, only one LIWC category showed statistically significant differences based on the translator's gender ("nonfluencies", $p = .025$). For speaker's gender, however, 14 LIWC categories showed significant differences ($p < .05$), five of which were significant at $p < .001$ (for more details see "Supplemental Material E"; and Figure 3 for an illustration).

Summing up, gender differences in language use for the translators were present, but weaker than those for the original speakers; and language use in the translations was better explained by the *speaker's*, rather than the translator's gender, when we included both main effects in the model. Moreover, these first analyses enabled us to establish a function word-based marker of gender, forming the basis of RQ2.

Question 2. Are there greater differences between speakers' and translators' language styles in opposite-gender versus same-gender dyads?

Means and confidence intervals for translator-speaker difference scores are reported in Table 5. Neither the multivariate effect of dyad type (p = .643), nor translator's gender (p = .305) significantly explained the language use difference scores; therefore, the hypothesis that translators implicitly project their own gendered function word use and that opposite-gender speaker/translator dyads show greater differences was not supported. However, there was a statistically significant dyad type × translator's gender interaction effect on the LIWC difference scores, F (7, 533) = 2.39, p = .021; Pillai's Trace = .030, η^2_P = .030. Within the univariate statistics, difference scores for two LIWC variables showed a significant dyad type × translator's gender interaction effect: "conjunctions": F (1, 539) = 5.36, p = .021, η^2_P = .010, 90% CI = [.001, .028], and "articles": F (1, 539) = 4.00, p = .046, η^2_P = .007, 90% CI = [.0001, .024]. Moreover, there was a significant univariate effect of translator's gender on the difference score for "conjunctions" F (1, 539) = 5.26, p = .022, η^2_P = .010, 90% CI = [.001, .028]. The full results of the univariate test statistics, raw means and inter-correlations between language use difference scores, along with supplemental analyses relying on a factor with the four possible groupings of speaker/translator dyads (same gender male/female; opposite gender translator with male/female speaker) are reported in "Supplemental Material F-H".

In line with the main analyses, use of conjunctions in translations was more reduced (relatively to the original transcript) in male/female dyads, compared to male/male dyads; and, in same-gender dyads, when the translator was female, rather than male. Together with the dyad type × gender interaction effect, this hints towards gender-specific tendencies of translators to level out extreme cases of conjunction and article use.

Table 5. Summary information for research question 2: Differences of *z*-transformed LIWC scores "translator minus speaker".

LIWC category (Difference scores)	Same-gender speaker/translator dyads			Opposite-gender speaker/translator dyads			Same- versus opposite-gender dyads:
	Female/female (*N* = 113)	Male/male (*N* = 185)	Total (*N* = 298)	Male/female (*N* = 191)	Female/male (*N* = 55)	Total (*N* = 246)	
	M [95% CI]	*M* [95% CI]	*M* [95% CI]	*M* [95% CI]	*M* [95% CI]	*M* [95% CI]	*Cohen's d* [a] [95% CI]
Numbers	-0.02 [-0.10, 0.06]	-0.04 [-0.10, 0.02]	-0.03 [-0.08; 0.02]	0.06 [0.00, 0.12]	-0.02 [-0.13, 0.08]	0.02 [-0.04; 0.08]	0.19 [0.02, 0.35]
Personal pronouns	0.04 [-0.02, 0.11]	0.00 [-0.05, 0.05]	0.02 [-0.02; 0.06]	-0.03 [-0.08, 0.02]	0.00 [-0.09, 0.09]	-0.01 [-0.07; 0.04]	-0.12 [-0.29, 0.05]
1st person singular (I, …)	-0.01 [-0.04, 0.01]	0.00 [-0.01, 0.02]	-0.01 [-0.02; 0.01]	0.01 [-0.01, 0.02]	0.00 [-0.03, 0.03]	0.002 [-0.01; 0.02]	0.08 [-0.09, 0.25]
3rd person singular (she, he, …)	-0.02 [-0.16, 0.12]	0.08 [-0.03, 0.18]	0.03 [-0.06; 0.11]	-0.05 [-0.15, 0.06]	-0.06 [-0.25, 0.14]	-0.05 [-0.16; 0.06]	-0.12 [-0.29, 0.05]
3rd person plural (they, …)	0.08 [-0.07, 0.22]	-0.01 [-0.10, 0.13]	0.04 [-0.05; 0.14]	-0.07 [-0.18, 0.05]	0.04 [-0.17, 0.25]	-0.01 [-0.13; 0.11]	-0.09 [-0.26, 0.08]
Articles	0.07 [-0.04, 0.19]	-0.04 [-0.12, 0.05]	0.02 [-0.05; 0.09]	-0.04 [-0.12, 0.05]	0.09 [-0.07, 0.25]	0.03 [-0.06; 0.12]	-0.01 [-0.18, 0.16]
Conjunctions	-0.18 [-0.34, -0.03]	0.19 [0.07, 0.31]	-0.004 [-0.09; 0.10]	-0.06 [-0.18, 0.06]	-0.06 [-0.28, 0.15]	-0.06 [-0.19; 0.06]	-0.11 [-0.28, 0.06]

Note. CI = confidence interval. Means are estimated marginal means of the difference scores in the model in RQ2. Difference scores are the differences of *z*-transformed LIWC scores "translator minus speaker", which can be seen as effect sizes corresponding to Cohen's *d*. Difference scores < 0 mean that the according category was used less often by the translator than by the original speaker.

[a] Cohen's *d* here refers to the effect size of the differences between the mean difference scores of same gender and opposite gender dyads. Pooled standard deviation with weights for the sizes of the two groups were used to compute Cohen's *d*.

LIWC variables investigated here were determined based on the gender differences in function word categories empirically found in RQ1.

Discussion

Building upon a conceptual model to distinguish between language content versus style, the current study used gendered language style as an example to investigate psychological adaptation during translation. The results did not support our assumption that translators implicitly project their own gendered, stylistic features onto translations. In other words, the gender differences observed in TED speakers' language style were in fact not lost in translation. Essentially, the profile of gender-sensitive word categories in translations largely matched the genders of the original speakers, suggesting that assimilation of gendered language styles happens during translation. Put another way, beyond the mere translation of *what* was said, translators managed to capture the more subtle characteristics of *how* something was said: The message's psychological essence.

As the first study to investigate translations from a psychological perspective, the results suggest that translators may overcome the temptation to implicitly project their own automatic function word use pattern and assimilate to patterns that are in contrast to their own. This speaks for a more dynamic view on gendered language style as construed within the social situation (Thomson et al., 2001). In a similar way as gender differences in emotional expression depend on socialization (Brody, 2000; Brody & Hall, 2008), individuals might adapt their language style contrary to their own gendered inclinations.

Although our results generally point to assimilation of gendered language signatures during translation, subtle signs of projection were also observed, and we note that conjunctions and articles might form an exceptional case. Not only were they among the best discriminating word categories between male and female speakers, male and female translators seemed to level out their low or high use, particularly in same-gender dyads. Since articles and conjunctions are part of an analytical thinking dimension in language (Pennebaker, Chung, Frazee, Lavergne, & Beaver, 2014), examining the special role that dynamic versus analytical language styles might play during translation would be an intriguing question for future research.

Findings from the present study add to the well-established literature on gendered language styles in several significant ways. First of all, the gender differences identified for TED *speakers* are in line with previous work suggesting that function words – especially personal pronouns, articles, conjunctions, and numbers – are robust discriminators between men and women; and that language typically used by females is characterized by higher emotional expressiveness, personal and social relatedness, whereas males' language style is more instrumental or concept-oriented (Argamon et al., 2003; Newman et al., 2008). Although all these differences were rather small effects ($\eta^2_P \leq .034$), it seems remarkable that these gender differences largely generalize onto the highly prepared and standardized speech context of TED Talks.

Previously, it has been suggested that gender differences in language style are most pronounced in contexts with few constraints, i.e., spontaneous, spoken language (Newman et al., 2008). People's inclination to use language in ways conforming to their social group, may be driven by situational cues, e.g., the salience of gender. Despite TED's homogeneous and comparable format across talks, the underrepresentation of female speakers might possibly activate gender schemes and trigger speakers' use of gender-conform language styles in this context. Translations on the other hand, may represent a situation in which own gender is not as salient, thus possibly facilitating assimilation to gendered signatures that contrast with the own gender.

The results of the present study should be understood in the context of its limitations. First, female TED speakers (32.7 %), as well as male TED translators (44.1 %) were underrepresented in our sample, which led to an underrepresentation of female speaker / male translator dyads ($N = 55$, 10.1%).

Secondly, TED translations represent well-prepared, written translations and translators were encouraged to try to match the talks' original tone. We cannot exclude the possibility that this triggered translators' conscious efforts to monitor stylistic aspects and that less accommodation (and, conversely, more projection) happens during more spontaneous, time-constrained forms of

translations. This opens the door for further experimental research, for example comparing simultaneous translations with offline translations that vary in task instruction, time, and cognitive demand.

Further research is required to shed light on possible cultural implications when studying translations. While in the current study, the cultural context of English versus German language would not suggest differences in the expression of gender roles, it might possibly activate different self-schemes of personality (Ramírez-Esparza, Gosling, Benet-Martínez, Potter, & Pennebaker, 2006; Rodríguez-Arauz, Ramírez-Esparza, Pérez-Brena, & Boyd, 2017). Future research should examine whether individuals assimilate to psychological styles that are in contrast with their own personality, and whether certain languages facilitate assimilation to e.g. "extraverted" language styles. Another intriguing avenue will be to explore whether language-specific, emotional display rules (Ekman, Sorenson, & Friesen, 1969) may affect translations, for instance whether translation to more "emotional" languages, for example Italian, would lead to more projection in emotional tone. More generally speaking, our findings should be replicated in other contexts beyond TED Talks before being generalized prematurely.

Conclusion

The present study provided first evidence that psychological adaptation occurs during translation. Understanding the social psychological dynamics involved in translations is an issue of immense importance in multi-lingual contexts, but one that has remained largely unexplored. Results of the present study yield promising insights into how translators manage to step into the shoes of another person and capture subtler features of the intended meaning, opening the door for more research to be conducted in this area.

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Supplemental Material A

Assumption check

Check for non-independencies in the dataset.

Prior to any analyses, we tested the presence of non-independencies in the dataset, stemming from translators who provided more than one translation. As outlined in the pre-registration, we did so in a sample of N =1,338 talks (N = 1,338 speakers, N = 234 translators); i.e., the subset of talks in which all translators provided more than one translation. The number of translations provided by any translator ranged from 2 to 88.

The results (see Table S1) indicated that for at least four word categories, the clustering of the data could not be ignored as the design effect was > 2, which is an indicator for non-independency (Muthen & Satorra, 1995). Among these categories were function word categories, e.g. pronouns and conjunctions, that were central for our main research question. Based on the observed non-independence for translators with more than one translation, we opted for a conservative approach and restricted the sample to the number of unique translators (N = 544, "Translated Subsample") for the analyses in which the translations were in focus.

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Table S1. Test for non-independencies in dataset where translators provided multiple translations (*N* =1,338 talks).

LIWC variable	Between-cluster variance	Within-cluster variance	ICC	Average cluster size	Design Effect
Words ≥ six letters	1.01	12.27	0.08	25.80	2.89[a]
Numbers	0.04	0.82	0.04	1.74	1.03
Total function words	1.39	7.74	0.15	53.80	9.03[a]
Pronouns	0.74	7.25	0.09	17.73	2.54[a]
Personal pronouns	0.65	6.18	0.10	9.95	1.86
1st person singular (I, …)	0.29	5.02	0.05	2.96	1.11
3rd person singular (she, he, …)	0.09	1.43	0.06	2.97	1.12
3rd person plural (they, …)	0.07	0.87	0.08	1.87	1.07
Articles	0.25	2.77	0.08	10.84	1.81
Prepositions	0.12	1.91	0.06	9.95	1.54
Adverbs	0.04	0.67	0.06	3.98	1.17
Conjunctions	0.19	1.94	0.09	12.41	2.03[a]
Quantifiers	0.00	0.53	0.01	2.99	1.01
Positive Emotions	0.02	0.89	0.02	2.94	1.04
Anger	0.00	0.10	0.02	0.24	0.99
Anxiety	0.00	0.05	0.03	0.19	0.98
Swear words	0.00	0.01	0.00	0.03	1.00
Perception	0.02	0.86	0.02	2.18	1.02
Cognitive Processes	0.04	5.56	0.01	15.51	1.11
Insight	0.00	0.67	0.01	2.53	1.01
Causation	0.01	0.50	0.02	2.54	1.04
Discrepancy	0.02	0.37	0.04	2.07	1.04
Tentative	0.00	0.76	0.00	3.04	1.01
Certainty	0.03	0.67	0.04	2.96	1.08
Differentiation	0.06	0.90	0.06	4.17	1.19
Social words	0.39	7.12	0.05	13.35	1.65
Affiliation	0.02	1.87	0.01	3.23	1.03
Achievement	0.02	0.68	0.03	3.47	1.08
Power	0.02	0.44	0.04	1.48	1.02
Present focus	0.18	1.91	0.09	5.19	1.37
Home	0.00	0.06	0.03	0.22	0.98
Informal	0.04	0.45	0.09	1.48	1.04
Nonfluency	0.00	0.01	0.04	0.03	0.96
Fillers	0.00	0.00	0.10	0.03	0.91

Note. ICC = Intraclass correlation coefficient = Between-cluster variance / (between-cluster variance + within-cluster variance)

Design effect = 1 + (average_cluster_size – 1) ×ICC

[a]Design effect > 2, indicating that the clustering of the data could not be ignored (Muthen & Satorra, 1995).

Supplemental Material B

Power considerations

Our *N* was defined by the population of English TED Talks (see figure 2; "Full Sample") and number of TED Talks that had been translated into German in the subpopulation "Translated Subsample" (see figure 2) in March 2018. Sensitivity analyses revealed that with a power of 80%, the *N*'s of the "Full Sample" and "Translated Subsample" allow for the detection of traditionally called "small" to "very small" effects. For our reported analyses, in the "Full Sample" effect sizes f^2 of 0.016 (alpha level of 5%) and 0.028 (alpha level of 0.1%) could be detected in RQ1 (speakers' gender differences). In the "Translated Subsample", detectable effects ranged from f^2 of 0.050 (alpha level of 5%) to 0.087 (alpha level of 0.1%). The literature suggests small effects for gender differences in language use (Newman et al., 2008) and our candidate word categories were based on those with an effect size of $|d| \geq .15$ in the Newman et al. (2008) sample (see Table 2), we thus believe that our sample sizes were appropriate for the reported analyses. As a form of cross-validation, we replicated the analyses of the "Full Sample" (RQ1, speakers) in the "Translated Subsample". For RQ2, analyses had the sensitivity to detect effects of f^2 of 0.013 (alpha level of 5%) and 0.023 (alpha level of 0.1%).

Assumption check for the MANOVAs reported

RQ1.

Prior to running the models for speakers and for translators, we tested whether the assumptions for the MANOVA approach were met. For both models for the speakers and for the translators, the box's tests of equality of covariance matrices were significant ($p < .001$), therefore, homogeneity of variance-covariance matrices was not given in our data. However, the MANOVA approach is robust against violations of homogeneity covariance matrices if the group sizes are larger than 30 (Allen & Bennet, 2007) , which was the case in our sample.

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Furthermore, in the first MANOVA for the speakers, homogeneity of error variances could not be assumed for several of our dependent variables (10 out of 34), as indicated by the significant Levene's tests for these variables (see Table S2). Also, in the second MANOVA that we conducted for the translators in the "Translated Subsample", the requirement of homogeneity of error variances was not met either for several of our dependent variables (5 out of 34), as indicated by the significant Levene's tests (see Table S2). For this reason, we log-transformed all dependent variables in our models. With this procedure, we could reduce the degree of heteroscedasticity in our data. After log-transformation, in the first model (speakers) 8 out of 34 DVs showed significant Levene's test result, which were "personal pronouns", "shehe", "they", "anger", "anxiety", "swear", "social" and "home". In the second model (translators) 4 out of 34 DVs showed significant Levene's test result after log-transformation). The affected variables were "six letter > words", "number", cause", and "nonfluency". Since the heteroscedasticity was not fully avoidable, we relied on a more conservative level of significance (0.1%) for the interpretation of the subsequent univariate test results, and particularly for the identification of gender-sensitive function word categories to be used in RQ2.

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Table S2. RQ1, speakers and translators: Levene's test results before and after log-transformation of the dependent variables (DVs) for the reported models.

	Speakers ("Full Sample", $N = 1{,}647$)				Translators («Translated Subsample», $N = 544$)			
	Non-log-transformed DVs		Log-transformed[a] DVs		Non-logtransformed DVs		Log-transformed[a] DVs	
LIWC variable	$F_{(1, 1,645)}$	p	$F_{(1, 1,645)}$	p	$F_{(1, 542)}$	p	$F_{(1, 542)}$	p
Words ≥ six letters	0.61	.436	0.16	.688	3.14	.077	4.15	.042*
Numbers	14.20	<.001***	2.51	.113	9.56	.002**	7.52	.006**
Total function words	1.06	.302	1.22	.270	0.00	.959	.00	.987
Pronouns	2.52	.113	1.70	.193	0.03	.864	.24	.621
Personal pronouns	21.19	<.001***	6.26	.012*	0.51	.477	.80	.371
1st person singular (I, …)	21.60	<.001***	3.59	.058	3.67	.056	.43	.514
3rd person singular (she, he, …)	17.19	<.001***	10.51	.001**	1.33	.250	2.19	.139
3rd person plural (they, …)	12.83	<.001***	5.04	.025*	0.01	.919	.03	.855
Articles	0.02	.900	3.11	.078	0.77	.380	.73	.393
Prepositions	1.35	.245	0.83	.362	1.25	.264	.31	.577
Adverbs	2.66	.103	0.29	.593	1.22	.271	1.47	.227
Conjunctions	1.10	.295	0.02	.892	0.00	.967	.05	.823
Quantifiers	1.36	.244	0.05	.821	0.30	.586	.08	.776
Positive Emotions	3.34	.068	0.65	.419	0.00	.960	.17	.678
Anger	6.89	.009**	8.85	.003**	1.35	.245	.72	.398
Anxiety	17.27	<.001***	18.61	<.001***	5.46	.020*	3.84	.050
Swear words	5.06	.025*	6.02	.014*	0.46	.498	.30	.582
Perception	0.17	.676	0.92	.339	0.00	.977	.09	.765
Cognitive Processes	0.08	.775	0.12	.728	3.42	.065	2.88	.090
Insight	0.19	.664	0.02	.895	0.09	.768	.01	.943
Causation	0.02	.892	0.00	.950	4.44	.036*	4.39	.037*
Discrepancy	0.64	.425	0.81	.369	0.00	.949	.11	.740
Tentative	0.52	.473	0.01	.941	0.21	.650	.14	.711
Certainty	3.46	.063	3.18	.075	1.25	.263	.91	.339
Differentiation	0.21	.647	0.06	.812	0.15	.696	.33	.563
Social words	25.94	<.001***	7.37	.007**	0.07	.793	.02	.882
Affiliation	0.88	.349	1.23	.268	0.28	.598	.17	.684
Achievement	0.02	.884	0.03	.857	0.06	.809	.04	.849
Power	0.82	.367	0.38	.538	0.11	.740	.00	.944
Present focus	0.01	.938	1.58	.209	0.37	.542	.01	.932
Home	10.50	.001**	10.30	.001**	2.17	.141	2.10	.148
Informal	2.06	.151	0.42	.517	4.36	.037*	1.30	.254
Nonfluency	0.01	.931	0.06	.813	12.76	<.001***	12.54	<.001***
Fillers	2.13	.145	1.94	.164	1.88	.171	2.09	.149

* $p < .05$, ** $p < .01$, ** $p < .001$

Note. [a]LIWC scores were log-transformed using the following formula: LN(x+1). A constant was added, sicne there were cases with LIWC scores = 0.

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RQ2.

The box's tests of equality of covariance matrices was significant ($p < .001$) for the model reported in RQ2, and therefore, homogeneity of variance-covariance matrices was not given in our data which could be neglected due our sample size > 30 (Allen & Bennet, 2007). Furthermore, homogeneity of error variances could not be assumed for one ("shehe") of the seven dependent variables in this research question, as indicated by the significant Levene's tests for this variable (see Table S3). In an attempt to reduce heteroscedasticity, we performed a log-transformation on the dependent variables. This, however, did not result in a decrease, as indicated by the Levene's test, in which two out of the seven log-transformed difference scores showed a significant test result. We therefore computed our model using the original difference scores described above without any transformation.

Table S3. RQ2: Results of Levene's test for the dependent variables in the models computed.

LIWC variables (Difference scores)	Non-logtransformed DVs		Logtransformed[a] DVs	
	$F_{(3, 540)}$	*p*	$F_{(3, 540)}$	*p*
Numbers	0.48	.694	0.79	.502
Personal pronouns	1.20	.308	1.15	.330
1st person singular (I, …)	2.13	.096	2.32	.074
3rd person singular (she, he, …)	4.32	.005**	5.32	.001**
3rd person plural (they, …)	2.60	.052	1.88	.132
Articles	0.94	.423	0.97	.405
Conjunctions	2.10	.099	3.92	.009**

* $p < .05$, ** $p < .01$, ** $p < .001$

Note. All LIWC scores represent difference scores of z-transformed LIWC scores "translator minus speaker".

[a]LIWC scores were log-transformed using the following formula: LN(x+4).

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Supplemental Material C

Research Question 1

Background: Candidate LIWC – categories of gender differences in language use.

Based on the literature on gender and language, female speakers were for example expected to use more words referring to affective (e.g. "happy", "sad"), social processes (e.g. "family", "friends"), and cognitive processes ("but", "except", "realize"). The latter one with its various subcategories includes indicators for elaboration (differentiation words: e.g. "but"; "except"), and for assertiveness in language (certainty words: e.g. "always", "never"; discrepancy words: e.g. "should", "would"). Filler words and non-fluency markers such as "ehm" further serve as indicators of assertive language.

Female speakers were further expected to use more pronouns, meaning that they refer more to other people (e.g. "she", "he", "they", ...), but also more to themselves (e.g. "I"). Higher pronoun use has been linked with more immediate (Pennebaker & King, 1999), contextual (Heylighen & Dewaele, 2002) and dynamic language (Pennebaker, Chung, Frazee, Lavergne, & Beaver, 2014). More specifically, first person singular pronoun use has been found to be associated with lower status (Kacewicz, Pennebaker, Davis, Jeon, & Graesser, 2014) and distress proneness (Tackman et al., 2018). Similarly, females were expected to use more conjunctions; words that link sentences like “and, but, however”. Conjunctions, together with pronouns are seen as a signal of a more dynamic, narrative language style (Pennebaker et al., 2014) not linked to formality (Heylighen & Dewaele, 2002).

In contrast, we expected male speakers to show a more categorical and complex language style (as opposed to a dynamic, narrative language style), as indicated by a higher use of articles, prepositions and long words. The more frequent use of articles paired with a more frequent use of numbers can also be considered as a more object-, fact-oriented, or instrumental language style.

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Supplemental Material D

Research question 1, Additional Analysis: Replication of speaker's gender differences in subsample

The same MANOVA as in the reported analysis for RQ1 was conducted to examine gender differences of *speaker*'s language use in the smaller subsample ("Translated Subsample", $N = 544$ talks). There was a statistically significant difference in language use based on speakers' gender, $F(34, 508) = 3.58$, $p < .001$; Pillai's Trace = 0.193, $\eta^2_P = .193$. The majority of the univariate gender effects found in the large sample generalized onto the effects in the smaller sample. Six categories that showed significant gender differences ($p < .05$) in the large sample were not significant in the smaller sample ("adverbs", "anger", "perception", "differentiation", "focuspresent", and "informal"). In addition, in the smaller sample, a marginally significant gender difference for "total function words" was found ($p = .049$, $F(1, 541) = 3.89$, $\eta^2_P = .007$), that was not present in the larger sample. The results of the univariate tests are reported in Table S4.

In sum, we found gender differences in the use of several LIWC categories for TED speakers. Female TED speakers' language style was characterized by a higher use of personal pronouns and conjunctions, supporting the assumption of a more personal and dynamic language style. On the other hand, male TED speakers in our sample used more numbers, and articles, indicating a more impersonal, and categorical language style. We also found gender differences in content related categories (in the order of the effect size): females used more social, anxiety, affiliation, and home related words, and men more words referring to an informal language style.

Contrary to our expectations from the literature, we did not find any significant gender differences for "prepositions" or "swear" words, and gender differences for "cognitive processes" were only observable for the subcategories "insight" and "differentiation", and disappeared when

relying on a more conservative alpha level (0.1% due to the presence of heteroscedasticity in our data).

Regarding assertiveness in language, our results were in the other direction than expected, as "nonfluency markers" and "informal language" were used more by male TED speakers. Considering that female TED speakers are an underrepresented group in the TED conference (32.7% in our sample), the results suggest that female speakers attempt to achieve more respectability and authority by avoiding informal and non-fluent language. The female preference for the use of more words referring to "anxiety" further suggests that female speakers opened up more personally to the audience than male speakers, and that this was particularly the case for negative experiences.

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Table S4. Replication of TED speakers' gender differences in language use in the smaller sample ("Translated Subsample", $N = 544$).

LIWC variable	Speaker *M* [95% CI]		F (1, 541)	*p*	η^2_P [90% CI]
	Female ($N = 168$)	Male ($N = 376$)			
Words ≥ six letters	18.06 [17.57; 18.55]	17.83 [17.53; 18.13]	0.17	.683	.0003 [.000, .007]
Numbers	1.78 [1.67; 1.89]	2.07 [1.98; 2.16]	10.51	.001**	.019 [.005, .042]
Total function words	55.74 [55.22; 56.25]	55.61 [55.28; 55.93]	3.89	.049*	.007 [.00002, .024]
Pronouns	16.33 [15.85; 16.82]	15.69 [15.42; 15.96]	8.95	.003**	.016 [.003, .038]
Personal pronouns	9.31 [8.87; 9.75]	8.20 [7.97; 8.42]	17.88	<.001***	.032 [.012, .060]
1st person singular (I, …)	3.31 [2.93; 3.69]	2.38 [2.20; 2.57]	17.58	<.001***	.031 [.012, .059]
3rd person singular (she, he, …)	0.91 [0.74; 1.07]	0.63 [0.55; 0.70]	12.36	<.001***	.022 [.006, .047]
3rd person plural (they, …)	1.30 [1.19; 1.42]	1.12 [1.06; 1.19]	7.17	.008**	.013 [.002, .033]
Articles	7.05 [6.85; 7.25]	7.75 [7.62; 7.88]	32.70	<.001***	.057 [.029, .091]
Prepositions	13.59 [13.37; 13.82]	13.58 [13.44; 13.72]	0.28	.594	.001 [.000, .008]
Adverbs	5.72 [5.54; 5.90]	5.92 [5.78; 6.05]	0.18	.671	.0003 [.000, .007]
Conjunctions	7.56 [7.38; 7.75]	7.19 [7.06; 7.32]	13.75	<.001***	.025 [.008, .050]
Quantifiers	2.28 [2.18; 2.38]	2.44 [2.37; 2.51]	5.92	.015*	.011 [.001, .030]
Positive Emotions	2.77 [2.63; 2.92]	2.63 [2.53; 2.73]	2.41	.122	.004 [.000, .018]
Anger	0.35 [0.29; 0.41]	0.32 [0.28; 0.37]	1.07	.300	.002 [.000, .013]
Anxiety	0.33 [0.26; 0.40]	0.22 [0.19; 0.25]	15.18	<.001***	.027 [.009, .054]
Swear words	0.03 [0.02; 0.04]	0.04 [0.03; 0.04]	0.28	.599	.001 [.000, .008]
Perception	2.43 [2.27; 2.59]	2.54 [2.44; 2.65]	2.00	.158	.004 [.000, .017]
Cognitive Processes	11.73 [11.43; 12.04]	11.68 [11.46; 11.90]	0.95	.329	.002 [.000, .012]
Insight	2.62 [2.50; 2.74]	2.48 [2.39; 2.57]	5.05	.025*	.009 [.001, .027]
Causation	2.09 [1.98; 2.19]	2.00 [1.93; 2.06]	1.14	.286	.002 [.000, .013]
Discrepancy	1.46 [1.39; 1.54]	1.52 [1.47; 1.58]	0.27	.600	.001 [.000, .008]
Tentative	2.43 [2.31; 2.54]	2.61 [2.53; 2.69]	2.85	.092	.005 [.000, .020]
Certainty	1.37 [1.30; 1.44]	1.37 [1.33; 1.42]	0.10	.751	.0002 [.000, .006]
Differentiation	3.13 [3.02; 3.25]	3.15 [3.07; 3.23]	0.32	.570	.001 [.000, .009]
Social words	11.02 [10.54; 11.51]	9.81 [9.54; 10.07]	21.46	<.001***	.038 [.016, .068]
Affiliation	3.29 [3.09; 3.50]	3.01 [2.88; 3.14]	4.49	.034*	.008 [.0003, .025]
Achievement	1.61 [1.51; 1.70]	1.50 [1.43; 1.56]	2.89	.090	.005 [.000, .020]
Power	2.41 [2.25; 2.57]	2.43 [2.32; 2.53]	0.29	.589	.001 [.000, .008]
Present focus	10.91 [10.55; 11.27]	11.19 [10.95; 11.44]	0.01	.908	.00002 [.000, .001]
Home	0.33 [0.29; 0.37]	0.26 [0.23; 0.28]	7.76	.006**	.014 [.002, .035]
Informal	0.39 [0.35; 0.43]	0.46 [0.42; 0.50]	1.95	.163	.004 [.000, .017]
Nonfluency	0.17 [0.15; 0.19]	0.20 [0.19; 0.22]	2.99	.084	.005 [.000, .021]
Fillers	0.01 [0.01; 0.01]	0.01 [0.01; 0.01]	0.06	.808	.0001 [.000, .005]

* $p < .05$, ** $p < .01$, ** $p < .001$

Note. Means refer to percentages of the total words used. All LIWC scores were log-transformed prior to analysis. Bounds of CI = .000 correspond to values <.0001.

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Table S5. RQ1, speakers smaller subsample ("Translated Subsample"): Levene's test results before and after log-transformation of the dependent variables (DVs)

	Speakers ("Translated Subsample", $N = 544$)			
	Non-logtransformed DVs		Log-transformed[a] DVs	
LIWC variable	$F_{(1, 542)}$	p	$F_{(1, 542)}$	p
Words ≥ six letters	2.00	.158	1.60	.207
Numbers	7.25	.007**	1.78	.183
Total function words	1.39	.240	1.06	.305
Pronouns	7.63	.006**	4.80	.029*
Personal pronouns	20.89	<.001***	10.01	.002**
1st person singular (I, …)	25.63	<.001***	10.13	.002**
3rd person singular (she, he, …)	19.46	<.001***	13.03	<.001***
3rd person plural (they, …)	3.14	.077	1.51	.220
Articles	0.02	.899	1.31	.253
Prepositions	1.04	.309	0.92	.339
Adverbs	3.43	.065	2.06	.151
Conjunctions	0.00	.953	0.48	.491
Quantifiers	0.04	.846	0.65	.421
Positive Emotions	0.31	.577	0.02	.875
Anger	0.05	.824	0.02	.899
Anxiety	5.08	.025*	5.73	.017*
Swear words	2.66	.103	2.11	.147
Perception	0.10	.751	1.49	.224
Cognitive Processes	1.83	.176	1.93	.165
Insight	0.31	.576	0.63	.428
Causation	0.32	.570	0.02	.890
Discrepancy	0.31	.575	0.00	.956
Tentative	0.08	.780	0.37	.541
Certainty	1.61	.206	2.54	.112
Differentiation	1.04	.308	1.47	.226
Social words	9.50	.002**	2.29	.131
Affiliation	1.69	.194	0.01	.913
Achievement	0.06	.812	0.42	.516
Power	0.05	.830	0.09	.763
Present focus	0.50	.480	0.16	.687
Home	8.76	.003**	7.65	.006**
Informal	1.45	.230	0.11	.743
Nonfluency	5.01	.026*	3.48	.062
Fillers	0.01	.911	0.00	.959

* $p < .05$, ** $p < .01$, ** $p < .001$

Note. [a]LIWC scores were log-transformed using the following formula: LN(x+1).

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Supplemental Material E

Additional Analysis: *Speaker's* gender main effect on *translated* language use.

Table S6. Language use in translations by original TED *speaker's* gender

LIWC variable	Speaker *M* [95% CI]		$F_{(1, 540)}$	*p*	η^2_P [90% CI]
	Female (*N* = 168)	Male (*N* = 376)			
Words ≥ six letters	26.28 [25.70; 26.86]	25.98 [25.62; 26.34]	0.10	.748	.0002 [.000; .006]
Numbers	1.54 [1.43; 1.64]	1.84 [1.76; 1.93]	14.84	<.001***	.027 [.009; .053]
Total function words	53.88 [53.43; 54.33]	53.47 [53.18; 53.76]	9.66	.002**	.018 [.004; .040]
Pronouns	17.74 [17.27; 18.21]	17.22 [16.95; 17.50]	7.28	.007**	.013 [.002; .034]
Personal pronouns	10.65 [10.21; 11.09]	9.35 [9.10; 9.59]	26.64	<.001***	.047 [.022; .079]
1st person singular (I, …)	3.49 [3.09; 3.89]	2.52 [2.32; 2.73]	15.02	<.001***	.027 [.009; .053]
3rd person singular (she, he, …)	3.14 [2.95; 3.32]	2.82 [2.71; 2.94]	10.92	.001**	.020 [.005; .043]
3rd person plural (they, …)	2.04 [1.88; 2.20]	1.74 [1.66; 1.83]	12.22	.001**	.022 [.006; .047]
Articles	10.44 [10.17; 10.70]	11.19 [11.03; 11.35]	20.47	<.001***	.037 [.015; .066]
Prepositions	10.29 [10.08; 10.51]	9.92 [9.79; 10.06]	1.73	.189	.003 [.000; .016]
Adverbs	4.01 [3.89; 4.12]	3.93 [3.85; 4.02]	1.12	.291	.002 [.000; .013]
Conjunctions	12.36 [12.15; 12.57]	12.30 [12.17; 12.44]	2.71	.100	.005 [.000; .020]
Quantifiers	2.86 [2.75; 2.96]	3.02 [2.95; 3.09]	4.38	.037*	.008 [.0003; .025]
Positive Emotions	2.93 [2.78; 3.07]	2.90 [2.81; 2.99]	0.08	.783	.0001 [.000; .006]
Anger	0.26 [0.21; 0.30]	0.25 [0.21; 0.28]	0.24	.627	.0004 [.000; .008]
Anxiety	0.25 [0.20; 0.31]	0.17 [0.15; 0.20]	11.83	.001**	.021 [.006; .046]
Swear words	0.02 [0.01; 0.03]	0.03 [0.02; 0.04]	1.86	.173	.003 [.000; .016]
Perception	2.00 [1.88; 2.12]	2.08 [2.00; 2.17]	1.54	.216	.003 [.000; .015]
Cognitive Processes	15.62 [15.26; 15.98]	15.58 [15.35; 15.82]	0.26	.611	.0005 [.000; .008]
Insight	2.65 [2.53; 2.76]	2.49 [2.41; 2.57]	4.71	.030*	.009 [.0004; .026]
Causation	2.49 [2.38; 2.60]	2.55 [2.49; 2.61]	0.15	.695	.0003 [.000; .007]
Discrepancy	2.08 [2.00; 2.17]	2.08 [2.02; 2.13]	0.62	.431	.001 [.000; .011]
Tentative	3.07 [2.93; 3.20]	3.06 [2.98; 3.14]	0.54	.463	.001 [.000; .010]
Certainty	2.98 [2.84; 3.11]	2.94 [2.86; 3.02]	0.83	.363	.002 [.000; .012]
Differentiation	4.33 [4.19; 4.46]	4.21 [4.12; 4.29]	3.25	.072	.006 [.000; .021]
Social words	13.81 [13.37; 14.25]	12.90 [12.65; 13.16]	17.47	<.001***	.031 [.012; .059]
Affiliation	3.37 [3.17; 3.57]	3.17 [3.04; 3.30]	3.03	.082	.006 [.000; .021]
Achievement	3.52 [3.41; 3.63]	3.47 [3.39; 3.55]	0.39	.531	.001 [.000; .009]
Power	1.56 [1.45; 1.68]	1.56 [1.49; 1.63]	0.00	.948	.00001 [.000; .000]
Present focus	4.83 [4.61; 5.04]	5.27 [5.13; 5.41]	3.29	.070	.006 [.000; .022]
Home	0.26 [0.22; 0.30]	0.21 [0.19; 0.23]	4.53	.034*	.008 [.0003; .026]
Informal	1.26 [1.18; 1.35]	1.52 [1.44; 1.59]	8.13	.005**	.015 [.003; .036]
Nonfluency	0.03 [0.02; 0.03]	0.03 [0.02; 0.04]	0.01	.914	.00002 [.000; .001]
Fillers	0.03 [0.02; 0.03]	0.03 [0.02; 0.04]	0.05	.828	.0001 [.000; .004]

* $p < .05$, ** $p < .01$, ** $p < .001$

Note. Means refer to percentages of the total words used. All LIWC scores were log-transformed prior to analysis. Lower bounds of CI = .000 correspond to values <.0001.

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Table S7. Language use in translations by original TED *speaker's* gender: Levene's test results before and after log-transformation of the dependent variables (DVs)

LIWC variable	Non-logtransformed DVs		Log-transformed[a] DVs	
	$F_{(3, 540)}$	*p*	$F_{(3, 540)}$	*p*
Words ≥ six letters	1.77	.151	1.97	.118
Numbers	4.55	.004**	2.94	.033*
Total function words	.08	.972	.03	.993
Pronouns	1.69	.168	.98	.401
Personal pronouns	5.42	.001**	2.52	.057
1st person singular (I, …)	10.24	<.001***	5.07	.002**
3rd person singular (she, he, …)	2.65	.048*	2.31	.075
3rd person plural (they, …)	3.78	.010*	2.90	.034*
Articles	.74	.526	1.37	.251
Prepositions	.87	.457	.64	.589
Adverbs	1.16	.326	1.43	.233
Conjunctions	.06	.983	.10	.962
Quantifiers	.43	.730	.93	.425
Positive Emotions	.04	.989	.05	.986
Anger	.50	.683	.30	.828
Anxiety	3.44	.017*	2.91	.034*
Swear words	1.07	.363	1.19	.311
Perception	.02	.995	.25	.861
Cognitive Processes	1.23	.297	1.10	.348
Insight	.08	.971	.08	.971
Causation	3.44	.017*	3.12	.026*
Discrepancy	.23	.876	.19	.906
Tentative	.55	.646	.51	.679
Certainty	.89	.446	.87	.459
Differentiation	.67	.568	.56	.645
Social words	2.46	.062	.97	.409
Affiliation	.66	.579	.43	.733
Achievement	.50	.681	1.11	.346
Power	.41	.746	.37	.771
Present focus	.43	.729	.78	.503
Home	3.67	.012*	2.96	.032*
Informal	2.48	.060	.88	.452
Nonfluency	4.46	.004**	4.34	.005**
Fillers	1.39	.244	1.51	.211

* $p < .05$, ** $p < .01$, ** $p < .001$

Note. [a]LIWC scores were log-transformed using the following formula: LN(x+1).

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Supplemental Material F

Research question 2: Univariate results for the main analysis reported in manuscript.

Table S8. Results of the univariate analyses for research question 2, for the main effects of "dyad type" (same versus opposite gender) , "translator's gender", and the dyad type × translator's gender interaction effect: Differences of z-transformed LIWC scores "translator minus speaker".

	Dyad type			Translator's gender			dyad type × translator's gender		
LIWC variables (Difference scores)	$F_{(1, 539)}$	*p*	η^2_P [90% CI]	$F_{(1, 539)}$	*p*	η^2_P [90% CI]	$F_{(1, 539)}$	*p*	η^2_P [90% CI]
Numbers	1.62	.204	.003 [.000, .015]	1.89	.170	.003 [.000, .017]	0.60	.437	.001 [.000, .011]
Personal pronouns	1.17	.280	.002 [.000, .014]	0.06	.807	.0001 [.000, .005]	0.99	.320	.002 [.000, .013]
1st person singular (I, …)	0.69	.405	.001 [.000, .011]	0.04	.852	.0001 [.000, .003]	1.57	.210	.003 [.000, .015]
3rd person singular (she, he, …)	1.21	.272	.002 [.000, .014]	0.39	.534	.001 [.000, .009]	0.57	.452	.001 [.000, .010]
3rd person plural (they, …)	0.51	.473	.001 [.000, .010]	0.10	.757	.0002 [.000, .006]	1.26	.262	.002 [.000, .014]
Articles	0.02	.879	.00004 [.000, .002]	0.03	.857	.0001 [.000, .003]	4.00	.046*	.007 [.000, .024]
Conjunctions	.67	.412	.001 [.000, .011]	5.26	.022*	.010 [.001, .028]	5.36	.021*	.010 [.001, .028]

* $p < .05$, ** $p < .01$, ** $p < .001$

Note. The dependent variables were difference scores of z-transformed LIWC scores "translator minus speaker".
The LIWC variables investigated here were determined based on the gender differences in function word categories that were empirically found in RQ 1.

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Supplemental Material G

Research question 2: Descriptives by the four different speaker/translator dyad types.

Table S9. Descriptives for the four different speaker/translator dyad compositions

		M [95% CI]			
LIWC variables		Female speaker / female translator	Male speaker/ male translator	Male speaker/ female translator	Female speaker / male translator
N		113	185	191	55
Total word count	Speaker	2150.80 [1993.90 ,2307.69]	2611.41 [2467.82, 2754.99]	2676.01 [2524.95, 2827.06]	2183.31 [1931.00, 2435.62]
	Translator	1956.27 [1809.07, 2103.47]	2435.83 [2300.14, 2571.52]	2416.75 [2276.95, 2556.55]	2017.80 [1778.61 , 2256.99]
Numbers	Speaker	-0.23 [-0.38, -0.07][-0.36, -0.06]	0.17 [0.01, 0.33]	0.04 [-0.09, 0.18]	-0.26 [-0.50, -0.03]
	Translator	-0.24 [-0.39, -0.10]	0.13 [-0.04 , 0.29]	0.10 [-0.03, 0.24]	-0.28 [-0.53, -0.04]
Personal pronouns	Speaker	0.35 [0.15, 0.55]	-0.09 [-0.22 ,0.04]	-0.18 [-0.31, -0.05]	0.22 [-0.14, 0.57]
	Translator	0.40 [0.21, 0.59]	-0.09 [-0.23 , 0.04]	-0.21 [-0.34, -0.08]	0.23 [-0.11, 0.56]
1st person singular (I, …)	Speaker	0.36 [0.15, 0.58][10, 0.51]	-0.21 [-0.32, -0.09]	-0.07 [-0.21 , 0.06]	0.19 [-0.15, 0.54]
	Translator	0.35 [0.14, 0.56]	-0.21 [-0.32, -0.09]	-0.06 [-0.20, 0.07]	0.19 [-0.15, 0.53]
3rd person singular (she, he, …)	Speaker	0.22 [0.02, 0.43][0.05, 0.47]	-0.09 [-0.21, 0.03]	-0.10 [-0.23, 0.02]	0.21 [-0.19, 0.61]
	Translator	0.20 [0.01, 0.38][00.44]	-0.02 [-0.16, 0.13]	-0.15 [-0.28, -0.01]	0.16 [-0.17, 0.48]
3rd person plural (they, …)	Speaker	0.25 [0.04 ,0.45]	-0.08 [-0.22, 0.06]	-0.08 [-0.21 ,0.05]	0.06 [-0.24, 0.37]
	Translator	0.29 [0.10, 0.49]	-0.06 [-0.20, 0.08]	-0.14 [-0.26, -0.01]	0.08 [-0.25, 0.42]
Articles	Speaker	-0.44 [-0.61, -0.27]	0.07 [-0.06, 0.20]	0.26 [0.11, 0.40]	-0.23 [-0.53, 0.08]
	Translator	-0.39 [-0.57 ,-0.21]	0.04 [-0.09, 0.18]	0.23 [0.10, 0.37]	-0.15 [-0.47, 0.16]
Conjunctions	Speaker	0.16 [-0.03 , 0.35]	-0.20 [-0.34, -0.05]	0.01 [-0.13, 0.15][-0.12, 0.17]	0.29 [0.07, 0.52]
	Translator	-0.05 [-0.25 , 0.14]	0.01 [-0.14, 0.15]	-0.03 [-0.17 , 0.11]	0.20 [-0.07, 0.46]

Note. All means (except for total word count) represent z-transformed LIWC scores of the original speaker and of the translator.

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Research question 2, Additional Analysis: Language use in translations by the four different speaker/translator dyad types

In addition to the main analyses in RQ2 (where we relied on a binary "dyad type"factor, i.e. same-gender versus opposite-gender speaker/translator dyads), we computed another MANOVA as a more finegrained analyses with a "dyad compoisiton"-factor covering all four dyad types (i.e. the four different possible speaker/translator dyads: female-female, male-male, male-female, female, male). This approach was chosen to see whether any of the specific translator and speaker gender constellations explained the results, rather than the merely having the same or opposite gender.

Pairwise comparisons were conducted, using Bonferroni's correction for multiple testings. The multivariate effect of total word count was significant, F (7, 533) = 3.56, p = .001; Pillai's Trace = .045, η^2_P = .045. There was a statistically significant multivariate effect of "dyad composition" on the LIWC difference scores, F (21, 1,605) = 1.95, p = .006; Pillai's Trace = .074, η^2_P = .025. The results of the univariate analysis are presented in Table S10.

Out of the LIWC difference scores, the difference score for "conjunctions" showed significant differences based on the new "dyad composition" factor, F(3, 539) = 5.48, p = .001, η^2_P = .030, 90% CI = [.005, .020]. The pairwise comparisons showed that there were statistically significant differences in the difference score for "conjunctions" between dyad 1 (female /female) and dyad 2 (male/male), p = .001, mean difference = -.37, 95 % CI = [-.64, -.11]. This means that the use of conjunctions in the translations was more reduced in same-gender dyads when the translator was female, rather than male. Furthermore, there was a significant difference in the difference score for "conjunctions" between dyad 2 (male/male) and dyad 3 (male speaker / female translator), p = .021, mean difference = .25, 95 % CI = [.02, .47]. Conjunctions were therefore more reduced (relatively to the original transcript) in male/female dyads, compared to male/male dyads. The base rates in conjunction use in male speaker / male translator dyads was lowest, while it was highest in the dyads with female speakers and male translators. Together with the dyad type × translator's

gender interaction effect found in the main analyses, this hints towards gender-specific tendencies of translators to level out extreme values of conjunction and article use.

Table S10. Results of the additional analysis for research question 2 (with the "dyad composition" variable representing the four different dyad compositions): Differences of z-transformed LIWC scores "translator minus speaker".

		Dyad type categories						
LIWC variables (Difference scores)		Female speaker / female translator	Male speaker / male translator	Male speaker / female translator	Female speaker / male translator	$F_{(3, 539)}$	*p*	η^2_P [90% CI]
Numbers	*M* [95% CI]	-0.02 [-0.10, 0.06]	-0.04 [-0.10, 0.02]	0.06 [0.00, 0.12]	-0.02 [-0.13, 0.08]	2.28	.079	.013 [.000, .028]
Personal pronouns	*M* [95% CI]	0.04 [-0.02, 0.11]	0.00 [-0.05, 0.05]	-0.03 [-0.08, 0.02]	0.00 [-0.09, 0.09]	0.95	.416	.005 [.000, .015]
1st person singular (I, …)	*M* [95% CI]	-0.01 [-0.04, 0.01]	0.00 [-0.01, 0.02]	0.01 [-0.01, 0.02]	0.00 [-0.03, 0.03]	0.98	.401	.005 [.000, .015]
3rd person singular (she, he, …)	*M* [95% CI]	-0.02 [-0.16, 0.12]	0.08 [-0.03, 0.18]	-0.05 [-0.15, 0.06]	-0.06 [-0.25, 0.14]	1.06	.364	.006 [.000, .016]
3rd person plural (they, …)	*M* [95% CI]	0.08 [-0.07, 0.22]	-0.01 [-0.10, 0.13]	-0.07 [-0.18, 0.05]	0.04 [-0.17, 0.25]	0.85	.468	.005 [.000, .014]
Articles	*M* [95% CI]	0.07 [-0.04, 0.19]	-0.04 [-0.12, 0.05]	-0.04 [-0.12, 0.05]	0.09 [-0.07, 0.25]	1.38	.247	.008 [.000, .020]
Conjunctions	*M* [95% CI]	-0.18 [-0.34, -0.03]	0.19 [0.07, 0.31]	-0.06 [-0.18, 0.06]	-0.06 [-0.28, 0.15]	5.48	.001**	.030 [.008, .053]

* $p < .05$, ** $p < .01$, ** $p < .001$

Note. Means are estimated marginal means of the difference scores in the model in RQ2. Difference scores are the differences of z-transformed LIWC scores "translator minus speaker", which can be seen as effect sizes corresponding to Cohen's *d*.
Difference scores < 0 mean that the according category was used less often by the translator than by the original speaker.
The LIWC variables investigated here were determined based on the gender differences in function word categories that were empirically found in RQ 1.

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Supplemental Material H

Intercorrelations: Tables with bivariate Pearson correlations of the dependent variables of the MANOVAS conducted in Research Question 1 and 2.

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Research Question 1.

Table S11. Inter-correlations between the dependent variables of the model reported in RQ1, TED speaker's language use in "Full Sample" (N = 1,647).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
M	2.92	1.05	4.04	2.82	2.24	1.19	0.45	0.73	2.12	2.67	1.91	2.11	1.19	1.29	0.25	0.19	0.03	1.25	2.52	1.23	1.08	0.88	1.23	0.85	1.39	2.39	1.36	0.88	1.17	2.47	0.23	0.33	0.16	0.01
SD	0.17	0.29	0.06	0.18	0.26	0.52	0.42	0.31	0.16	0.10	0.19	0.15	0.20	0.27	0.24	0.19	0.06	0.30	0.18	0.24	0.22	0.22	0.24	0.20	0.21	0.26	0.34	0.25	0.27	0.22	0.20	0.22	0.13	0.04
1. Sixltr	-																																	
2. number	-.01	-																																
3. function	-.60**	-.33**	-																															
4. pronoun	-.65**	-.25**	.77**	-																														
5. ppron	-.57**	-.20**	.50**	.83**	-																													
6. I	-.40**	-.16**	.32**	.56**	.74**	-																												
7. shehe	-.22**	-.09**	.17**	.32**	.47**	.29**	-																											
8. they	.04	-.03	.00	.03	.11**	-.13**	.12**	-																										
9. article	.23**	.10**	-.18**	-.54**	-.57**	-.40**	-.19**	-.08**	-																									
10. prep	.32**	-.03	-.17**	-.44**	-.39**	-.24**	-.14**	.00	.29**	-																								
11. adverb	-.31**	-.14**	.53**	.32**	.06*	-.04	-.15**	-.11**	-.18**	-.25**	-																							
12. conj	-.22**	-.23**	.45**	.27**	.19**	.13**	.04	.07**	-.20**	-.24**	.40**	-																						
13. quant	.08**	.16**	-.11**	-.13**	-.23**	-.21**	-.29**	.00	-.07**	.05*	.20**	-.02	-																					
14. posemo	-.03	-.14**	-.04	.17**	.26**	.23**	.12**	.03	-.31**	-.28**	.00	.03	.07**	-																				
15. anger	.07**	-.07**	-.09**	-.03	.09**	.12**	.17**	.16**	-.05*	-.02	-.18**	-.09**	-.09**	.08**	-																			
16. anx	.09**	-.09**	-.07**	.03	.15**	.17**	.12**	.05*	-.22**	-.02	-.11**	-.03	-.03	.12**	.31**	-																		
17. swear	-.17**	-.05*	.05*	.17**	.17**	.15**	.08**	.01	-.13**	-.16**	.03	-.05*	-.02	.12**	.22**	.06*	-																	
18. percept	-.37**	-.16**	.20**	.32**	.31**	.30**	.14**	-.14**	-.06*	-.21**	.09**	.10**	-.18**	.09**	-.08**	-.04	.10**	-																
19. cogproc	-.01	-.27**	.32**	.30**	.12**	.03	-.08**	-.01	-.32**	-.23**	.39**	.20**	.30**	.26**	-.01	.13**	.04	-.07**	-															
20. insight	.03	-.28**	.21**	.26**	.20**	.17**	.05	.01	-.24**	-.11**	.13**	.09**	.02	.19**	.05	.16**	.03	.03	.67**	-														
21. cause	.23**	-.13**	-.04	-.06*	-.17**	-.20**	-.23**	.00	-.02	-.09**	.13**	.11**	.12**	.07**	-.08**	-.03	-.07**	-.16**	.45**	.14**	-													
22. discrep	-.17**	-.05*	.24**	.25**	.21**	.08**	.04	-.02	-.24**	-.19**	.15**	.08**	.07**	.17**	-.04	.08**	.03	-.08**	.51**	.18**	.16**	-												
23. tentat	-.07**	-.14**	.26**	.18**	-.02	-.08**	-.14**	-.03	-.15**	-.12**	.39**	.15**	.35**	.12**	-.04	.02	.03	-.01	.69**	.35**	.11**	.33**	-											
24. certain	-.08**	-.03	.12**	.17**	.14**	.12**	.08**	-.02	-.17**	-.14**	.07**	-.02	.27**	.19**	.08**	.09**	.08**	.02	.37**	.19**	-.09**	.14**	.12**	-										
25. differ	-.03	-.13**	.28**	.19**	.03	-.06*	-.08**	.03	-.24**	-.22**	.38**	.24**	.26**	.15**	.04	.11**	.03	-.08**	.72**	.29**	.19**	.34**	.56**	.16**	-									
26. social	-.25**	-.15**	.24**	.49**	.61**	.14**	.50**	.41**	-.43**	-.27**	-.05	.07**	-.10**	.27**	.20**	.14**	.13**	.03	.14**	.19**	-.09**	.16**	.02	.14**	.12**	-								
27. affiliation	.08**	-.08**	.00	.07**	.11**	-.24**	-.08**	.03	-.15**	.02	-.03	.01	.09**	.08**	.00	-.01	-.02	-.15**	.06*	.05	.10**	.09**	-.05*	-.01	.05*	.44**	-							
28. achieve	.26**	.04	-.20**	-.16**	-.07**	-.08**	-.05*	.05	-.05	.07**	-.14**	-.08**	.04	.27**	-.02	.03	-.07**	-.28**	.10**	.06*	.26**	.07**	-.04	-.04	.02	.00	.11**	-						
29. power	.22**	.10**	-.25**	-.25**	-.09**	-.07**	.09**	.24**	.03	.12**	-.26**	-.17**	-.04	.08**	.34**	.20**	.00	-.30**	-.11**	-.08**	-.01	.02	-.19**	.02	-.05	.15**	.05	.29**	-					
30 focuspresent	-.35**	-.12**	.42**	.43**	.16**	-.11**	-.16**	-.03	-.26**	-.35**	.46**	.11**	.16**	.14**	-.15**	-.12**	.09**	.07**	.37**	.16**	.21**	.25**	.37**	.06*	.33**	.23**	.14**	-.05*	-.16**	-				
31. home	-.07**	.03	-.07**	.02	.18**	.19**	.22**	.12**	-.08**	.03	-.18**	.02	-.08**	-.02	.04	.05*	.02	-.05	-.22**	-.17**	-.18**	-.05	-.17**	-.02	-.17**	.18**	.05*	-.02	.06*	-.22**	-			
32. informal	-.30**	-.01	.17**	.26**	.20**	.15**	.02	-.07**	-.21**	-.34**	.28**	.04	.06*	.31**	.02	-.04	.38**	.16**	.16**	.08**	-.03	.09**	.17**	.12**	.12**	.12**	-.09**	-.11**	-.09**	.28**	-.06**	-		
33. nonflu	-.20**	-.03	.17**	.16**	.08**	.01	.00	-.04	-.11**	-.22**	.31**	.08**	.07**	.24**	-.06*	-.04	.11**	.06*	.17**	.09**	.00	.09**	.16**	.11**	.14**	.07**	-.06*	-.06*	-.07**	.24**	-.08**	.69**	-	
34. filler	-.17**	-.05*	.11**	.15**	.12**	.13**	.08**	-.04	-.09**	-.15**	.08**	.04	.01	.07**	.00	.00	.10**	.12**	.04	.00	-.05*	.04	.06*	.06**	.03	.04	-.09**	-.10**	-.11**	.09**	.03	.30**	.14**	-

Note. M = Mean, SD = Standard deviation. LIWC variables were log-transformed ln(x+1). M = Mean, SD = Standard deviation. * $p < .05$, ** $p < .01$, ** $p < .001$

PSYCHOLOGICAL ADAPTATION DURING TRANSLATION – SUPPLEMENTAL MATERIAL

Table S12. Inter-correlations between the dependent variables of the model reported in Table S6, TED *speaker*'s language use in "Translated Subsample" ($N = 544$).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
M	2.93	1.06	4.04	2.81	2.22	1.16	0.45	0.74	2.13	2.68	1.91	2.10	1.20	1.27	0.25	0.20	0.03	1.21	2.53	1.23	1.09	0.90	1.24	0.85	1.40	2.38	1.36	0.90	1.19	2.47	0.23	0.34	0.17	0.01
SD	0.16	0.28	0.06	0.17	0.26	0.52	0.40	0.29	0.15	0.10	0.19	0.16	0.19	0.26	0.24	0.20	0.06	0.29	0.17	0.23	0.21	0.20	0.22	0.18	0.19	0.26	0.32	0.24	0.27	0.21	0.18	0.20	0.13	0.03
1. Sixltr	-																																	
2. number	.02	-																																
3. function	-.63**	-.36**	-																															
4. pronoun	-.67**	-.27**	.75**	-																														
5. ppron	-.58**	-.18**	.49**	.84**	-																													
6. i	-.40**	-.18**	.34**	.60**	.75**	-																												
7. shehe	-.26**	-.08	.20**	.36**	.50**	.35**	-																											
8. they	.04	-.01	-.07	.04	.12**	-.13**	.08	-																										
9. article	.22**	.10*	-.15**	-.54**	-.60**	-.43**	-.24**	-.12**	-																									
10. prep	.33**	-.01	-.16**	-.42**	-.39**	-.27**	-.13**	-.01	.24**	-																								
11. adverb	-.32**	-.15**	.52**	.24**	-.01	-.08	-.17**	-.15**	-.08	-.23**	-																							
12. conj	-.26**	-.23**	.45**	.28**	.21**	.20**	.06	-.02	-.21**	-.27**	.37**	-																						
13. quant	.03	.16**	-.13**	-.15**	-.24**	-.25**	-.32**	.01	-.04	.02	.21**	-.04	-																					
14. posemo	-.05	-.14**	-.01	.20**	.26**	.24**	.13**	.07	-.31**	-.29**	.01	.08*	.08	-																				
15. anger	.11**	-.07	-.13**	-.08	.04	.11**	.16**	.15**	-.04	.01	-.19**	-.13**	-.06	.09*	-																			
16. anx	.13**	-.12**	-.08	.02	.13**	.18**	.08	.02	-.25**	-.04	-.08	.02	-.04	.14**	.35**	-																		
17. swear	-.22**	-.04	.04	.22**	.25**	.25**	.12**	-.03	-.15**	-.23**	-.02	-.09*	-.10*	.19**	.24**	.14**	-																	
18. percept	-.40**	-.16**	.22**	.37**	.37**	.37**	.18**	-.17**	-.07	-.21**	.07	.14**	-.11**	.09*	-.10*	-.07	.15**	-																
19. cogproc	-.03	-.32**	.31**	.26**	.10*	.03	-.09*	-.01	-.27**	-.23**	.38**	.18**	.28**	.25**	.03	.16**	.09*	-.06	-															
20. insight	-.02	-.35**	.24**	.30**	.23**	.18**	.06	.03	-.26**	-.14**	.12**	.12**	.02	.21**	.02	.15**	.10*	.09*	.68**	-														
21. cause	.20**	-.12**	-.04	-.03	-.12**	-.14**	-.21**	.06	-.04	-.12**	.12**	.07	.10*	.10*	.00	.03	-.01	-.14**	.47**	.17**	-													
22. discrep	-.14**	-.02	.21**	.23**	.19**	.07	.01	-.02	-.22**	-.20**	.15**	.07	.04	.14**	-.02	.08	.09*	-.09*	.50**	.17**	.14**	-												
23. tentat	-.07	-.19**	.23**	.09*	-.10*	-.14**	-.19**	-.06	-.07	-.10*	.42**	.13**	.39**	.09*	-.06	-.03	.01	-.04	.69**	.35**	.13**	.32**	-											
24. certain	-.10*	-.03	.16**	.18**	.15**	.12**	.10*	-.04	-.13**	-.12**	.07	.01	.26**	.20**	.11**	.12**	.13**	-.03	.39**	.19**	-.05	.20**	.15**	-										
25. differ	.00	-.18**	.25**	.11*	-.02	-.09*	-.13**	-.03	-.19**	-.17**	.38**	.21**	.25**	.12**	.04	.14**	.02	-.13**	.72**	.29**	.21**	.38**	.58**	.17**	-									
26. social	-.30**	-.09*	.23**	.52**	.64**	.18**	.51**	.42**	-.47**	-.27**	-.08	.07	-.10*	.27**	.17**	.09*	.14**	.06	.11**	.20**	-.10*	.14**	-.03	.14**	.08	-								
27. affiliation	.09*	-.03	-.04	.05	.11*	-.28**	-.14**	.13**	-.16**	.03	-.05	-.01	.09*	.05	-.03	-.02	-.09*	-.15**	.04	.03	.03	.06	-.03	.04	.06	.45**	-							
28. achieve	.26**	.04	-.22**	-.14**	-.06	-.08	-.11**	.11*	-.10*	.06	-.14**	-.13**	.02	.26**	-.04	.03	-.05	-.28**	.06	.03	.25**	.06	-.05	-.07	.01	.01	.16**	-						
29. power	.22**	.07	-.28**	-.23**	-.06	-.02	.12**	.27**	-.01	.10*	-.30**	-.20**	-.08	.15**	.43**	.18**	.02	-.30**	-.13**	-.15**	.02	.02	-.19**	.03	-.07	.17**	.06	.27**	-					
30. focuspresent	-.36**	-.14**	.40**	.40**	.14**	-.11*	-.16**	.02	-.23**	-.34**	.42**	.06	.15**	.16**	-.16**	-.15**	.09*	.02	.35**	.17**	.21**	.25**	.34**	.07	.31**	.25**	.17**	-.02	-.14**	-				
31. home	-.10*	.01	-.03	.14**	.29**	.27**	.24**	.09*	-.20**	-.05	-.18**	.06	-.10*	-.02	.01	.03	.04	.05	-.22**	-.14**	-.20**	-.01	-.17**	-.05	-.18**	.22**	.05	.00	.06	-.17**	-			
32. informal	-.33**	.00	.17**	.24**	.19**	.15**	.02	-.14**	-.15**	-.40**	.31**	.04	.08	.33**	-.05	-.04	.34**	.18**	.15**	.08	-.04	.10*	.18**	.15**	.09*	.10*	-.09*	-.15**	-.08	.26**	-.02	-		
33. nonflu	-.22**	-.06	.18**	.15**	.09*	.01	-.03	-.14**	-.09*	-.24**	.34**	.10*	.13**	.26**	-.09*	-.06	.10*	.08	.17**	.06	.04	.09*	.19**	.11*	.12**	.05	-.01	-.10*	-.09*	.21**	-.10*	.71**	-	
34. filler	-.17**	-.05	.13**	.14**	.11**	.15**	.07	-.04	-.05	-.16**	.09*	.07	.07	.08	-.03	-.03	.09*	.12**	.02	-.06	-.06	.04	.08	.03	-.01	-.02	-.13**	-.17**	-.11**	.07	.14**	.28**	.09*	-

Note. M = Mean, SD = Standard deviation. LIWC variables were log-transformed ln(x+1). M = Mean, SD = Standard deviation. * $p < .05$, ** $p < .01$, ** $p < .001$

PSYCHOLOGICAL ADAPTATION DURING TRANSLATION – SUPPLEMENTAL MATERIAL

Table S13. Inter-correlations between the dependent variables of the model reported in RQ1, TED translator's language use ("Translated Subsample, $N = 544$).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
M	3.29	0.97	4.00	2.90	2.35	1.19	1.33	0.99	2.47	2.39	1.59	2.58	1.36	1.34	0.20	0.16	0.02	1.09	2.80	1.24	1.25	1.11	1.38	1.35	1.64	2.63	1.39	1.49	0.91	1.79	0.19	0.86	0.03	0.03
SD	0.14	0.29	0.05	0.16	0.24	0.54	0.28	0.30	0.14	0.12	0.17	0.10	0.18	0.23	0.20	0.17	0.05	0.25	0.14	0.22	0.18	0.18	0.20	0.21	0.16	0.19	0.32	0.16	0.25	0.24	0.16	0.26	0.06	0.05
1. Sixltr	-																																	
2. number	.06	-																																
3. function	-.67**	-.39**	-																															
4. pronoun	-.70**	-.30**	.78**	-																														
5. ppron	-.60**	-.30**	.60**	.85**	-																													
6. i	-.56**	-.21**	.45**	.63**	.74**	-																												
7. shehe	-.28**	-.21**	.27**	.37**	.48**	.13**	-																											
8. they	-.16**	-.09*	.17**	.26**	.34**	.01	.78**	-																										
9. article	.31**	.08	-.20**	-.50**	-.62**	-.54**	-.20**	-.17**	-																									
10. prep	.38**	.12**	-.32**	-.45**	-.23**	-.13**	-.13**	-.15**	.09*	-																								
11. adverb	-.14**	-.04	.29**	.13**	.04	.10*	-.10*	-.09*	-.17**	-.13**	-																							
12. conj	-.33**	-.24**	.52**	.30**	.12**	.14**	-.07	-.08	-.14**	-.28**	.30**	-																						
13. quant	-.03	.14**	.11*	.03	-.19**	-.11**	-.26**	-.11*	-.02	-.20**	.40**	.19**	-																					
14. posemo	-.18**	-.14**	.08	.24**	.24**	.18**	.14**	.15**	-.28**	-.29**	.10*	.09*	.05	-																				
15. anger	.08	-.08*	-.04	-.05	.06	.07	.18**	.17**	-.05	.05	.01	-.08	-.10*	-.03	-																			
16. anx	.03	-.11*	.03	.09*	.17**	.19**	.06	.05	-.22**	.03	.03	.00	-.02	.06	.41**	-																		
17. swear	-.10*	-.08	.08	.13**	.12**	.11**	.06	.04	-.03	-.18**	.02	-.02	.04	.03	.28**	.16**	-																	
18. percept	-.37**	-.18**	.19**	.33**	.30**	.26**	.15**	.00	-.08	-.16**	-.01	.05	-.15**	.13**	-.11*	-.09*	.02	-																
19. cogproc	-.08	-.25**	.35**	.28**	.09*	.06	-.09*	-.02	-.24**	-.34**	.47**	.37**	.41**	.26**	-.03	.12**	.05	-.01	-															
20. insight	-.14**	-.37**	.32**	.38**	.33**	.27**	.10*	.07	-.28**	-.25**	.17**	.21**	.01	.23**	-.07	.15**	.10*	.15**	.62**	-														
21. cause	-.13**	-.17**	.28**	.20**	-.02	-.06	-.08	.01	.00	-.35**	.30**	.38**	.24**	.14**	-.12**	-.08	.08	.07	.56**	.22**	-													
22. discrep	-.20**	-.12**	.33**	.30**	.18**	.11**	.06	.07	-.22**	-.35**	.19**	.28**	.17**	.18**	.06	.14**	.10*	-.09*	.56**	.23**	.26**	-												
23. tentat	-.07	-.08	.23**	.16**	.02	-.04	-.07	.02	-.18**	-.25**	.46**	.29**	.45**	.17**	-.05	.08	.02	-.06	.70**	.29**	.33**	.46**	-											
24. certain	-.21**	-.06	.32**	.32**	.22**	.14**	.08	.09*	-.27**	-.32**	.21**	.15**	.30**	.18**	.13**	.19**	.07	-.10*	.60**	.36**	.11**	.43**	.33**	-										
25. differ	-.02	-.19**	.26**	.17**	.08	.04	-.04	.00	-.22**	-.20**	.38**	.32**	.24**	.11**	.13**	.19**	.02	-.07	.69**	.30**	.19**	.53**	.59**	.48**	-									
26. social	-.28**	-.18**	.35**	.49**	.52**	.10*	.53**	.52**	-.39**	-.28**	-.01	.06	-.08	.24**	.18**	.09*	.05	.05	.22**	.27**	.04	.26**	.16**	.38**	.18**	-								
27.affiliation	.19**	-.01	-.04	-.01	.06	-.33**	-.09*	.02	-.05	.04	-.04	.00	.01	.00	.00	-.02	-.06	-.12**	.05	.05	.03	.06	.03	.12**	.04	.48**	-							
28. achiev	.05	.00	-.01	.03	-.01	-.03	-.04	.04	-.08	-.03	.04	.03	.13**	.36**	-.04	-.01	.02	-.03	.26**	.15**	.34**	.13**	.09*	.09*	.00	.06	.13**	-						
29. power	.17**	.03	-.14**	-.19**	-.09*	-.05	.14**	.19**	.03	.07	-.14**	-.17**	-.11*	.10*	.39**	.18**	.03	-.29**	-.02	-.03	-.10*	.04	-.08	.15**	.01	.23**	.08	.13**	-					
30. focus-present	-.32**	-.09*	.35**	.29**	.00	.00	-.08	.02	.03	-.52**	.14**	.22**	.27**	.19**	-.14**	-.14**	.04	.12**	.32**	.14**	.31**	.19**	.24**	.19**	.16**	.13**	-.07	-.03	-.06	-				
31. home	-.16**	-.07	.08	.14**	.22**	.21**	.10*	.06	-.19**	.10*	-.10*	-.01	-.13**	-.06	.03	.02	.00	.04	-.08*	.03	-.10*	-.02	-.07	-.02	.00	.16**	.07	-.04	.08	-.12**	-			
32. informal	-.45**	.01	.30**	.38**	.18**	.10*	.06	.06	-.19**	-.54**	.16**	.22**	.16**	.27**	-.13**	-.08	.13**	.18**	.29**	.25**	.32**	.22**	.24**	.22**	.09*	.20**	-.04	.04	-.15**	.41**	-.06	-		
33. nonflu	-.40**	-.07	.18**	.27**	.21**	.26**	.08	-.02	-.17**	-.34**	.11**	.14**	-.01	.13**	-.02	-.06	.09*	.20**	.07	.08*	.12**	.05	.05	.07	.01	.07	-.17**	-.05	-.12**	.24**	.00	.42**	-	
34. filler	-.21**	-.01	.15**	.12**	.07	.13**	.00	-.06	-.05	-.22**	.16**	.17**	.08	.07	-.05	-.02	.11**	.08	.05	.01	.20**	.02	.11*	.01	-.03	-.07	-.16**	.04	-.11*	.13**	-.01	.29**	.16**	-

Note. M = Mean, SD = Standard deviation. LIWC variables were log-transformed ln(x+1). M = Mean, SD = Standard deviation. * $p < .05$, ** $p < .01$, ** $p < .001$

PSYCHOLOGICAL ADAPTATION DURING TRANSLATION – SUPPLEMENTAL MATERIAL

Research Question 2.

Table S14. Inter-correlations between the dependent variables (differences of z-transformed LIWC scores) in RQ2 ($N = 544$).

LIWC variables (difference scores)	*M*	*SD*	1	2	3	4	5	6	7
1. number_Diff	0.00	0.41	-						
2. ppron_Diff	0.00	0.35	-0.05	-					
3. i_Diff	0.00	0.11	0.07	.29**	-				
4. shehe_Diff	0.00	0.73	0.00	.29**	-0.06	-			
5. they_Diff	0.00	0.79	-.09*	.26**	-0.08	-0.03	-		
6. article_Diff	0.00	0.61	-0.01	-.12**	-.10*	.09*	-0.03	-	
7. conj_Diff	0.00	0.84	-0.03	-0.03	-0.02	-0.03	-0.02	0.03	-

* $p < .05$, ** $p < .01$, ** $p < .001$

Note. *M* = Mean, *SD* = Standard deviation. LIWC variables r difference scores of z-transformed LIWC scores "translator minus speaker". Difference scores < 0 mean that the according category was used less often by the translator than by the original speaker.