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Foreword

This issue brings eleven new and fresh perspectives on linguistic issues, some accounting for phenomena in linguistics proper and some interdisciplinary in nature.

The opening article by Irfana M. and Sreedevi N. studies consonantal coarticulation resistance in Hindi native speakers in the context of ultrasound imaging. This carefully constructed phonetic study throws some new light on the complex issue of coarticulation in present-day phonetics.

The next study by Anh-Thur T. Nguyễn explores the area of English rhythm and metrics from the perspective of Vietnamese English learners. A contrastive study of English and Vietnamese suggests that the stress-timed pattern of English rhythm is acquired gradually in this group of speakers.

The third article in this volume written by Shoja Tafakkori Rezayi and Hossein Moghani aims at studying a selection of biography texts in relation to their thematic progression. This particular writing register has its own linguistic specificities as the linguistic analysis suggests.

C. Cecilia Tocaimaza-Hatch's study investigates formal register in the speech of heritage speakers and L2 speakers of Spanish as expressed through their lexical choices. The analysis shows that L2 speakers are confident in their ability to move within the register continuum while heritage speakers behave differently.

In the next article, Filiz Mergen and Gulmira Kuruoglu also explore the differences between bilinguals and monolinguals. The aim of the paper is to find out how lexical processing is represented in monolingual Turkish speakers and bilingual Turkish-English speakers.

Firqin Sumartono and Ying-Ying Tan's article investigates the nature of code-switching in the bilingual Malay-English community in Singapore. Even though code-switching is not highly welcome in the Singaporean context, its frequency and functions in the Malay community exhibit regular patterns.

Article semantics is the focus of the next article written by Abdelkader Hermas. This study investigates the sources of article semantics in the acquisition of L3 English by L1 Arabic-L2 French adult learners in a foreign language setting. Expectedly, the more advanced level of English proficiency, the more successful acquisition of the intrinsic meanings of the English article system.

Yu-Ching Tseng's article discusses universal syntax from the perspective of optimality theory in three diverse Austronesian languages. This linguistic theory is capable of accounting for syntactic phenomena manifested differently in Tagalog, Atayal, and Tsou.

Roger Nunn, Tanju Deveci, Ikhlas Khan and Nader Ayish's study examines the use of first-person voice in scientific journal papers in relation to transitivity choices. Even though the authors of *Nature* were asked to use first person in their papers, some patterns of use of first person singular and plural may be established as evidenced by the analysis.

The complex relationship between a language community and language use in it is dealt with in Nikola Dobrić's article. Various linguistic manifestations of discrimination are explored in the corpus linguistics framework in four diverse languages: German, Romanian, Serbian and Slovene.

The concluding article draws conclusions in the area of translation studies. The data is collected from two Persian novels rendered into English. The nature of the transfer of culturally specific items into English and the strategies applied during the transfer are analysed in this paper coauthored by Zeinab Ostad and Mehrdad Vasheghani Farahani.

The Editorial of *The Linguistics Journal* hopes that such a diverse mosaic of linguistic papers presented in this issue will inspire the reader to explore the fantastic field of language science.

Prof. Biljana Čubrović, B.A., M.A., Ph.D.

Chief Editor, *The Linguistics Journal*

Consonantal Coarticulation Resistance in Hindi: An Ultrasound Imaging Study

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Abstract

The term consonantal coarticulation resistance refers to the degree to which a given consonant resists potential interference of neighbouring segments. The sounds showing greater coarticulation resistance also exert stronger influence on neighbouring vowels and consonants and exhibit less contextual variation. The present study aims to analyse consonantal coarticulation resistance based on an ultrasound imaging technique. Thirty adult Hindi speakers participated as subjects. The stimuli consisted of V₁CV₂ sequences, with C corresponding to the voiced/voiceless counterparts of dental stops (/t̪/, /d̪/), retroflex stops (/ɖ/, /ɗ/) or velar stops (/k/, /g/) in the context of vowels /a, i, u/. Measurements of coarticulation resistance of consonants were carried out based on Root Mean Square (RMS) distance between the tongue contours of the consonant and vowel pair. Results showed that there was significantly greater coarticulation resistance of retroflex consonants followed by velar and dental consonants. This result is fully consistent with the degree of articulatory constraint (DAC) model.

Keywords

Coarticulation, Hindi, Ultrasound, Consonants, Coarticulation Resistance

The coarticulation resistance of a consonant is its ability to withstand the influence of neighboring segments. Coarticulation resistance is inversely proportional to the amount of linguopalatal contact associated with lingual consonants and also to a segment's degree of

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sonority (Recasens, 1985). Sounds that are resistant to coarticulation also exert stronger influence on neighboring vowels and exhibit less contextual variation.

Fowler and Brancazio (2000) observed that phonetic segments can differ in the extent to which they resist coarticulation overlap, with the magnitude of resistance determined by the mutual incompatibility of their gestures with those of sequentially adjacent or nearby segments. In a related line of research, Recasens (1984) reported that coarticulation resistance changes as a property of the consonant rather than the syllable, and explained that resistance of coarticulation effects is related to the tongue dorsum constraints against the palate. Coarticulation resistance was found to be greater for palato-alveolar consonants followed by dentals and then by bilabials. Recasens, Pallarès and Fontdevila (1997) proposed the Degree of Articulatory Constraint (DAC) model to explain the relationship between tongue dynamics and the property of coarticulation resistance in speech production. According to this model, coarticulation resistance should increase with the degree of articulatory constraint, that is, with the mechano-inertial properties of the articulators and their involvement in the formation of a constriction. The present study hypothesizes that Hindi, an Indo-Aryan language, follows the same pattern of coarticulation as proposed by the DAC model, specifically for consonants such as dentals, retroflexes and velars in different vowel contexts.

As reported in the literature, compared to back vowels /a/ and /u/, the front vowel /i/ shows maximum resistance to coarticulation in many languages, including American English (Stevens & House, 1963), Dutch (Pols, 1977) and Catalan (Recasens, 1985). The vowel /i/ also shows decreased palatal contact when adjacent to velarized consonants (Russian: Kuznetsov & Ott, 1987) and pharyngealized consonants (Arabic: Yeou, 1995). Coarticulation effects on the activity of primary articulators depend on articulatory flexibility, inter-articulatory coordination, coupling and antagonism. Concerning dentoalveolar consonants, laminal fricatives (/s, z/) appear to be more resistant to coarticulation effect than apicals (/t, d, n, l/) (British English: Bladon & Nolan, 1977). In German the degree of variability usually decreases in the progression [n] > [l] > [d] > [t] > [s] (Hoole, Gfroerer & Tillmann 1990). Indeed, Catalan electropalatographic data reveal lesser vowel coarticulation at the place of articulation for lingual fricatives than for [n] and [l] (Recasens 1991). The apico-alveolar tap [ɾ] is also highly sensitive to coarticulation effects at the place of articulation (Japanese: Sudo, Kiritani & Yoshioka, 1982; Catalan: Recasens 1991).

Coarticulation trends at the dentoalveolar place of articulation are often conditioned by the tongue dorsum positioning. The closure location for the English alveolar [t] may be

fairly front when the tongue dorsum is lowered with an adjacent [a] and is more laminal and retracted when the tongue dorsum is raised for an adjacent [i]. On the other hand, the Italian apicodental [t] is highly resistant to such vowel-dependent coarticulation effects, presumably because it is articulated further away from the tongue dorsum (Farnetani, Hardcastle & Marchal, 1989). Velar consonants are realized at the medio-postpalatal zone before [i] and other front vowels (Swedish: Ohman, 1966; American English: Kent & Moll, 1972). In Catalan, the dorsal closure for [k] is more fronted when the consonant is adjacent to [i] than to [a] and [u] (Recasens, 1985). According to the study data on Japanese VCV sequences (Wada, Yasumoto, Iteoka, Fujiki, & Yoshinaga, 1970), velars present as many places of articulation as there are constriction locations for adjacent vowels. Electromagnetic articulography (EMA) data for German VCV sequences (Mooshammer, Hoole & Kuhnert, 1993) revealed that the tongue dorsum movement towards the medio-postpalatal zone during the velar stop closure period even when [i] is absent.

The present study considers only stop consonants to control the variability in manner of articulation. There is not much research in the area of coarticulation resistance of stop consonants, and especially retroflexes, using imaging techniques such as ultrasound. The production of retroflex consonants is fairly complex, as the front of the tongue should produce a precise angle of retroflexion in order to make a constriction against the palate (Švarný & Zvelebil, 1955). The Hindi retroflex stop /ɭ/ is produced at the alveolar zone in the context of back vowels and at the dentoalveolar zone in the context of [i], presumably because the curling back of the tongue front for the execution of the consonant is hard to reconcile with the simultaneous raising of the tongue dorsum (Dixit & Flege, 1991). The degree of retroflexion was found to vary based on the context: a greater degree of negative curvature is shown in the contexts of back vowels /a/ and /u/ than in the context of high front vowel /i/ in Tamil (Smith, Proctor, Iskarous, Goldstein & Narayanan, 2013). Kochetov & Sreedevi (2013) reported that labials had more coarticulation than dentals followed by retroflex places of articulation in Kannada.

Since there are contradicting reports in the literature regarding the effect of voicing, voiced counterparts of each place of articulation were also considered. Based on the acoustic studies there is a tendency for F1 values to be lower in the environment of voiced consonants (Stevens & House, 1963; Hillenbrand, Clark & Nearey, 2001). In Australian English, no significant difference between voiced and voiceless stop consonants were found using EPG,

but there were differences in the acoustical analysis especially for F2 onset for /d/ at stop burst release (Tabain, 2002).

Articulatory dynamics have been studied extensively in many of the world's languages, including Dravidian languages such as Malayalam (Scobbie, Punnoose, & Khattab, 2013; Sindusha, Irfana & Sreedevi, 2014) and Kannada (Kochetov, Sreedevi, Kasim, & Manjula, 2014; Kochetov & Sreedevi, 2015) as well as the Indo-Aryan language Hindi (Švarný & Zvelebil, 1955; Ladefoged & Bhaskararao, 1983; Krull & Lindblom, 1996), but support for the relation between articulatory dynamics and coarticulation has been found in Kannada (Kochetov et al. 2014; Kochetov & Sreedevi, 2015). The phonological and phonetic structures of Indian languages are distinct from most of the other language that have been studied.

Method

Participants

Thirty randomly selected native adult speakers of Hindi, including equal number of males and females, served as subjects for this study. All of them were considered after an oro-motor examination and were excluded when identified with speech, language, hearing or any cognitive deficits based on the informal assessment by a trained speech language pathologist.

Materials

The test materials consisted of meaningless V₁CV₂ sequences with C corresponding to voiced and voiceless counterparts of dental stops (/t̪/, /t̪ʰ/), retroflex stops (/ɖ/, /ɖʰ/), or velar stops (/k/, /g/), vowels were either high front /i/, low central /a/, or high back /u/, where V₁ and V₂ were identical for each nonce word. Table 1 shows the test items. The participants were instructed to repeat each target item, embedded in a short carrier phrase (“/mɛabi CVC bo:l̪iɦum/”), ten times.

Table 1. Stimuli list of V₁CV₂ sequences. Consonants at three places of articulation in the context of vowel V₁ and V₂ (/a, i, u/).

Vowels	Places of articulation					
	Dental		Retroflex		Velar	
	Voiced	Unvoiced	Voiced	Unvoiced	Voiced	Unvoiced
Low central	/aɖɖa/	/aɖʱa/	/aɖɖa/	/aɖʱa/	/agga/	/akka/

High front	/iddi/	/itti/	/iddi/	/itti/	/iggi/	/ikki/
High back	/uddu/	/uttu/	/uddu/	/uttu/	/uggu/	/ukku/

Instruments

The methodology for collecting and analysing ultrasound data was adapted from Irfana and Sreedevi (2016). To give some background, an ultrasound works on the reflective principle of sound waves. When a pulse of acoustic energy is directed at an object with suitable conductivity, it puts the object into oscillation and elicits echoes. In an ultrasound tongue imaging technique, when the sound wave travels upward from the probe through the tongue body, it is reflected downward from the upper tongue surface. The upper tongue surface typically interfaces with the palate bone and airway, both of which have very different densities from the tongue, causing a strong echo. When the signal passes through air or bone, the sound wave is lost and no echo is passed back to the transducer because the conductivity for the sound is either too low (bone) or too high (air) (Bressmann, Ackloo, Heng & Irish, 2007). This resultant absence of echo leads to the formation of the ultrasound tongue image.

In the present study, the instrument Mindray ultrasound 6600 was used to obtain the ultrasound tongue images and the software Articulate Assistant Advanced (AAA) ultrasound module Version 2.14 (Articulate Instrument, Wrench & Scobbie, 2011) was used for the analysis with 60 frames per second. It was synchronized to the audio input with a sample rate of 22,050 Hz. The hardware pulse generated a tone frequency of 1000 Hz with a beep length of 50 ms for accurate synchronisation. Some of the Mindray ultrasound 6600 parameters used were: edge enhancement set at 3, with noise restriction of zero; smooth and soften functions set at 2 (which helped to suppress the tongue image noise). The transducer, a long-handled microconvex probe, operating at 6.5 MHz, was placed beneath the chin of the participant with the support of a stabilization headset (Articulate Instrument, Scobbie, Wrench & van der Linden, 2008). Each ultrasound frame was stored by the AAA system as a set of raw echo-pulses with a depth of 7 mm, facilitating a standard two dimensional image. The instrument setup used is shown in Figure 1.



Figure 1. Instrument setup: 1. Stabilization headset, 2. Transducer probe, 3. Conduction gel, and 4. Ultrasound instrument (Phonology Lab, Department of Speech Language Sciences, All India Institute of Speech and Hearing, Mysore).

The ultrasound imaging system provides three modes of recording including amplitude (A-Mode), motion (M-Mode) and brightness (B-Mode). The present study employed the B-Mode since it has a wide gray scale; this helps to visualize even very small differences in echogenicity in the borders between different structures, including cartilage, bone and layers of tongue tissue. The grey scale depicts the density of the tissue whereas the solid areas are depicted in white and the fluid areas in black. The interface between the tongue and the air is visible as a bright white band. Figure 2 depicts the midsagittal ultrasound image of vowel /a/. The midsagittal plane is preferentially used in ultrasound imaging as the image is most intuitive and can be compared across different speakers.



Figure 2. Midsagittal image of vowel /a/. The anterior tongue is towards the right side.

Data collection

Individual participants were seated comfortably on a high back chair. They were briefed on the test procedure before the recording and were asked to sip water before the recording to moisturize the oral cavity for better ultrasound images. The transducer probe placed beneath the chin was smeared with ultrasound transmission gel (Aquasonic 100) for superior tongue imaging. The probe was fastened by a stabilization headset (Articulate Assistant Advanced) to reduce the artefacts caused by head movements. For recording the speech sample, a headphone (*iball i 333*) was used. The stimulus list was presented orthographically on a computer screen to one participant at a time; 10 repetitions of each prompt were recorded for further analysis. A total of 5400 utterances (30 participants x 180 = 5400) were recorded for each language. A grand total of 16,200 utterances (30 x 3 = 90 participants x 180 = 16200) were analysed for the study.

Analysis

For analysis, the software AAA was used with the “fan spline” technique, which employs 42 axes or points. Splines are curves defined by a mathematical function that are constrained to pass through specified points. Different fan spline setups were decided for each place of articulation. For dental and retroflex sounds, the fan spline had to be set more anteriorly, and for velars, more towards the posterior region. Semi-automatic contour plotting of midsagittal views was used in this study. Individual token splines for each consonant and vowel were used to create mean splines, based on the means of 42 fan splines.

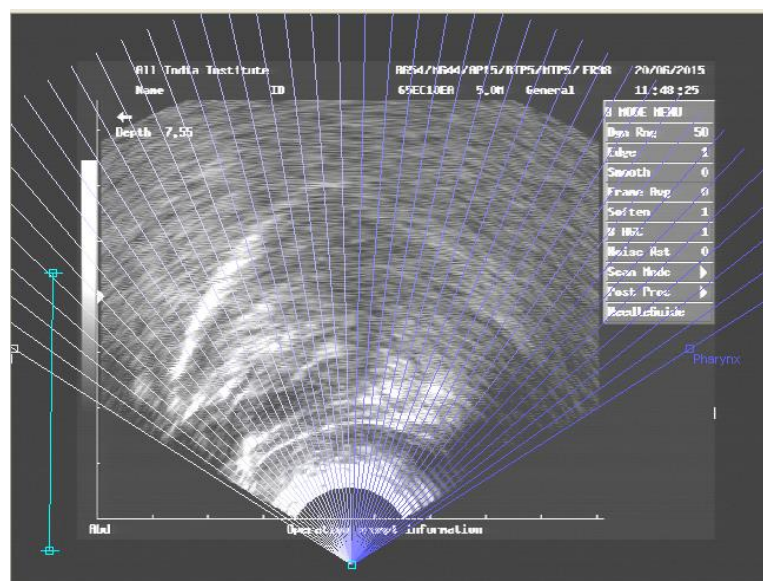


Figure 3. 42 fan splines embedded on a tongue contour image of vowel /a/

The coarticulation resistance of retroflexes was calculated three ways: (a) in relation to both vowels, (b) in relation to V1, and (c) in relation to V2. For this, the difference between the tongue contours in each recorded syllable was measured. The tongue contour of each repetition of each phoneme was plotted to find the difference between V and C of one token. An average tongue contour representing 10 repetitions was obtained for each phoneme in the AAA workspace to minimize the variation. Averaged C spline and V₁/V₂ spline were considered as an analysis pair. These pairs of mean and standard deviation splines were further evaluated using the function “Diff”. This function works based on 2-tailed t-test using the Welch-Satterthwaite equation, which is part of the AAA software. This helps to compare two mean splines and provides Root Mean Square (RMS) distance. The resulting RMS distance values were considered as Extent of Coarticulation since it is the distance between the analysis pair. Coarticulation Resistant of Consonant (CR) was found by using the formula given by Zharkova (2007):

$$CR_{C(V1-V2)} = \frac{(C-V)}{(C_{V1}-C_{V2})} \times 10$$

In the above equation, the numerator (C-V) indicates the averaged value of RMS of both V1 and V2 contexts. The denominator (C_{V1} – C_{V2}) was obtained as an RMS distance between tongue contours of C in different vowel contexts.

Data did not follow normality for most of the independent variables, i.e. coarticulation resistance of consonants. However the Non-parametric Friedman test was used to obtain the overall effect of independent variables within the language. In the presence of any significant difference, the Wilcoxon signed ranks test was employed for pair-wise comparison of dependent variables.

Results

Tongue contours of consonants across different vowel contexts

Average tongue contours for each phoneme in the VCV sequence are shown in Figure 4. The tongue contour of dentals and velars varied based on the adjacent vowels, whereas, vowels were affected most when they occurred with retroflexes. This pattern was more evident for the tongue contour of the following vowel.

Comparison of Coarticulation Resistance of Consonants (CRC) across three places of articulation

Coarticulation resistance of consonants was explored as a comparison within two different vowel contexts. Hence, there were three vowel pairs, i.e. (/a/, /i/), (/a/, /u/), (/i/, /u/). Mean, median and standard deviation are explained in Table 2. Coarticulation resistance was high for retroflexes in all three vowel pair contexts. The least resistance was observed for the voiceless velar consonant in the context of /i/ and /u/.

Table 2. Descriptive statistics of Coarticulation Resistance of Consonant (CRC) across three vowel combinations based on all speakers

Tokens	(/a/,/i/)			(/a/,/u/)			(/i/,/u/)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
CRC(t)	4.17	12.85	6.17	3.11	23.08	.02	4.82	20.92	22.65
CRC(d)	7.65	13.52	0.39	5.98	22.26	5.69	8.93	15.70	12.46
CRC(ʈ)	6.00	21.72	6.94	5.11	28.09	8.55	2.46	20.88	24.72
CRC(ɖ)	3.97	23.82	.19	5.44	27.81	4.18	8.48	30.00	16.36
CRC(k)	2.05	10.87	.29	5.00	25.75	2.76	2.35	11.37	5.69
CRC(g)	6.53	13.68	0.13	4.22	26.69	2.47	6.37	13.75	11.06

Note: SD- Standard Deviation

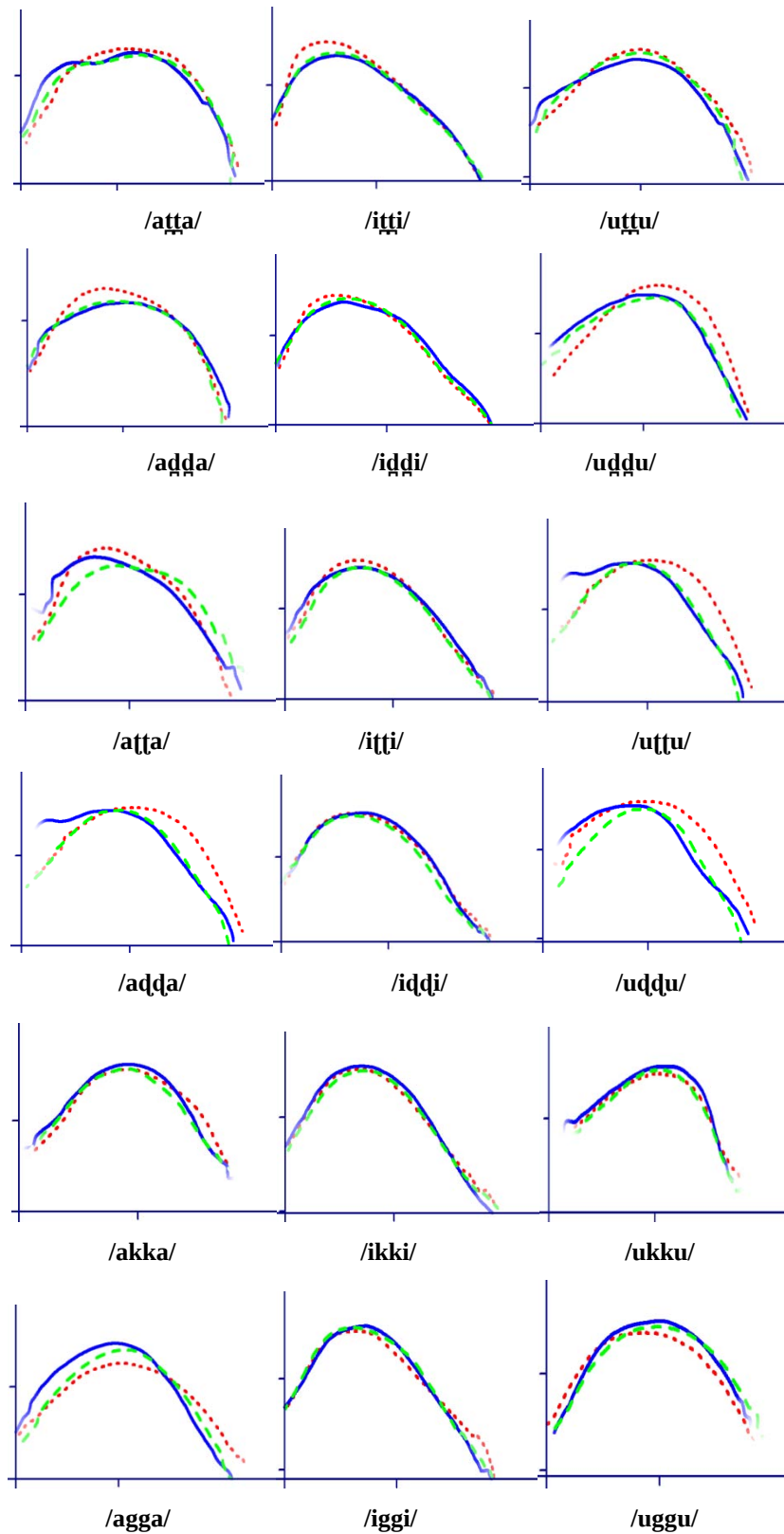


Figure 4. Averaged tongue contours of preceding vowel (red dotted line), consonant (blue filled line) and following vowel (green dashed line) of 30 subjects for all 18 tokens

Further, the Friedman test was adopted to inspect the null hypothesis of CRC across consonants. Results showed that there were significant differences among consonants in each vowel pair category including /a/ and /i/ [χ^2 (5) = 48.095, $p < .001$], /a/ and /u/ [χ^2 (5) = 14.267, $p = .014$] and /i/ and /u/ [χ^2 (5) = 33.657, $p < .001$]. In addition, pairwise comparisons were made using the Wilcoxon signed ranks test within each vowel category (Table 3). Interestingly, coarticulation resistance of retroflexes was significantly higher than dentals and velars in the vowel pair of /a/ and /i/ with the effect size range 0.47 to 0.84. Within the same context, /k/ had significantly higher CRC than /g/ and lesser CRC than /ḡ/.

In the context of /a/ and /u/, the voiceless dental consonant /t̪/ had significantly less CRC than retroflexes and velars, whereas the voiced dental consonant was significantly different from unvoiced retroflex and unvoiced velars. Retroflexes were significantly different from velars and voiced dental consonants, having high CRC when adjacent to /i/ and /u/. Also, dentals had significantly higher CRC than /k/. The effect size was .36 to .48 for /a/-/u/ and .44 to .77 for the /i/-/u/ context. In conclusion, retroflexes had higher CRC than other consonants in all the three vowel pairs considered. Other consonants did not show constant trend across conditions.

Table 3. Pair wise comparison of Coarticulation Resistance of Consonants (CRC) within three pairs of vowels

Tokens	a & i		a & u		i & u	
	Z	P	Z	p	Z	p
CRC(t̪) vs	1	.06	0	.7	1	.0
CRC(d̪)	.861	3	.319	50	.779	75
CRC(t̪) vs	4	.00↑	2	.0↑	0	.3
CRC(t̪)	.309	0***	.643	08**	.854	93
CRC(t̪) vs	4	.00↑	2	.0↑	1	.1
CRC(d̪)	.062	0***	.520	12*	.368	71
CRC(t̪) vs	1	.08	2	.0↑	3	.0 ↓
CRC(k)	.717	6	.396	17*	.322	01***
CRC(t̪) vs	0	.47	2	.0↑	1	.0
CRC(g)	.710	8	.005	45*	.923	54
CRC(d̪) vs	3	.00↑	2	.0↑	2	.0↑
CRC(t̪)	.240	1***	.561	10**	.396	17*
CRC(d̪) vs	3	.00↑	1	.0	2	.0↑
CRC(d̪)	.075	2**	.923	54	.972	03**

CRC(ḍ) vs	3	.00↓	2	.0↑	2	.0↓
CRC(k)	.342	1***	.232	26*	.746	06**
CRC(ḍ) vs	0	.55	1	.1	1	.2
CRC(g)	.586	8	.491	36	.203	29
CRC(t) vs	0	.81	0	.4	0	.7
CRC(ḍ)	.237	3	.833	05	.257	97
CRC(t) vs	4	.00↓	0	.9	4	.0 ↓
CRC(k)	.576	0***	.072	43	.042	00***
CRC(t) vs	3	.00↓	1	.2	2	.0↓
CRC(g)	.137	2**	.039	99	.725	06**
CRC(ḍ) vs	4	.00↓	0	.4	4	.0 ↓
CRC(k)	.494	0***	.730	65	.206	00***
CRC(ḍ) vs	2	.00↓	0	.6	2	.0↓
CRC(g)	.952	3**	.483	29	.972	03**
CRC(k) vs	2	.01↓	0	.5	1	.0
CRC(g)	.581	0**	.668	04	.656	98

Note: * = $p \leq 0.05$, ** = $p \leq 0.01$, *** = $p \leq 0.001$. Upward arrow () shows higher CRC for the second consonant context. Conversely, downward arrow (↓) shows least mean CRC for the second consonant context.

Comparison of Coarticulation Resistance of Consonants (CRC) across voicing counterparts

The effect of voicing on CRC was investigated using the Wilcoxon signed ranks test (Table 3). The results showed that the voiceless velar consonant was significantly different from the voiced counterpart only in the context of the vowels /a/ and /i/. Mean CRC was high for /k/ than /g/.

Discussion

The results of the present study revealed that there was a significant difference of coarticulation effect of retroflexes in the context of /aCa/, /iCi/; /iCi/, /uCu/ and /aCa/, /uCu/ respectively. Švarný and Zvelebil (1955) reported that during the production of retroflexes, the degree of retroflexion is more apical with higher angles of retroflexion in Hindi. On the other hand, in Kannada, the angle between the slope of the surface of the anterior tongue body and the tongue blade is reduced for voiceless retroflexes (Sindusha, Irfana & Sreedevi, 2013). In the present study, though Hindi has a weak constriction against palate, the coarticulation pattern was similar to Kannada (Kochetov & Sreedevi, 2013; Kochetov et al.

2014; Kochetov & Sreedevi, 2015).

Similarly, velar consonants more strongly resisted the influence of adjacent vowels than did dental consonants occurring in /iCi/ and /uCu/ contexts. This can be attributed to the presence of a wider tongue dorsum contact area during the production of velars. The tongue dorsum constriction is very minimal in dental consonants, as only the tip of tongue, rather than the entire tongue dorsum, touches the teeth to make an obstruction.

To correlate present results to existing speech production models, the DAC model (Recasens et al, 1997) explains that the degree of coarticulation should vary with the constraints exerted upon the kinematics of the different tongue constrictions. Thus, among the place categories, retroflex consonants in particular impose restrictions upon tongue activity to prevent the V-to-V coarticulation. From this study, it is evident that coarticulation resistance decreases progressively from retroflex to velar and dental. The production of retroflexes occurs as a tongue tip constriction along with forward movement of tongue dorsum rather than a tongue dorsum constriction as discussed in the DAC model. In a retroflex, the degree of constriction is effective, as the tongue tip constriction must be more precise to make an accurate angle of retroflexion. Hence, this specific articulatory dynamic opposes the influence of other adjacent segments. Similarly, greater coarticulation resistance of velars than dentals provides a reason to believe the notion of tongue dorsum constriction against palate. This suggests that the coarticulation resistance scale is a valid criterion for consonant classification and also provides valuable information on spatio-temporal planning mechanisms underlying speech production.

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L2 English Rhythm by Vietnamese Speakers: A Rhythm Metric Study

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Abstract

This paper reports a study that investigated the development of speech rhythm in L2 as a function of acquisition progress in L2 spoken by learners with a native language that is rhythmically contrastive to the target language. Ten native/L1 Australian English speakers, 20 Vietnamese speakers of English (10 beginners and 10 advanced speakers) and a control group of four native Vietnamese speakers were included. The rhythm metrics were obtained from a set of 10 English sentences and 20 Vietnamese utterances. The statistical results showed that the variation in duration of vowel and consonant intervals in the L2 is higher in advanced proficiency levels and lower in beginner levels. This, on the one hand, indicates that beginners may transfer their L1 rhythmic pattern onto English; on the other hand, it suggests that rhythm in L2 English develops from more syllable-timed towards more stressed-timed patterns as acquisition progresses, consistent with Ordin and Polyanskaya (2015).

Keywords

Rhythm, Vietnamese, English, Second Language Acquisition, L2 prosody, L2 proficiency

Research indicates that the prosodic pattern of the first language, particularly the rhythmic pattern, is one of the earliest aspects of speech that infants acquire and remains unaffected by second language input until a later stage of L2 acquisition (Abercrombie, 1967; Ioup & Tansomboon, 1987; Juseczyk et al., 1993). While there is increasing evidence that some prosodic aspects of speech are already acquired in the womb (Moon, Lagercrantz, &

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Kuhl, 2013; Mehler et al., 1988; Nazzi, Bertoncini, & Mehler, 1998; Fifer & Moon 1988) and that essentially an adult model of prosodic features can be manifested already at the period of babbling and first words (Vilman, DePaolista, Nakai, Evans & Kunnai, 1999; Allen & Hawkins, 1978; Clumeck, 1980; Li & Thompson, 1977; Halle, Boysson-Bardies & Vihman, 1991; Juseczyk, 1993), prosodic features in L2 have been shown to be the most time-consuming and hardest for adults to acquire due to interference from the L1 and, especially, the age factor (Huang & Jun, 2011; Rasier & Hiligsmann, 2007; James, 1987; Schmidt, 1986). These results have been found to extend to languages whose prosodic systems are quite different from English (Huang & Jun, 2011). This paper reports a study that aimed to investigate the development of speech rhythm in L2 as a function of acquisition progress in L2 spoken by learners with a native language that is rhythmically contrastive to the target language. Specifically, the study examined beginner and advanced adult Vietnamese learners' acquisition of English rhythmic patterns. In this study, speech rhythm was defined as durational variability that can be captured by interval-based rhythm metrics (Ordin & Polyanskaya, 2015). While English is considered a prototypical stress-timed language (Pike, 1945; Abercrombie, 1967), Vietnamese is claimed to cluster with syllable-timed languages (Romano, Mairano & Calabrò, 2011; Sawanakunanon, 2013).

Research that focuses on acquisition of speech rhythm in L2 is still rare. Most of these studies focus on comparing rhythm in L2 speech with the target represented by an adult native speaker. The L2 speech investigated is usually produced by rather advanced learners. White and Mattys' (2007) results showed that the rhythm scores in L2 speech are intermediate between those in the native and the target language of the learners. This is usually interpreted as the influence of the native language of the learner on his speech production in the L2. Low, Grabe and Nolan (2000) showed that nPVI-V (vocalic normalized Pairwise Variability Index) in L2 Singaporean English is influenced by the L1 Chinese language. In studies by White and Mattys (2007), Gut (2009) and Mok (2013), rhythm in L2 English was shown to be affected by L1 Chinese, French, Spanish, Romanian and Italian.

The studies that have focused on the development of rhythmic patterns in the course of L2 acquisition are even more limited in scope. One of these is the study by Ordin and Polyanskaya (2014) who compared how speech rhythm develops in L1 and in L2 acquisition. They found that speech rhythm develops from more syllable-timed toward more stress-timed patterns both in child L1 and in adult L2 speech. These researchers showed that both vocalic and consonantal variability in duration in L2 English increases as a function of the length of

residence in the UK in adult speech when the target (English) and the native (Italian or Punjabi) languages of the learners are rhythmically contrastive. In another study, Ordin, Polyanskaya and Ulbrich (2011) showed that durational variability in the speech of L2 learners also increases with proficiency when the target (English) and the native (German) languages of the learners exhibit similar rhythmic properties. English and German share phonological parameters that are known to affect the rhythm metrics. Both of these languages are classified as stress-timed in terms of phonetic timing patterns captured by metric scores (Grabe & Low, 2002) and exhibit the phonological characteristics typical of stress-timed languages (Dauer, 1987; Schiering, 2007). Therefore, German learners of English do not have to acquire phonological characteristics like production of complex syllables and complex consonantal clusters, opposition of long and short vowels, etc. Li and Post (2014) studied rhythmic patterns in L2 English produced by German and Mandarin learners at either intermediate or advanced stages. Their results indicated that both German and Chinese learners at the intermediate level produced speech with a lower degree of durational variability compared to advanced learners. They also found that learners of English with rhythmically contrastive L1 languages followed comparable developmental paths in the acquisition of durational variability of vowel intervals, moving towards a higher degree of stress-timing with increased proficiency.

Ordin and Polyanskaya (2015) used rhythm metrics (the specifics of which will be laid out in the Rhythm Metrics section) to examine the differences in durational variability between proficiency levels in L2 English spoken by French and German learners. Their results reveal that durational variability increased as L2 acquisition progressed in both groups of learners. This indicates that speech rhythm in L2 English develops from more syllable-timed towards more stress-timed patterns irrespective of whether the native language of the learner is rhythmically similar to or different from the target language. Even though both groups showed similar development of speech rhythm in L2 acquisition, there were also variations: German learners achieved a degree of durational variability typical of the target language, while French learners exhibited lower variability than native British speakers, even at an advanced proficiency level. As a result of these studies, Ordin and Polyanskaya (2015) concluded that regardless of whether the native language and the target language are rhythmically similar or different, learners will first go through a phase of syllable-timed rhythm before developing the rhythmic patterns of the target language; the variation in

duration of consonant, vowel and syllable intervals will increase with proficiency as acquisition progresses.

Rhythm metrics

Spoken languages are traditionally classified according to their rhythmic properties as stress-timed, syllable-timed or mora-timed (Pike, 1945; Abercrombie, 1967, among others). In stress-timed languages, such as English, Russian and Arabic, the stresses recur at approximately equal time intervals. In syllable-timed languages, such as French, Spanish, and Yoruba, or mora-timed languages, such as Japanese and Tamil, it is claimed that syllables or moras tend toward equal durations. A substantial amount of research has been carried out to examine the physical reality of the isochrony theory on syllable- and stress-timed languages. In the 1980s and 1990s, many acoustic studies (Roach, 1982; Dauer, 1983; Laver, 1994; among others) were conducted to examine the isochrony hypothesis and disproved it: inter-stress intervals did not have equal length nor did syllables have stable duration. Furthermore, not much difference was found in syllable duration between the two types of languages (Roach, 1982; Dauer, 1983; Laver, 1994; among others). In spite of unsuccessful attempts to find isochrony in any of the timing dimensions of speech rhythm as a linguistic structure—or to support the claim that languages are divided into rhythmic classes based on periodicity (Roach, 1982; Pammies Bertran, 1999; Dauer, 1983)—empirical results confirm the psychological reality of speech rhythm. Adults and babies can discriminate unfamiliar languages with contrastive rhythms but cannot distinguish between the timing patterns of rhythmically similar languages (Ramus, Nespor, & Mehler, 1999; Ramus & Mehler, 1999). It is argued by Dauer (1983) that stress-timing or syllable-timing is not an absolute, but rather a gradient feature, allowing languages to be described as more or less stress-based. Furthermore, Dauer stated that rhythmic diversity results from a combination of phonological, phonetic, lexical and syntactic features, where syllable structure, vowel reduction and word stress are of prime importance. Roach (1982) states that languages labelled as stress-timed allow complex consonant clusters, leading to higher variation of consonant clusters as well as vowel reduction, leading to higher variation of vocalic intervals. From these insights, a number of acoustic metrics have been proposed for the comparison of rhythm between and within languages (see White & Mattys, 2007a, 2007b for a review of these metrics).

More recently, several studies report that the auditory impression of rhythm has an acoustic basis: variability in intervals smaller than the syllable, that is, vocalic and inter-

vocalic ones. The results of these studies showed that stress timed languages exhibit greater vocalic and inter-vocalic duration variability than syllable timed ones (Deterding, 1994; Low & Grabe, 1995; Ramus et al., 1999; Low et al., 2000; Grabe & Low, 2002; among others). These new studies also recognized the existence of languages that exhibit mixed rhythmic characteristics, which identify the need for a more fine-grained rhythm classification.

In spite of the criticism the rhythm metrics have recently received (e.g., Arvaniti, 2012), they still remain widely applied in linguistic research and, so long as the methodological considerations are accounted for, yield valuable insight into cross-linguistic rhythmic differences as well as into the differences in rhythmic patterns between L1 and L2 speech (Gabriel & Kireva, 2014). Moreover, rhythm metrics have also been used to investigate acquisition processes in speech rhythm development. In this study, seven popular rhythm metrics were used: first, the %V, DV, and DC following Ramus et al. (1999); second, VarcoC and VarcoV following Dellwo (2006) and Ferragne and Pellegrino (2004); and third, the nPVI-V and rPVI-V following Grabe and Low (2002). The rhythmic metric formulas are as follows:

- %V: the proportion of vocalic intervals within the sentence (that is, the sum of the total duration of the vowels in the sentence divided by the total duration of the sentence).
- DV: the standard deviation of the duration of vocalic intervals within each sentence.
- DC: the standard deviation of the duration of consonantal intervals within each sentence.
- VarcoV: standard deviation of vocalic interval duration divided by mean vocalic duration (and multiplied by 100).
- VarcoC: standard deviation of consonantal interval duration divided by mean consonantal duration (and multiplied by 100).
- rPVI-V, or non-normalized Pairwise Variability Index: the mean of the duration differences between successive intervals (Vs)
- nPVI-V, or vocalic normalized Pairwise Variability Index: the mean of the duration differences between successive intervals (Vs) divided by the sum of the same intervals.

Vietnamese language rhythm

Vietnamese is a contour tone language that has no system of culminative word stress (Nguyễn, Ingram & Pensalfini, 2008; Nguyễn & Ingram, 2007a); nevertheless, it is widely accepted that there is stress in the sense of accentual prominence at the phrasal level (Thompson, 1965; Nguyễn, 1970; among others). It has been observed that duration, intensity, and full tonal realisation of accented syllables are important parameters for

describing stress in Vietnamese (Đỗ, 1986; Chaudhary, 1983; Hoàng & Hoàng, 1975; Gsell, 1980).

In terms of phrasal prominence, Thompson (1965) stated that Vietnamese has three degrees of stress, but in practice, this seems to be no more than an impressionistic attempt, and Thompson did not explain what the acoustic correlates of these “stresses” would be. In regard to the stress patterning in utterances, it is generally claimed by some researchers that there is an alternating pattern of strong and weak syllables. Thompson (1965) stated that “each pause group has at least one heavy stress and weak stresses are fairly frequent in rapid passages, rarer in careful speech” (p. 50). Jones and Huỳnh (1960) claimed that “normally, the stresses in a Vietnamese utterance are conditioned by the junctures,” and considered the fundamental stress pattern of Vietnamese as consisting of the alternating occurrence of a strong and weak stress, with the last word of the phrase receiving a strong stress. In line with Jones and Huỳnh’s observations, Cao (2003) remarked that due to the demarcative function of stress/accent in Vietnamese, native listeners tended to hear a juncture after a stressed syllable even though there is no such pause in reality, as assessed using spectrograms. Nevertheless, these previous studies are generally based on auditory impressions without empirical evidence by instrumental study. In a recent study, Nguyễn (2010) investigated the rhythmic patterns in Vietnamese polysyllabic words by examining the rhythmic patterns and their acoustic correlates in polysyllabic reduplicative words (2-, 3-, 4-, 5-, 6- syllable pseudo-words). The results showed that there is a tendency for syllable coupling, as indicated mainly by a syllable duration pattern and supported by the native listeners’ perception results, suggesting that polysyllabic words in Vietnamese tend to be parsed into bi-syllabic iambic feet with a rightward or retrograde rhythmic pattern. This result is further supported by data on the rhythmic structure of Vietnamese folk poetry (Nguyễn, 2013) and narrative prose speech (Nguyễn, 2014), which shows an iambic pattern of acoustic prominence of bisyllabic and trisyllabic words/phrases.

The status of vowel reduction in Vietnamese has not received much attention in empirical research. Only the segmental reduction of unstressed syllables has been found in Nguyễn and Ingram (2007a, b) and Phạm (2008). Nguyễn and Ingram (2007a) examined vowel formants of disyllabic compounds versus phrases and found that vowels under an accented condition tend to be more peripheral than those under a normal unaccented condition. Additionally, their results showed that in reversible coordinative compounds (e.g., in bàn ghế ‘tables and chairs’ vs. ghế bàn ‘chairs and tables’), the vowels in the second

syllable have longer duration and are more peripheral than their first position counterparts. Nguyễn and Ingram (2007b) investigated vowel formants of disyllabic reduplications (e.g., sáng sáng ‘bright bright’). They found that the vowel of the reduplicated syllable (the first syllable) tended to be more centralised than that of the base syllable (the second syllable). Phạm (2008) found that Vietnamese function words are typically cliticized (phonetically reduced) and appended to prosodic words. In a recent study, Nguyễn (2015) investigated vowel reduction in conversational speech in Vietnamese. The results showed that vowels in accented conditions have longer duration and are more peripheral than those in unaccented counterparts, vowels of the first syllables of disyllabic words are more reduced compared to those in second syllables, and vowels are more reduced in monosyllabic function words than in content words. Generally, the study shows that vowel reduction is more pervasive in spontaneous Vietnamese than previously documented.

Regarding syllable duration, Brunelle, Chow and Nguyễn (2015) looked at the effect of lexical frequency, lexical categories and phrase boundaries on syllable duration in Vietnamese. Their results show that high frequency words tend to be shorter, that function words are independently shorter than lexical words, and that Vietnamese has pre-boundary lengthening.

Sawanakunanon (2013)’s study analyzed segment timing in Mon, Khmer, and Vietnamese. The speech data were segmented into vocalic, consonantal, voiced, and unvoiced intervals. The results showed that Vietnamese, a tonal language in which some tones co-occur with phonation, has the lowest variation of vocalic durations. In another recent study using the nPVI measurement to study the rhythm of East Asian languages, Romano, Mairano and Calabrò, (2011) found that Mandarin Chinese and Vietnamese samples cluster with Spanish, Italian, French and Greek, which are supposedly syllable-timed languages.

In brief, Vietnamese and English represent two broadly contrastive prosodic types: tone languages and stress languages. English has a system of culminative word stress and a stress-timing rhythm (Pike, 1945; Abercrombie, 1967), but Vietnamese, a tonal language, has no system of word stress; rather, it has a system of lexically distinctive contour tones. Therefore, this study will be an original contribution to the field because it investigated the rhythmic difference between two typologically distinct languages.

Vietnamese acquisition of English prosody

There has not been much research focused on Vietnamese speakers’ acquisition of English prosody. Nguyễn and Ingram (2005) examined the transfer of tonal acoustic correlates in

Vietnamese learners' production of English word stress. More specifically, the study examined acoustic features that native and non-native speakers (Vietnamese learners of English) use to differentiate stressed from unstressed syllables in noun-verb pairs (as in the words REcord vs. reCORD). The results indicated that Vietnamese learners of English (both proficiencies) utilised fundamental frequency (F0) and intensity correlates similarly to native speakers. A major difference was the lack of vowel and syllable duration cues in the beginning learners' production. In another study on prosodic transfer effects in the production and perception of three English stress patterns (broad-focus noun phrase, narrow-focus noun phrase and compound) at the level of word and phrase prosody by Vietnamese learners of English, Nguyễn, Ingram and Pensalfini (2008) found that Vietnamese speakers had no problem in manipulating contrastive levels of F0 and intensity on accent-bearing syllables; however, they failed to realize the timing contrast between compound words and phrases and the syntagmatic contrast of accent in larger units (such as polysyllabic words or phrases), as evidenced by their failure to deaccent the second element of the compound and narrow-focus patterns. Nevertheless, the advanced speakers' ability to compress the constituents of the compounds and to deaccent the final nouns shows the effect of language learning/experience on prosodic acquisition. At the connected speech level, Nguyễn and Ingram (2004) found that the transfer of many segmental, prosodic, timing and syllable structures from the Vietnamese phonological system such as checked stops, implosive stops, vowel quality, suppression of vowel reduction and checked tones was also evidenced in advanced Vietnamese speakers of English. Particularly, the suppression of vowel reduction in unstressed syllables and the lengthening of many unstressed vowels/function words were projected under sustained high tones in unstressed syllables in spite of an advanced level of English proficiency.

Prediction

Among the seven rhythmic metrics used in this study, it was predicted that native English speakers and advanced Vietnamese learners of English would have lower %V than beginners; in contrast, the DV and DC values would be higher in English speakers and advanced learners because they may reduce vowels more. The VarcoC and VarccoV values were expected to be higher for English speakers and advanced learners, showing higher vowel and consonant variability in English speech data. Similarly, it was also expected that the nPVI-V and rPVI-V would be higher in English speakers and advanced learners, indicating a greater variability between successive vowel duration in English.

Method

Participants

In order to investigate the development of speech rhythm in L2 as a function of acquisition progress in L2 spoken by learners with a native language that is rhythmically contrastive to the target language, the researcher recorded 10 native Australian English speakers (5 females and 5 males) as a control group and 20 Vietnamese speakers of English (10 beginners and 10 advanced speakers). A control group of 4 native Vietnamese speakers was also included. The 10 native Australian English speakers were first year linguistics students at the University of Queensland and in the age range 24-48. The 10 advanced Vietnamese speakers of English were full-time overseas students at the University of Queensland. Vietnamese was their native language. They were between the ages of 23-41 and ranged in residency in Australia from a period of 0.5-6 years (mean: 1.4). All had attained written and spoken English proficiency scores (IELTS) of 6.5 to gain admission to the University of Queensland. They all had been EFL teachers or lecturers in teacher training programs at universities in Vietnam and were doing an MA in TESOL studies. Their English proficiency can be said to be advanced or high level. The 10 beginners were overseas high school students who were ages 15-18 and had resided in Australia for a period of 0.5-1 year. The beginners had all started learning English at the age of 12 (in secondary school) with the grammar translation method, which focuses on vocabulary and grammar learning. However, they were exposed to communicative English learning for some time at foreign language centres in Vietnam and English classes in Australia before entering high school. Their English proficiency can be said to be at a low level.

Linguistic materials

Ten English test sentences were selected from a set of 23 sentences that incorporated vocabulary items from a picture-naming pronunciation test originally designed to elicit segmental transfer errors of pronunciation by Vietnamese speakers of English (Ingram & Pittam, 1987) and were used in Nguyễn and Ingram (2004, 2016). The set of sentences were elicited via a grammatical paraphrase task. The grammatical paraphrase task required participants to transform a sentence, presented in spoken and written form (over headphones and a computer screen) into a meaning-equivalent form. The materials were presented via a spoken Language Assessment Program (<http://www.language-map.com>). Participants typed in the paraphrase in response to an initial prompt word and when satisfied with their

construction, read out the sentence that they had formed. The linguistic aspects of task were sufficiently complex to engage the participants and to deflect their attention from the pronunciation aspects of the task. This yielded quite natural sounding, careful but unguarded speech. After speaking their paraphrase response into a headset microphone, the participants pressed a button for presentation of the next item in the set, randomly selected without replacement until all items had been presented. Both the control native Australian English speakers [n=10] and two groups of Vietnamese speakers of English (beginners [n=10] and advanced [n=10]) performed this task.

The 20 Vietnamese sentences used for the four control Vietnamese speakers were taken from the excerpts of a short story (namely *Tôi đi học* by Thanh Tịnh) which was used in Nguyễn (2014). The 10 English test sentences and 20 Vietnamese utterances are presented in Appendix 1 and 2 respectively.

Segmentation and analysis

In order to calculate the rhythmic metrics of the speech corpus, the researcher marked the boundaries of vowel and consonantal intervals in Praat (Boersma & Weenink, 2009) while viewing a waveform and wide-band spectrogram with a 5 ms window and a frequency resolution of 86 Hz and using interactive playback. The boundaries of vowels were marked using vowel onset and offset criteria from Peterson and Lehiste (1960), supplementing their guidelines when placing difficult boundaries for /l/, /r/, /w/, /j/, and /h/ by using perceptual cues in combination with rapid changes in formants or energy visible on the spectrogram. In addition, syllabic consonants were treated as vowels as in Ferragne and Pellegrino (2004). Utterance-final syllables were excluded to avoid lengthening effects. Then, the seven rhythm metric measurements were taken using Correlatore, a program specifically developed for computing rhythm metrics (for details, see www.lfsag.unito.it/correlatore/index_en.html).

In order to account for the effect of speakers' differences and the intrinsic segmental and tonal effects, a restricted maximum likelihood (REML) applied to a mixed-effect ANOVA model methodology was performed on the rhythmic metric values of the speech corpuses. The dependant variable was a rhythmic metric (%V, DC, DV, VarcoC, VarcoV, nPVI-V or rPVI-V). The fixed effect was speaker group (native English speakers, beginners and advanced Vietnamese speakers of English and native Vietnamese speakers). The random effects were speakers (34 speakers) and sentences (380 utterances). A Tukey post-hoc test was then conducted to determine the significant differences among the levels of the main effects. The use of REML overcomes the potentially serious deficiency of the ANOVA-based

methods which assumed that data are sampled from a random population and normally distributed. REML also avoids bias arising from maximum likelihood estimators in which all fixed effects are known without errors, consequently tends to downwardly bias estimates of variance components. Moreover, REML can handle unbalanced data. The data analysis was carried out using the SPSS (version 20) program.

Results

The results of the ANOVAs on the rhythm metrics for the speech corpus are summarised and presented in Table 1. First, as predicted, L1 English speakers had significantly lower %V than L1 Vietnamese and L2 English groups; in particular, there was no significant difference between the advanced and L1 English groups ($p=0.9$), suggesting that the advanced group reduced vowels to the same extent as native English speakers.

By contrast, the DC values were higher in L1 English and L2 advanced groups, indicating that they reduced vowels more and produced more complex syllable structures than L1 Vietnamese and L2 beginner groups, while there was no significant difference between the four groups on DV values.

The VarcoV values were also found to be significantly higher for L1 English and L2 advanced groups, showing higher vowel variability in the L1 English group than in the Vietnamese control group ($p<0.006$) and that the advanced group produced English vowel variability to the same extent as native English speakers ($p=0.78$). In addition, the beginner group had an insignificant difference in VarcoV values from the L1 Vietnamese control group ($p=0.44$), suggesting that their L2 English rhythm was comparable to that of their L1 Vietnamese. In other words, they may have transferred their L1 Vietnamese rhythm patterns to English. In contrast, there was no significant effect for VarcoC values ($p=0.11$).

The rPVI-V and nPVI-V values were significantly higher in L1 English ($p<0.02$), indicating a greater variability between successive vowel duration in English than in Vietnamese, suggesting that English has more reduced vowels than Vietnamese. In other words, English has more vowel duration contrast between stressed and unstressed vowels and between long and short vowels. Furthermore, the mean nPVI-V and rPVI-V values of the L2 advanced group were also comparable to that of L1 English group ($p=0.73$ and 0.19 respectively), indicating that the advanced group consistently exhibited greater variability between successive vowel duration to the same extent as native English speakers.

Table 1. The ANOVA results and mean values of the rhythm metrics for L1 English, L1 Vietnamese and L2 English speech

Metrics	F values	Mean				Significance Levels					
		Native English	Advance	Beginner	Native Vietnamese	English-Advance	English-Beginner	Advance-Beginner	Vietnamese-English	Vietnamese-Advanced	Vietnamese-Beginner
V%	F(3, 45)= 306, p<0.001	43	43	51	57	0.9	0	0	0	0	0
DC	F(3, 36)= 3.2, p=0.03	71	78	73	60	0.09	0.6	0.3	0.089	0.006	0.039
DV	F(3, 43)= 3.0, p=0.038	59	71	73	78	0.009	0.086	0.79	0.021	0.36	0.51
varcoC	F(3, 36)= 2.1, p=0.11	54	50	48	51	0.071	0.047	0.42	0.45	0.63	0.2
varcoV	F(3, 42)= 4.5, p=0.008	57	57	44	47	0.78	0.005	0.006	0.011	0.015	0.44
nPVI-V	F(3, 38)= 2.3, p=0.04	57	56	44	50	0.73	0.002	0.003	0.92	0.42	0.04
rPVI-V	F(3, 40)= 3.6 p=0.035	73	83	78	68	0.019	0.095	0.81	0.48	0.05	0.17

Among the seven rhythmic metrics used in this study, as shown in Figure 1, a combination of VarcoV and nPVI-V is shown to be the most useful in discriminating between the four speaker groups. Particularly, the advanced and beginner L2 speakers of English were well distinguished from each other. The advanced speakers were shown to merge with the L1/native control English speakers. In contrast, the beginners clustered with L1/native control Vietnamese speakers. This suggests that vowel-related metrics are better indicators for rhythm deviation, particularly to classify the L2 English rhythm produced by Vietnamese speakers as being more syllable-timed than stress-timed at the beginning stage of language learning.

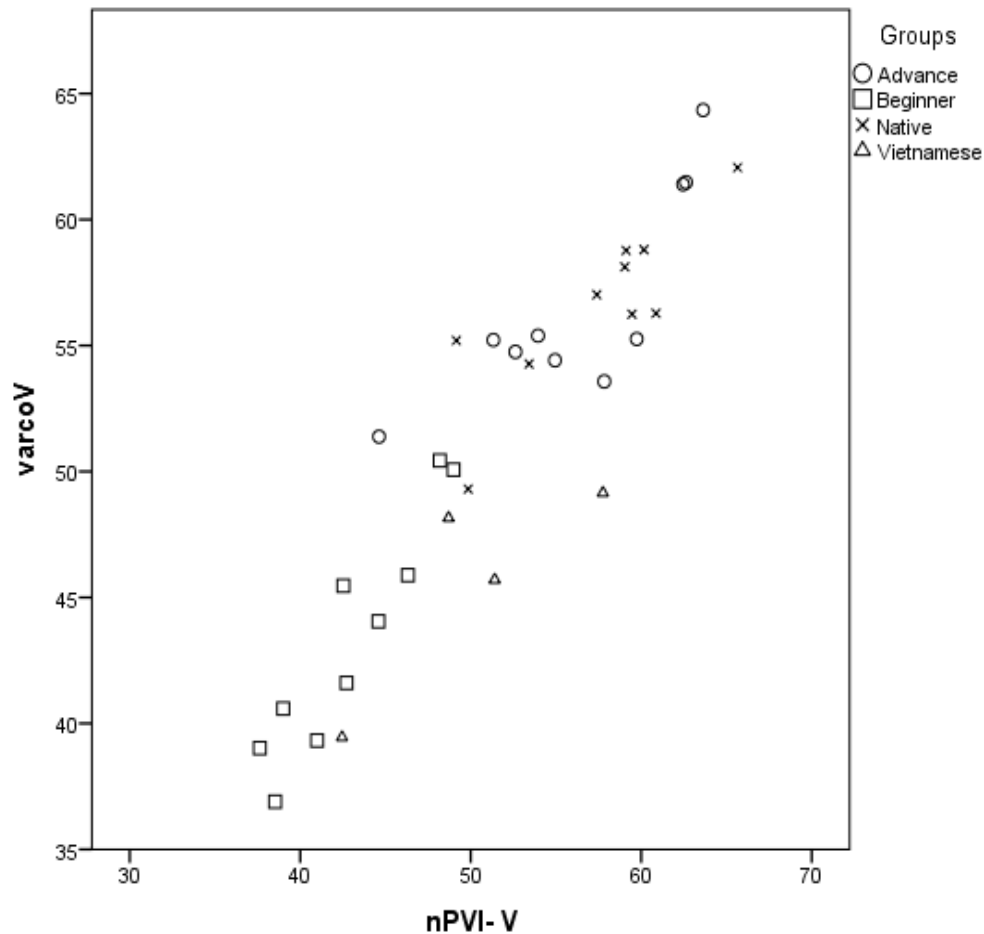


Figure 1. Distribution of four speaker groups over the varcoV and nPVI-V plane. Circle: Advanced speakers of English [n=10], square: Beginners [n=10], Cross: native/L1 English speakers [n=10], Triangle: native/L1 Vietnamese speakers [n=4].

Discussion

First, the statistical results show that all seven of the rhythm measures of the advanced speakers (%V, DC, DV, VarcoC, VarcoV, nPVI-V and rPVI-V) tend to converge with that of the L1/native English speakers while most of the beginners' measures (DC, DV, VarcoC, VarcoV, and rPVI-V) come together with those of the L1/native Vietnamese speakers. In other words, the variation in duration of vowel and consonant intervals in the L2 is higher on advanced proficiency levels and lower in beginner levels. This, on the one hand, indicates that beginners may transfer their L1 rhythmic pattern into English; on the other hand, this suggests that rhythm in L2 English develops from more syllable-timed towards more stressed-timed patterns as acquisition progresses, consistent with Ordin and Polyanskaya (2014, 2015).

Second, the rhythmic metrics (specifically %V, DC, DV, VarcoV, and rPVI-V) discriminate well between the two languages: English, as a stressed-timed language, has more complex syllable structures and more reduced vowels, as well as a higher variability of vowel and consonantal intervals than Vietnamese, which has less vowel reduction and lower variation of vocalic and consonantal durations. Even though Vietnamese also has vowel/syllable duration asymmetry (Nguyễn & Ingram, 2007a, 2007b; Phạm, 2008; Nguyễn, 2014; Nguyễn, 2015; Brunelle, Chow & Nguyễn, 2015), the extent of vowel and consonantal duration contrasts is shown to be smaller in Vietnamese than in English. This is consistent with Sawanakunanon (2013) and, Romano et al. (2011) who found Vietnamese to cluster with supposedly syllable-timed languages.

Third, the lesser variation in duration of vowel intervals in the L2 English of the beginner group indicates the suppression of vowel reduction in unstressed syllables and the lengthening of many unstressed vowels/function words, consistent with the results found in previous studies of Vietnamese acquisition of English prosody (Nguyễn & Ingram, 2004, 2005; Nguyễn et al., 2008). This supports the transfer of L1 rhythmic pattern into L2 English, consistent with Low et al. (2000), White and Mattys (2007), Gut (2009) and Mok (2013).

Fourth, the advanced group consistently exhibiting greater variability between successive vowel duration to the same extent as native English speakers shows the effect of language learning/experience on rhythmic pattern acquisition, lending further support for the L2 prosody acquisition in previous studies (Nguyễn & Ingram, 2005; Trofimovich & Baker, 2006; Nguyễn et al., 2008).

Finally, the syllable-timed to stressed-timed acquisition process as shown in the data of this study suggests that speech rhythm development is guided by universal principles, from easier-to-acquire syllable-timed patterns towards more marked stress-timed patterns (Ordin & Polyanskaya, 2015). This is also indirectly in line with the evidence from rhythm development in child speech (Ordin & Polyanskaya, 2014; Payne et al., 2012; Grabe et al., 1999).

Conclusion

This paper reports a study that investigated the development of speech rhythm in L2 as a function of acquisition progress by learners with a native language that is rhythmically contrastive to the target language. The statistical results showed that the variation in duration of vowel and consonant intervals in the L2 is higher on advanced proficiency levels and lower in beginner levels. This result, on the one hand, indicates that beginners may transfer their L1 rhythmic pattern into English; on the other hand, this suggests that rhythm in L2 English develops from more syllable-timed towards more stressed-timed patterns as acquisition progresses, consistent with Ordin and Polyanskaya (2015).

Rhythm metrics have been criticized when being used for measuring timing and classifying different languages (Arvaniti, 2012). The matter of concern is the comparison of rhythm metrics of different linguistic materials in different languages which have distinct phonological, phonetic, lexical and syntactic features. In contrast, in this study, the same linguistic material (10 English sentences) was used to compare the three speaker groups (control L1 English speakers, beginners and advanced L2 learners of English). The only difference is the L1 control Vietnamese narrative data. In this study, the rhythm metrics have been shown to discriminate well between English and Vietnamese languages and between the advanced and beginners' proficiency levels. Particularly, a combination of VarcoV and nPVI-V is shown to be the most useful in discriminating between the four speaker groups. This is consistent with Low et al. (2000), Grabe and Low (2002), Dellwo and Wagner (2003), and White and Mattys (2007) who showed that the speech-rate normalised metrics %V, VarcoV and nPVI-V could discriminate the stressed-timed and syllable-timed languages.

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Appendix 1. English Sentences

1. What Kim wanted was a box of chocolate, not a bunch of flowers
2. To carry all those books he needed a strong box
3. They wanted to migrate to a friendly society
4. They hung bluebells on the eaves of the greenhouse
5. John stumbled on the blackboard because it was dark
6. John couldn't see the blackboard without his glasses
7. It was the plate who ran away with the spoon
8. In the greenhouse the bluebells and the tulips were thriving
9. Bill invested his life savings in a friendly society
10. As they came across the bridge, dark clouds were gathering

Appendix 2. Instruction for the Paraphrase Task

Instructions

Each item will be introduced by a * which will appear in the middle of screen.

A short time later, a test sentence will appear in its place.

Under the sentence will be a prompt word or phrase follow by a box:

I often watch television.

Often ... [.....]

In the box you should type:

Often [**I watch television**].

You should then **read aloud** the sentence that you have just typed.

Read the whole sentence (including the prompt word) out loud in a strong natural voice.

Appendix 3. Vietnamese Sentences

1. Hằng năm cứ vào cuối thu, lá ngoài đường rụng nhiều và trên không có những đám mây bàng bạc.
2. Lòng tôi lại nao nức những kỷ niệm hoang mang của buổi tựu trường.

3. Tôi không thể nào quên được những cảm giác trong sáng ấy nảy nở trong lòng tôi như mấy cành hoa tươi mỉm cười giữa bầu trời quang đãng.
4. Những ý tưởng ấy tôi chưa lần nào ghi lên giấy
5. vì hồi ấy tôi không biết ghi và ngày nay tôi không nhớ hết.
6. Nhưng mỗi lần thấy mấy em nhỏ rụt rè núp dưới nón mẹ lần đầu tiên đến trường, lòng tôi lại tung bừng rộn rã.
7. Buổi sáng mai hôm ấy, một buổi mai đầy sương thu và gió lạnh.
8. Mẹ tôi âu yếm nắm tay tôi dẫn đi trên con đường làng dài và hẹp.
9. Con đường này tôi đã quen đi lại lắm lần, nhưng lần này tự nhiên tôi thấy lạ.
10. Cảnh vật chung quanh tôi đều thay đổi, vì chính lòng tôi đang có sự thay đổi lớn: Hôm nay tôi đi học.
11. Tôi không lội qua sông thả diều như thằng Quý và không ra đồng nô hò như thằng Sơn nữa.
12. Trong chiếc áo vải dù đen dài tôi cảm thấy mình trang trọng và đứng đắn.
13. Dọc đường tôi thấy mấy cậu nhỏ trạc bằng tôi, áo quần tươm tất, nhí nhảnh gọi tên nhau hay trao sách vở cho nhau xem mà tôi thèm.
14. Hai quyển vở mới đang ở trên tay tôi đã bắt đầu thấy nặng.
15. Tôi bấm tay ghi thật chặt, nhưng một quyển vở cũng chùi ra và chênh đầu chúi xuống đất.
16. Mấy cậu đi trước o sách vở thiệt nhiều lại kèm cả bút thước nữa.
17. Nhưng mấy cậu không để lộ vẻ khó khăn gì hết.
18. Tôi muốn thử sức mình nên nhìn mẹ tôi.
19. Mẹ tôi cúi đầu nhìn tôi với cặp mắt thật âu yếm.
20. Tôi có ngay cái ý kiến vừa non nớt vừa ngây thơ này: chắc chỉ người thạo mới cầm nổi bút thước.

The Status of Theme Types and Thematic Progression Patterns in English Written Biography Texts: A Systemic Functional Approach

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Abstract

This paper analyzes Theme and Thematic Progression in written biographies modeling Halliday's (1994, 2004) Systemic Functional Grammar, Daneš's Thematic Progression (TP) theory (1974), and McCabe's (1999) alternative TP hypothesis. The corpus includes 51 biographies of famous writers, totally adding up to 1495 T-units. The results showed that the Simple, Unmarked, and Non-predicated Themes were the most frequently used Theme types in the data. Also, the Constant TP pattern was the dominant TP type applied in the written biographies as descriptive texts, contributing, thus, to the correlation between the thematic organization of the text and the text type.

Keywords

Genre, Rheme, Text Type, Thematic Progression (TP), Theme

The study of Theme and Theme types and the distribution of Theme in the whole text play inevitable roles in the way a given text is to be organized. Particular among these is the

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circulation of the Theme-Rheme patterns and the contribution it makes to the general process of text production, a notion which has been termed as Thematic Progression (hereinafter called TP), in Daneš's (1974) terminology. Thematic Progression moves the text forward and by means of which the Theme and Rheme of single tokens of clauses in a text are linked to those of neighboring ones and finally to those of the whole text. Therefore, investigating the various patterns or types of the Thematic Progression helps us understand how a text is organized and in what manner the ideas are developed throughout.

Given the important role the Thematic Structure plays in the coherence of the text and also the way in which a given text is organized by a speaker or writer in the overall process of language interaction, one wonders in which way the writers or the speakers of different texts or discourses choose to employ different types of Themes and TP patterns and produce specific genres. The different weight a writer or speaker gives to each type of Theme or TP type determines the overall organization of their texts or discourses. Argumentative, descriptive, expository, instructive etc. texts, therefore, are expected to have different Theme types and TP patterns, a fact which gives them different coloring and yields distinctive genres. To this end, the present study attempts to analyze the Theme types and the TP patterns in one such genre - the written biography texts.

The rationale for choosing the biography texts is that there has been no preceding studies on biographies *per se* as an example of descriptive texts. Moreover, the study aims to testify the applicability of Halliday's framework of Theme types, Daneš's proposed TP patterns, and McCabe's (1999) revised approach to the notion of TP on the biographical texts and help explain the internal organization of the texts and justify the intentions beneath the writers' Thematic choices or the ideological dissemination of the texts.

The study attempts to find answers for the following questions:

1. What are the most frequently used Theme types in the texts?
2. What is the status of Theme markedness in the data?
3. What is the most frequently employed TP pattern?
4. Are Halliday's (1994, 2004), Daneš's (1974), and McCabe's (1999) models fully applicable in discovering the Thematic Structure and the internal organization of texts?

The organization of the paper is as follows: first, the theoretical framework of the study is presented. Then, a brief review of literature is sketched. Following that, the methodology of the

research is outlined. The results and discussion comprise the next section, and finally comes the conclusion.

Theoretical Framework

Thematic Progression

TP patterns play an important role in the connexity and interrelatedness of texts. “The organization of information in texts is determined by the progression in the ordering of utterance themes and their rhemes. . . [T]he relationship between successive themes and their rhemes would appear to provide a more satisfactory account of the 'method of development' of texts” (Downing, 2001), in contrast to Halliday and a group of other scholars within whose studies the functions of Themes and Rhemes have tended to be treated separately. The notion of Theme was first introduced by Mathesius, a member of the Prague School of Linguistics, and the founder of the theory of “*aktualního členění větného*”, instead of which the more convenient English equivalent “Functional Sentence Perspective” was later proposed by Jan Firbas (1994, p. 4) and which “deals with how the semantic and syntactic structures of the sentence function in fulfilling the communicative purpose intended for the sentence” (Firbas, 1986).

Mathesius, accordingly, ascribes two distinct functions to the notion of Theme: (i) the “starting point of the utterance” as “that which is known or at least obvious in the given situation and from which the speaker proceeds” and (ii) “the core of the utterance” as “what the speaker states about, or in regard to, the starting point of the utterance” (Mathesius, 1939; also cf. Daneš, 1974; Fries, 1976; Firbas, 1985). The former distinction is referred to as Given – New (Information Structure) while the latter is often called Theme – Rheme (Thematic Structure). Fries refers to Mathesius’ view of the Theme’s function as the “combining approach”, to be contrasted with Halliday’s definition of Theme’s function as “the point of departure for what the speaker is going to say” (Fries, 1985, p. 36). This being so, Halliday’s approach toward the concept singles out Mathesius’ second function for Theme, to be distinguished from the first notion. Accordingly, in the Systemic Functional (SF) theory, “Mathesius’ first function is ascribed not to Theme but to the element Given. Most of SF model linguists adopt these views, using as their justification the fact that the two functions identified by Mathesius as the functions of Theme do not necessarily have the function given as well; instead, under certain conditions, Theme might be conflated with New, thus no longer functioning as ‘that which is known or. . .

obvious” (Hasan & Fries, 1995, pp. xxvi-xxvii). Hence, “[S]ystemicists draw a function-to-form realization line between a relational-semantic conception of Theme (what the clause as a message is about) and the category of syntactic Theme (the point of departure of the clause)” (Gómez-González, 2001, p. 96).

“A concentration on Theme among systemicists has frequently tended to involve a relative neglect of the Rheme” (Downing, 2001), with focus on the notion of Theme and, to a lesser degree, on Rheme. At the same time, it fails to deal with the Theme-Rheme nexus across sentence boundaries, a negligence which is most notably observed in Halliday’s claim that goes: “thematization is independent of what has gone before” (Halliday, 1967, p. 17). Consequently, the discussions of clause as message should not focus only on the notions of Theme and Topic, rather a comparable attention needs to be allocated to the patterning and organization of Theme-Rheme structures over text.

In the same vein, Daneš and Fries claim that the way in which lexical strings and reference chains interact with Theme, i.e., the choice and distribution of Theme for each and every utterance, is not random; rather the patterns of interaction realize what they refer to as a text’s ‘Thematic Progression’ (Daneš, 1974) or ‘Method of Development’ (Fries, 1981). To state Daneš’s own wording,

the choice of the themes of particular utterances can hardly be fortuitous, unmotivated, and without any structural connexion to the text. In Fact, even a superficial observation of texts shows that the choice and distribution of themes in the texts reveal a certain patterning; . . . [T]he progression of the presentation of the subject-matter must necessarily be governed by some regularities, must be patterned (1974, p. 109).

Daneš’s main concern is to extend the concept of Theme as point of departure of a single utterance to that of explaining the inner connexity of texts. According to Daneš,

our basic assumption is that text connexity is represented, inter alia, by thematic progression (TP). By this term, we mean the choice and ordering of utterance themes, their mutual concatenation and hierarchy, as well as their relationship to the hyperthemes of the superior text units (such as the paragraph,

chapter, . . .), to the whole text, and to the situation. Thematic Progression might be viewed as the skeleton of the plot (1974, p. 114).

Daneš postulates three main types of TP patterns:

(1) Simple linear TP (or TP with linear Thematization of rhemes):

Daneš believes that type (1) represents the most elementary, basic TP. In this type of Theme Progression, the Rheme of a given clause becomes the Theme of the next clause.

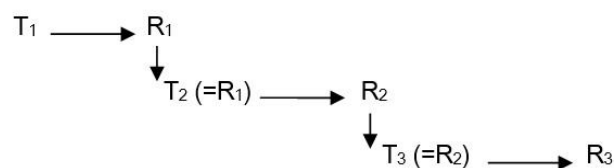


Figure 1. Simple Linear TP

(2) TP with a Continuous (Constant) Theme:

In this TP type, the Theme (or one of its elements) of a clause is selected as the Theme of the subsequent clause or clauses, though not necessarily with an identical wording.

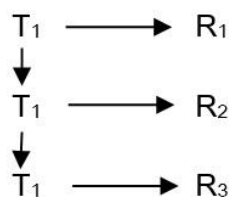


Figure 2. Continuous TP

(3) TP with derived T's:

In this TP type, the particular utterance Themes are derived from a “hypertheme” (of a paragraph, or other text section) so that the Theme of each individual clause is different. “The choice and sequence of the derived utterance themes”, in Daneš’s own wording, “will be controlled by various special (mostly extralinguistic) usage of the presentation of subject matter” (1974: 120).

Daneš goes on to suggest that the aforementioned types of TP could be exploited in different combinations, and he therefore considers the blending of type (1) and (2) as frequent, considering a “split Rheme” as the most important of such combinations:

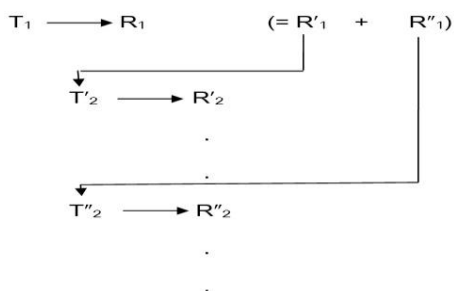


Figure. 3 Split Rheme

In Daneš’s own wording, “this type of TP is characterized by the fact that a certain R is explicitly or implicitly doubled ($R' + R''$) or multiple ($R' + R'' + R''' + \dots$), so that it gives rise to a pair (triple, . . .) of thematic progressions: first R' is expounded and after this progression has been finished, R'' becomes T of the second TP” (Daneš, 1974, p. 121). Daneš goes on to claim that TP²s are often complicated by various insertions (supplements, explanatory notes) or asides, or they may also occur in an incomplete or somewhat modified form. Furthermore, he asserts that these types of TP are to be considered as abstract principles, models, or constructs. The implementation of these models in particular languages depends on the properties of the given languages, especially on different means available for expressing FSP (Daneš, 1974, p. 121).

Theme, Theme types and Thematic structure

Key to understanding the TP patterns of the text is the recognition of the Thematic Structure (Theme-Rheme organization) of the single clauses which comprise a given text as a whole. Once we analyzed separate clauses for the distribution of Theme and Rheme, we set the initials for our major task of determining the patterning or grouping of Themes and getting to know how they are developed in the unfolding of the text. To this end, appreciating the different types of Theme and also the way they are distributed in an utterance seem highly important.

Consulting Halliday and Matthiessen, Theme can be categorized in a multifold way. In the first place, they classify the notion of Theme into three different types: textual, interpersonal and experiential (Topical) (2004, p. 79).

Topical Theme is the first group or phrase that has some function in the experiential structure of the clause (Halliday & Matthiessen, 2004, p. 66). Put another way, “[w]hen an [ideational] element of the clause to which a ‘Transitivity’ function can be assigned occurs in first position in a clause, we describe it as a Topical Theme” (Eggins, 2004, p. 301). These clause-initial elements typically include a Participant, a Circumstance, giving information about time, place, manner, cause, etc., and occasionally a Process (Gómez-González, 2001, p. 100). To reflect Halliday and Matthiessen’s own verbiage, “the most common type of Theme is a participant, realized by a nominal group” (2004, p. 67). At the level of form, the (Topical) Theme of a clause may consist of only one structural element which is represented by just one unit – one nominal group, adverbial group or prepositional phrase. Or it may alternatively comprise a complex of two or more groups or phrases, e.g., two nominal groups joined by ‘and’ or a prepositional phrase complex, forming a single structural element. There are, at the same time, some other clauses which lack thematic structure altogether, including non-finite bound clauses; embedded bound clauses functioning inside the structure of a nominal group as defining relative clauses; minor clauses lacking any mood or transitivity structure and typically functioning as calls, greetings, exclamations and alarms; anaphoric ellipsis, some part of which being presupposed from what has gone before; and exophoric ellipsis, taking advantage of the rhetorical structure of the situation (Halliday & Matthiessen, 2004, pp. 99-100).

Interpersonal Theme is a constituent to which we would assign a Mood label (but not a Transitivity label) and occurs at the beginning of a clause (Eggins, 2004, p. 302). It plays no part in the experiential meaning of the clause (Halliday & Matthiessen, 2004, p. 79). It is that part of the Theme coming before the Topical (experiential) Theme that is purely interpersonal in value (Matthiessen et al., 2010, p. 128). The interpersonal Theme includes one or more of the following five kinds of items: the Finite, typically realized by an auxiliary verb; a Wh-element; a Vocative, typically but not necessarily a personal name; an Adjunct, typically realized by an adverb; first and second person "mental" clauses (Gómez-González, 2001, p. 109; Halliday & Matthiessen, 2004, pp. 81-82; Matthiessen et al., 2010, p. 129).

Textual Themes are elements which do not express any interpersonal or experiential meaning, but which are doing important cohesive work in relating the clause to its context (Eggins, 2004, p. 305). These elements include a cohesive conjunctive element (however, therefore, because, although); a structural conjunction (and, or, but); a continuative (Oh, Well, Yea); a Wh-relative (which, who) (Gómez-González, 2001, pp. 111; Halliday & Matthiessen, 2004, p. 85-86).

In the second place, the notion of Theme is divided into simple and multiple. The notion of ‘Topical’ Theme which is related to the experiential metafunctions plays a significant role in the discussions concerning the Theme complexity. For one thing, the Topical Theme is the only necessary and obligatory thematic element in the clause, either implicit in the co(n)text or explicitly stated (Gómez-González, 2001, p. 108), since it always conflates with some Transitivity element (Hasan & Fries, 1995, p. xxxiv); in addition, the Topical Theme marks the closing part of the thematic portion (Taboada, 2004, p. 60) marking, in this way, the boundary between Theme and Rheme; furthermore, the iterative selection of the Topical Theme is possible only under certain conditions, and only if the Theme is marked (Hasan & Fries, 1995, p. xxxi). So, the recognition of the sequence of thematic elements in a clause deals directly with decisions pertinent to the thematic portion or the thematic zone, in which come to prominence the ideas of what counts as an initial position, and what is the principle for determining the boundary between Theme and Rheme.

As mentioned before, “the Theme of a clause extends up to the first element that has some representational function in the clause (the ‘topical’ Theme)” (Halliday & Matthiessen, 2004, p. 98). Having this in mind and all else being equal, the sequential organization of a Theme zone categorizes into marked and unmarked formats. The unmarked configuration for spoken English discourse is realized by the sequence ‘[Textual Theme] [Interpersonal Theme] [Topical Theme]’ while a Marked Theme zone displays a different sequential organization, such as ‘[Interpersonal Theme] [Textual Theme] [Topical Theme]’ or ‘[Textual Theme] [Textual Theme] [Interpersonal Theme] [Topical Theme]’. Consequently, Theme zone denotes the initial part of a clause which must end with a Topical Theme but may include Textual and Interpersonal Theme if realized before the Topical Theme (Fetzer, 2008, p. 8; Halliday & Matthiessen, 2004; Gómez-González, 2001, p. 108).

Theme markedness comprises another set of classifications of Theme, splitting it into two categories: Unmarked and Marked. The choice between the ‘Unmarked’ and ‘Marked’ Theme options in the thematic portion of English clauses is to do with the conflation of the element of Theme with the various elements of Mood Structure including declaratives, interrogatives (yes/no questions and wh-questions), and imperatives. To be more precise, “[f]or the systemic option marked versus unmarked is directly related to what Mood function conflates with topical Theme” (Hasan & Fries, 1995, p. xxxiv). That is to say, whenever we talk about marked or unmarked Themes, we are only concerned with the Topical Theme in the clause, rather than the textual or interpersonal Theme. The system of Theme ‘Markedness’ which differentiates between unmarked and marked Theme deals with the frequency or the degree of typicality of the thematic element under question, the unmarked Theme, thus, being more frequent and more typical than the marked Theme which is considered to be less frequent and less typical. The assumption is that “[a]ll things being equal, an unmarked choice will be made. When a marked choice is made, the speaker/writer is signaling that all things are not equal, that something in the context requires an atypical meaning to be made” (Eggins, 2004, p. 318).

Marked Themes have some characteristics in common: (i) they are explicitly foregrounded as a point of departure for the message; (ii) they add some sort of contrast; (iii) they are frequently marked off in speech by being spoken on a separate tone group (Gómez-González, 2001, p. 103). So, from this description about Theme markedness it follows that the unmarked Topical Themes are different for different clausal moods: for declaratives, the unmarked Topical Theme conflates with the Subject; in yes/no questions, the unmarked Theme is expressed by the final verbal operator which carries the expression of polarity ‘yes or *no*’ (is, isn’t, do, don’t, can, can’t, etc.), but since that is not an element in the experiential structure of the clause, the Theme extends over the following Subject as well, which conflates the Topical Theme; in the wh-questions, on the other hand, the unmarked Theme is expressed by the wh-element; and finally, for imperatives, the unmarked Theme is ‘Let’s’ (or ‘Don’t let’s’) or a Predicator – i.e., a verb (Gómez-González, 2001, p. 102; Halliday & Matthiessen, 2004, pp. 71-79; Eggins, 2004, pp. 318-319).

Still another strategy for making marked Themes is ‘Theme Predication’, by means of which the Theme of an original clause becomes the Rheme of a predicated clause which is frequently associated with a formulation of contrast: it was not . . . , it was . . . , who/which

The predicated Theme structure is similar to identifying (equative) clauses in sharing the equative feature, but they differ in that the Theme in the predicated Theme structure conflates with New information; i.e., it is contrastive (Halliday & Matthiessen, 2004, pp. 94-96).

Review of Literature

Quite a number of studies have investigated the choice of Theme types in different texts within the framework of Halliday's (1994, 2004) Systemic Functional Grammar, particular among them being Whittaker (1995), Martinez (2003), Jalilifar (2010), Hawes and Thomas (2012), etc. As well as this, Daneš's (1974) and MacCabe's (1999) Thematic Progression patterns have been the focus of many studies, each applying the model to some specific type of text, including Wang (2007), Yang (2008), Jalilifar (2009), Hawes (2010), Rørvik (2012), Ebrahimi and Ebrahimi (2012), Naderi and Koohestanian (2013), Jing (2014), etc. Along the same line with these empirical studies, therefore, the present research aims to investigate another genre of texts – biography texts - which has not been dealt with before within the Halliday's (1994, 2004) Systemic Functional framework on the one hand and Daneš's (1974) and MacCabe's (1999) TP patterns framework on the other hand.

Methodology

The model

The theoretical framework of the present paper is based on Halliday's (1994, 2004) Systemic Functional approach to the notion of Theme and Theme types. Theme in Halliday's SFG framework is defined as the initial element of the clause, the element regarded as the point of departure of the message which is selected by the speaker in the course of a linguistic message. Theme, in this analysis, is closely related to the notion of 'Given' as approached by other scholars, but as Halliday (1994, p. 299) and Halliday and Matthiessen (2004, p. 93) claim, "although they are related, Given + New and Theme + Rheme are not the same things. The Theme is what I, the speaker, choose to take as my point of departure. The Given is what you, the listener, already know about or have accessible to you. Theme + Rheme is speaker-oriented, whereas Given + New is listener-oriented" (2004, p. 93). As an initial element in the clause in Halliday's approach, Theme is comprised of different kinds of 'Topical', 'Interpersonal' and

‘Textual’ elements, with the Topical theme being the obligatory element in the initial position functioning in the transitivity of the clause.

Another general approach to the notion of Theme is the way the elements in the thematic portion of the clause go beyond the level of clause and contribute to the development of the text as a whole. This is different in essence from Halliday’s appreciation of Theme in that the latter is confined to the level of ‘clause’ as the domain within which the Theme is distributed and to which the Transitivity function is assigned. Rather, it focuses on the way information or linguistic message is patterned, organized or ordered in discourse beyond the level of clause, what has generally been known as part of the theory of language known as Functional Sentence Perspective (FSP) within the Prague School of Linguistics.

Following the general lines of argumentation concerning the distribution of Theme over single clauses, the present study has adopted Daneš’s (1974) dynamic concept of TP, claiming that “the organization of information in texts is determined by the progression in the ordering of utterance themes and their Rhemes” (Downing, 2001). Central to the notion of TP is Daneš’s (1974) acknowledgement of three main (single) TP types known as Simple Linear, Constant, Derived TP patterns, as well as a combining type referred to as Split Rheme.

But due to some shortcomings to Daneš’s theory concerning the organization of the text, an alternative approach seems inevitable. A problem often found in Daneš’s TP typology is the failure of some Themes to relate or chain to previous Theme or Rheme portions, leaving some gaps or breaks in the TP or Thematic Development of the texts. To cope with this shortcoming in Daneš’s (1974) theory, therefore, McCabe (1999) put forward a different kind of TP type in her Ph.D thesis to contain such thematic elements. She refers to these types of elements as ‘Peripheral Themes’ and insists that “[t]hese Themes are important to the organization of the discourse; they are only labeled as peripheral here in that they are peripheral to the Thematic Progression patterns” (McCabe, 1999, p. 180). McCabe classifies these Themes into four categories: pragmatic (including: Key Themes, sum, previous clause, back, related, new, adverbials of time and place, fronted), grammatical (fronted, extraposed elements, existential structures, thematic equatives, wh-elements), extralinguistic (‘we’, initial verbs in imperatives) and metatextual (referring to the text itself or the author’s purpose) (McCabe, 1999, pp. 180-189). McCabe does not take into account Daneš’s Derived TP type as a different pattern of TP for the sake of consistency (McCabe, 1999, p. 174), claiming that it may be related to some

preceding Theme or Rheme through some types of inference in simple linear or constant Theme[s] (Jalilifar, 2009, p. 88). Along the lines with MacCabe (1999), we have taken this approach in the present paper.

Choice of texts

The corpus of this research is confined to the written texts, as the written body of texts more readily undergo the thematic and TP analyses compared to the spoken texts. To testify our hypotheses, therefore, a corpus of 51 written biographies of most famous authors was retrieved from an online database (<http://www.famousauthors.org/>), the whole of which comprising 1495 independent clauses. The reason for considering the major/independent clauses (T-units i.e., units containing one independent clause plus one or more dependent clauses) as the target of our analysis is that these structures have the thematic structure (have a Topical Theme) and, consequently, have a function in the transitivity structure of the clause.

Procedure

Having selected the data, we decomposed them into separate T-units, units consisting of “an independent clause, together with all hypotactically related clauses and words that are dependent on that independent clause” (Fries, 1995, p. 49). T-units are recognized as the optimal units for textual analysis in the studies concerning TP (McCabe, 1999, p. 73), for those studying the thematic development of texts usually use the T-unit as their unit of analysis (Thompson & Thompson, 2009, p. 46). Having divided the data into separate T-units, we numbered all the units and identified a Theme/Rheme boundary for each. Then we identified the different Theme types for all the Themes in the corresponding T-units. Following this, we singled out the specific types of TP patterns as proposed in Daneš’s (1974) and McCabe’s (1999) progression types for each T-unit. We then determined the frequencies or the rates of each of the Theme types or TP types in question. Finally, we analyzed the results of the study and formulated hypotheses regarding the findings.

As we had expected, there were some Themes which could not be connected to previous Themes or rhemes from the viewpoint of Daneš’s (1974) typology due to their grammatical nature, and the analysis of them in terms of TP patterns in the selected data was impossible.

Following McCabe (1999), therefore, we put these elements into a separate group called the ‘Peripheral Themes’. Also, following McCabe (1999, p. 176), Themes for which the reader had to go back more than two clauses to find a previous mention of a concept were not counted as part of a TP chain; so, they were categorized as the ‘peripheral Themes’. Plus, still following McCabe (1999, p. 177), we analyzed verb-initial constructions with ellipsis, or pro-drop, as forming part in a ‘simple linear’ progression chain. Put another way, they were taken to have come from the previous Rheme. “This makes sense” McCabe (1999, p. 177) asserts, “as the verb in one Rheme forms a chain with the verb in the subsequent clause [...] given that the Subject for the verbs is the same, as is implied through the ellipsis, and the verbs have the same inflection” (McCabe, 1999, p. 177).

Significance of the study

The findings of this study will help better recognize the overall organization of the biography texts, i.e., the Theme types and the TP patterns which are to be used predominantly by the writers in an attempt to produce a descriptive text. The results will also benefit the EFL learners by getting them more conscious of a token of descriptive text and helping them produce more native texts in English.

Results and discussion

Having selected the data and decomposed the texts into separate T-units, we analyzed the obtained frequencies and rates according to the theoretical frameworks chosen for the analysis of the data. As mentioned above, the corpus of the study comprised 51 written short biography texts of most famous authors of all time as retrieved from the World Wide Web. The whole corpora contained 27136 words, with a mean average of about 530 words for each single text. The data comprised 1542 T-units, with an average of 30 T-units per text. The whole T-units were then analyzed to obtain the frequencies and percentages of theme types and TP patterns.

Table 1 shows the results of the frequencies of the Simple and Multiple types of Theme in the selected data. According to Table 1, the Simple Theme which consists of some experiential element - either a participant, a process or a circumstance - and is realized by nominal groups, verbal groups, adverbial groups or prepositional phrases, comprises 1334 T-units, equivalent to

86.51 % of the whole data. The Multiple Themes are used in 208 T-units and constitute, therefore, 13.49 % of the overall corpora. Following are some examples of simple themes⁴:

- T-unit 1: *[Agatha Christie]* is reputedly known throughout the world as the “Queen of Crime”. (Nominal group as the Theme)
- T-unit 2: *[On July 15, 1904]*, Badenweiler, Germany, Chekhov died. (PP as the Theme)
- T-unit 3: *[Today]*, he is remembered as a playwright and one of the masters of the modern short story. (Adverbial group as the Theme)
- T-unit 4: *[Writing for many local newspapers such as ‘El Universal’ in Cartagena and ‘El Heraldito’ in Barranquilla]*, Marquez began a career in journalism while bringing him to the end of his law studies. (Nominal group as the Theme)

Table 1. Simple vs. Multiple Theme Type

Theme Type	Frequency	Percentage
Simple	1334	86.51 %
Multiple	208	13.49 %
Total	1542	100 %

The predominance of the Simple Theme over the Multiple Theme in the overall data in the Theme position is illustrative of the fact that the writers of the biography texts in this study have tended to make the texts as easy to grasp and ready to understand as possible by the potential readers. The study argues that this finding is an expected fact about texts of this kind in a wider scope, as the writers of these sorts of texts are inclined towards focusing on the use of Simple Theme types to establish knowledge merely about the subject. These are the characteristics which pertained to ‘narrative texts’ as a variety of texts including biographies, novels, short stories, novellas, poetry, history books, and the like, to be contrasted with other text types like expository texts, argumentative texts, instructive texts, etc.

Table 2 shows the results of the frequencies and the percentages of the occurrence of different kinds of Multiple Themes in the subject position. According to Table 2, the Multiple Themes in this study constituted one of the five Theme sequences including [Textual ^ Topical], [Textual ^ Textual ^ Topical], [Interpersonal ^ Topical], [Textual ^ Interpersonal ^ Topical], and [Textual ^ Textual ^ Textual ^ Topical], the total of which make up 208 T-units.

4. The Thematic portion in [brackets]; the Subject / Topical Theme in *italics*.

T-unit 5:	[However, <i>they</i>] were only able to publish two issues . . .	(Tex. ^ Top.)
T-unit 6:	[and even (<i>Ø</i>)] transformed some of his plays into novels.	(Tex. ^ Tex. ^ Top.)
T-unit 7:	[Unfortunately, <i>in 1824</i>], his household expenses rose alarmingly.	(Int. ^ Top.)
T-unit 8:	[and most often (<i>Ø</i>)] focused on the human anatomy.	(Tex. ^ Int. ^ Top.)
T-unit 9:	[and then also (<i>Ø</i>)] obtained a PhD from the same university in 1948.	(Tex. ^ Tex. ^ Tex. ^ Top.)

According to Table 2, of the five Multiple Theme sequences used in the texts, the [Textual ^ Topical] Theme was the most frequently used pattern in the overall Multiple Themes, with the frequency of 168 T-units which equaled 80.77 % of the whole Multiple Theme types. The [Textual ^ Textual ^ Topical] sequence ranked the second with the frequency of 22 T-units and the percentage of 10.57 % of the overall Multiple Themes. The next most frequently used Multiple Theme type was [Interpersonal ^ Topical] which was used in 12 T-units. Next to come was [Textual ^ Interpersonal ^ Topical] with a frequency of 5, itself followed by the least frequently used sequence amongst the whole Multiple Themes.

Table 2. Multiple Theme Types

Multiple Theme Types	Frequency	Percentage
Textual ^ Topical	168	80.77 %
Textual ^ Textual ^ Topical	22	10.57 %
Interpersonal ^ Topical	12	5.77 %
Textual ^ Interpersonal ^ Topical	5	2.40 %
Textual ^ Textual ^ Textual ^ Topical	1	0.48 %
TOTAL	208	100 %

This implies that regardless of the Topical Theme whose presence is necessary in all types of T-units, in the two most frequent multiple sequences in the data which together comprise about 190 out of 208 T-units - hence 91 % of the whole multiple - the Textual Theme(s) function as the initial Theme in the combinations via the use of conjunctions, contributions, coordinators and subordinators. The high frequency of the Textual Themes in the initial position signifies that the writers of the biography texts under question have been trying to make use of as many textual

instruments and means as possible so as to make their texts cohesive enough and let the readers follow their lines of argumentation more conveniently.

Table 3 shows the results of Theme ‘markedness’ in the written biography texts. According to Table 3, the frequency of the Unmarked Themes in the corpora was more than two times as much as that of the Marked Themes. This is in line with Halliday and also other scholars’ findings regarding the status of Theme markedness in the studies concerning Theme types. As Halliday and Matthiessen note, for example, the Unmarked Theme “is the form we tend to use if there is no prior context leading up to it, and no positive reason for choosing anything else” (2004, p. 58).

Table 3. Theme Markedness

Theme Markedness	Frequency	Percentage
Unmarked Theme	1117	72.44 %
Marked Theme	425	27.56 %
Total	1542	100 %

As Table 3 shows, the Unmarked Themes comprised 1117 T-units which constituted about 72.44 % of the whole data, in contrast with the Marked Theme types which were used in 425 T-units and consequently made up a much smaller portion (27.56 %) of the overall Themes. Below are some examples of Unmarked and Marked Topical Themes:

- T-unit 10: *[Faulkner]* grew up in Oxford, Mississippi where his family moved in 1902. (Unmarked Theme)
- T-unit 11: *[In 1782]*, Blake entered into marriage with an illiterate woman, Catherine Sophia Boucher. (Marked; PP in the Theme position)
- T-unit 12: *[Although Shaw was occasionally linked with other women]*, he remained with Charlotte until her death. (Marked; independent clause in the Theme position)
- T-unit 13: *[A year later]*, Martin was the Executive Story Consultant for Beauty and the Beast at CBS. (Marked; adverbial group in the Theme position)

The choice of the Unmarked Theme is the result of the conflation of the Theme with the subject and is illustrative of the simplicity of the text under consideration. This claim could be justified by the fact that participants as the most typical representative of the Unmarked Themes comprise the greatest portion of the Topical Themes in the overall data, with a frequency of 1128

T-units which is equivalent to 73.15 % of the total sum, in contrast with the process and the circumstantial elements which comprised 3.11 % (48 T-units) and 23.74 % (366 T-units) respectively. These findings are illustrated in Table 4. The higher frequency of the Unmarked Theme “results in texts which are less argumentative in nature” (Ebrahimi & Ebrahimi, 2012: 82). It also helps the readers/audience to “follow the organization of the argument of the text” (Whittaker, 1995, p. 113) and makes them get more involved in the exchange of message. Moreover, the use of the Unmarked Themes may “give continuity to the texts and maintain coherence between sentences. In other words, the Theme or Rheme of the previous T-unit is used in the Thematic position of the next clause and this connects the T-units together” (Jailifar, 2009, p. 209).

Table 4. Element Types in the Theme Position

Element Types	Frequency	Percentage
Participant	1128	73.15 %
Circumstantial	366	23.74 %
Process	48	3.11 %
Total	1542	100 %

Another approach to the study of Theme is Theme Predication. Table 5 shows the results of the study concerning the use of Predicated or Non-predicated Theme by the author of the biography texts under consideration. As the statistics reveal, the predicated theme “as one of the ways in which [N]ew information precedes [K]nown information” (Martinez, 2006, p. 256) in discourse was just confined to 12 T-units, hence 0.78 % of the overall data. These Theme types, along with other constructions like Thematic equatives and fronted complements, are considered as Marked Themes. This is contrasted with non-predicated Themes which were used much more frequently in the data, as making up 99.22 % of the corpora and distributing in 1530 T-units.

The priority of non-predicated Themes over marked ones could be attributed to the fact that biographies in particular, and descriptive texts in general, are less persuasive and argumentative in nature (Francis & Kramer-Dahl, 1991). The predominance of non-predicated Theme through which the Themes coincide with the Subject of T-units could signify that, as in line with Francis and Kramer-Dahl (1991, p. 354), “the author does not intend to persuade, but rather that he feels constrained to allow the “facts” to speak for themselves. Hence he relies on “standard” information-ordering resources of the language to signal importance and relevance”.

T-unit 14:	<i>[Many of her books]</i> were made into TV adaptations.	(Non-predicated Theme)
T-unit 15:	<i>[Slowly]</i> he learned to cope with his situation.	(Non-predicated Theme)
T-unit 16:	<i>[It]</i> was due to this that Shaw abstained from alcohol throughout his lifetime.	(Predicated Theme)
T-unit 17:	<i>[It]</i> was during the time she worked for the hospital board that she started writing.	(Predicated Theme)
T-unit 18:	<i>[It]</i> was here that her love was writing flourished.	(Predicated Theme)

Table 5. Theme Prediction

Theme Prediction	Frequency	Percentage
Non-predicated Theme	1530	99.22 %
Predicated Theme	12	0.78 %
Total	1542	100 %

And lastly comes the statistics concerning the frequencies of the TP patterns in the biography texts. Following Daneš (1974) and McCabe (1999), the T-units were categorized into one of the three TP types. Table 6 shows the results of the frequencies and percentages of the different TP patterns as applied in the data.

Table 6. TP Types

TP Types	Frequency	Percentage
Constant	799	51.81 %
Simple Linear	423	27.43 %
Peripheral	311	20.17 %
Multiple	9	0.59 %
Total	1542	100 %

As Table 6 illustrates, the Constant Theme Progression pattern was used most frequently in the data (e.g., T-unit 19 below). It comprised 51.81 % (1542 T-units) of the overall TP chains, i.e., more than the total sum of the frequencies pertaining to all the other TP types. The second most frequently used TP type was the Simple Linear type (e.g., T-unit 20 below). It was applied in 423 T-units as equal to 27.43 % of the overall amount. The least frequent TP pattern to be

used in the data was the Peripheral Theme which was incorporated in 311 T-units and attributed 20.17 % of the whole percentage (e.g., T-unit 21 below).

T-unit 19a:	<i>[She]</i> also has the honor of being the most widely translated author.	
T-unit 19b:	<i>[Her books]</i> have been translated into more than 103 languages.	(Constant TP)
T-unit 19c:	<i>[She]</i> was born in Torquay, Devon, England.	(Constant TP)
T-unit 19d:	<i>[She]</i> did not receive any formal schooling.	(Constant TP)
T-unit 20a:	<i>[In 1820]</i> , he returned to Richmond and got accepted by The University of Virginia.	(Linear TP)
T-unit 20b:	<i>[There]</i> he found himself attracted towards Latin and poetry.	(Linear TP)
T-unit 20c:	<i>[His attachment with the university]</i> however was short lived as he had to leave on account of financial issues.	(Linear TP)
T-unit 20d:	<i>[His financial condition]</i> also had its effect on Poe's relationship with his foster father.	(Linear TP)
T-unit 21a:	<i>[This tension among the two]</i> led Poe to leave Allan's home with an ambition to fulfill his dream of becoming a great poet.	
T-unit 21b:	<i>[In 1827]</i> , when he was just eighteen, Poe published his first book Tamerlane.	(Peripheral TP)
T-unit 21c:	<i>[In 1829]</i> , Poe and John reconciled for some time honoring his foster mother's deathbed wish.	(Peripheral TP)

According to Table 6, the writers of the biography texts under consideration have given the highest weight to the constant TP chains. In the Constant Theme, "the same theme enters into relation with a number of different Rhemes. The result of this type of TP is that the Themes in the text constitute a chain of (typically) co-referential items which extends through a sequence of clauses" (Fries, 1995, p. 7). The preponderance of the Constant TP type over the other TP patterns leads to "simplistic, repetitive, and redundant paragraphs which may result from continuous application of the same topic" (Jalilifar, 2009, p. 105). The impression is that the predominance of the Constant TP in the present study leads the writers to give the leading role to the authors whose biography accounts are described. This is justified by the number of T-units in

which agents are syntactic Subject, hence functioning as ‘Participants’: 1128 out of 1542 T-units, as consulting Table 4 (Downing, 2001).

This finding is an expected fact about texts of this kind which are considered to be purely informative in purpose. In agreement with Wang (2007, p. 171), the (over)use of the Constant TP where the same Theme is chosen over several clauses or sentences is indicative of the very fact that the text often reads like a list, as there is a lack of further development of Rheme. In so doing, the writers/speakers of such sorts of texts tend not to expand on information introduced in the Rheme.

In conformity with the findings of the present study, Wang (2007, p. 171) comes to conclude that narrations and descriptions are characterized by the Constant Progression pattern to provide a more static text. This contrasts with argumentative texts, scholarly texts, advertising texts, complain letters, copywriting texts, T.V. commercials, etc. which contain opinions, bias as well as justification and are often used to persuade and provide reasons for your complaint and can provide a more dynamic effect through the cross-referential links from the Rheme of one clause to the Theme of the next clause. Be that as it may, writers/speakers make most frequent use of Constant Progression patterns to create more descriptive texts. In such cases, as Jalilifar (2009, p. 105) asserts, “little argumentation is required as the writer is hooking the reader because he might not want to ensure readers’ constant presence or optimally build up a conceptual scaffolding.”

A related line of research which has opened new avenues for many scholars is probing into the possible correlation between the distribution and choice of Themes (i.e., Thematic Progression) and the register the text belongs to or the rhetorical purposes of the text. The assumption is that “the overall organization of the text and the type of register it belongs to, i.e. the variety [. . .] of which a particular text is an instance, determines the choice of Theme in any particular clause or the general pattern of thematic choices” (Gómez-González, 2001, p. 99). This places such investigations in the areas of genre analysis and rhetorical studies (McCabe, 1999, p. 11).

Considering this, one important conclusion to draw is that different patterns of Thematic selection are attributed to different genres or registers like “recipes, weather forecasts, stock market reports, rental agreements, e-mail messages, inaugural speeches, service encounters in the local deli, news bulletins, media interviews, tutorial sessions, walking tours in a guide book,

gossip during a tea break, advertisements, bedtime stories and all the other innumerable text types” (Halliday & Matthiessen, 2004, p. 27), to name but a few. Put another way, “patterns of Thematic Progression do not occur randomly but are sensitive to genre. For instance, it has been suggested that narrative and expository texts normally show the same Topical Themes (lexico-referentially expressed) throughout stretches of discourse; while in instructions or argumentations Themes are typically extracted from the Rheme of the preceding clauses” (Halliday & Matthiessen, 2004, p. 27).

This is in line with the findings of the present study. The most commonly used TP type in the (written) biography texts under consideration as a special token of descriptive texts was the Constant Progression where the subject/Theme of one T-unit was used continuously throughout different sequences with an aim to produce a simplistic, repetitive, informative, and less persuasive text, as in contrast with the argumentative texts like scholarly articles or critical accounts which make much more use of Simple Linear TP type to expand the ideas continuously.

The findings also revealed that a small percentage of T-units did not fit into any of the thematic patterns suggested by Daneš (1974) and McCabe (1999). The Themes in these T-units referred back to an element in both the thematic and rhematic portions of the previous T-units simultaneously, and as understanding the Themes in such T-units necessitates an acknowledgment of both the elements in the Theme and the Rheme of the preceding T-units. For the sake of consistency, then, we classified them under a different category named ‘Simultaneous TP, to be distinguished from constant, Simple Linear and Peripheral TP types. The total of such TP Types in the present study came to 9 T-units as equivalent to 0.58 % of the overall data.

- T-unit 22a: *[He]* got married with *his ex-fiancée* Zelda in 1920.
- T-unit 22b: *[They]* had a daughter Frances Scott in 1922.
- T-unit 23a: *[Orwell]* married *Eileen O’Shaughnessy* sometime during 1936 and 1945.
- T-unit 23b: *[They]* adopted a son, Richard Horatio Blair.
- T-unit 24a: *[Wilde]* married *Constance Mary Lloyd* in 1884.
- T-unit 24b: *[The couple]* had two sons they named, Cyril and Vyvyan.

As examples 22-24 show, ‘they’ in T-units 22b and 23b as well as ‘the couple’ in T-unit 24b functioning as the Themes of their corresponding T-units make references to the elements in *italic* in their preceding T-units. The references are simultaneously made to the two elements in

the Thematic and the Rhematic portions of the preceding T-units, hence making them different in nature from the Constant and Linear TP types which refer back to an element in the Theme or the Rheme of their previous T-units, respectively.

Conclusions

The present study was an attempt to analyze Theme, Theme types, and TP patterns of written biography texts within Halliday's (1994, 2004) Systemic Functional Grammar and modeling Daneš's (1974) and McCabe's (1999) TP model. The findings of the study finally showed that the Simple Theme dominated the Multiple Theme, signifying that biographies and other texts of the narrative nature mostly prefer to establish knowledge merely about the subject, thus making texts as easy to understand as possible by potential readers (or listeners). Of the different sequences of the Multiple Theme, the sequences beginning with the Textual Theme(s) were most frequently used, showing that the texts were cohesive and flowed logically enough to let the readers follow the flow of discourse. Moreover, the Unmarked Themes were preferred to the Marked ones. This was illustrative of the simplicity of the biographies, where the Themes most frequently are conflated with the subjects and the texts are expected to be more descriptive in essence. The results also showed that the Non-predicated Themes were given priority over the Predicated ones, signifying that the texts under consideration are less persuasive and argumentative in nature.

The results concerning the different patterns of TP illustrated that the 'constant' (continuous) TP type was applied most frequently in the biographies, signifying that these sorts of texts are mostly simplistic and repetitive and result from the application of the same topic over and over again with an aim to create more descriptive texts, where the highest weight is attributed to the people whom the texts are about.

Furthermore, the results also revealed that a small quantity of the data could not be described based on the selected TP models, as their Themes refer back to 'both' the Theme and the Rheme of the preceding T-units. These TP patterns were classified under 'Simultaneous TP, to distinguish them from the Constant and the Simple Linear TP as well as the Peripheral Themes. It seems, therefore, that although either of Daneš's (1974) TP or McCabe's (1999) revised models may not be qualified enough to fully explain the organization of the texts separately, a combination of both the models yields quite satisfying results.

The study also shed some light on the relationship between genres or sub-genres and the TP types most frequently occurring, for now it is commonly held that it is the genre or the type of the text in general which determines many aspects of textual functioning, let alone other factors like purpose and intended readership, the amount of shared knowledge, social background of the readership, literacy of the readership, etc. Put simply, “it tends to be the overall organization of the text that determines the choice of Theme in any particular clause, or that determines at least the general pattern of thematic choices” (Halliday & Matthiessen, 2004, pp. 162-163). Familiarity with a variety of genres, thus, might lead to predictions that particular text-types would display preferred sequences of choices as regards TP (Downing, 2001).

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A Comparison of Formal Register through Lexical Choices in Heritage and Second Language Speakers of Spanish

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Abstract

Second language learners (L2s) and heritage speakers (HSs) can both present lacunae in their second or heritage language knowledge, leading to studies in which HSs' and L2s' linguistic abilities are compared (e.g. Montrul, Foote, & Perpiñán, 2008). One less explored area of comparison is that of pragmatics, which this study approaches through the analysis of formal register as expressed through lexical choices. In this investigation, Spanish L2s and HSs participated in a formal dialogic exchange. Based on a mixed methods analytical approach, findings show that L2s were confident in their ability to move within the register continuum while HSs were not. Additionally, findings indicate that L2s made better lexical choices within a high register context than HSs. Taking an ecological approach to language learning (van Lier, 2000), results are discussed and language learning affordances for L2s and HSs are identified. Pedagogical implications for the teaching of register in Spanish L2 and heritage classrooms are introduced.

Keywords

Formal register, Vocabulary, Heritage Speakers, Affordance, Spanish as a Second Language

Over the last few decades, the study of linguistic abilities in bilingual speakers has identified gaps in their language in comparison to that of monolinguals who develop the

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language in full. This phenomenon has been described as bilinguals experiencing incompleteness or imperfect language learning (Montrul, 2004; Shardwood Smith & Van Buren, 1991; Silva-Corvalán, 2003).

Two populations that can experience incomplete or imperfect learning of either the second or first language are second language learners (L2s) and heritage speakers (HSs). While L2s are described as English speakers who learn a foreign language (L2), defining HSs can be challenging due to the heterogeneous linguistic skills of these individuals. However, there is one common trait that unifies HSs, which is learning the heritage language in the home (Valdés, 2001). Because of the manner in which L2s and HSs learn the language in question, in this study Spanish, each group presents potential language learning incompleteness.

The notion that both HSs and L2s can face incomplete learning has resulted in a series of studies in which the linguistic abilities of these two populations have been compared, including the analysis of tense and aspect (Montrul, 2002), unaccusativity (Montrul, 2005), gender agreement (Montrul, Foote, & Perpiñán, 2008), negation (Meisel, 1997), inflected infinitives (Rothman, 2007), subjunctive mood (Potowski, Jegerski, & Morgan-Short, 2009) and differential object marking (Montrul & Bowles, 2009). So far, research has primarily focused on syntax, with ramifications for semantics, but has left other linguistic areas mostly unexplored. One of these areas is pragmatics. Considering this gap, the purpose of this study was to investigate one area of pragmatics: register in HSs' and L2s' speech.

Register can be studied through the observation of diverse linguistic features, lexical choices being one of them. Choosing the appropriate lexicon entails that the speaker actually possesses the vocabulary necessary for the linguistic interaction, no matter if the situation calls for more or less formal vocabulary. One challenge that HSs and L2s have in common regarding vocabulary and register is that they tend to lack the lexicon required to perform in formal exchanges (Hyland & Tse, 2007; Kagan & Friedman, 2003; Valdés & Geoffrion-Vinci, 1998).

The current study explored lexical choices made by HSs and L2s during a formal interview. The research questions that guided this investigation were the following:

- (1) Is there a difference in the lexical choices made by HSs and L2s during a formal conversational exchange? If so, what are these differences?
- (2) What are Spanish native speakers' perceptions of participants' lexical choices with regards to their suitability for a formal context?

This study's significance is twofold. First, it explores linguistic features of Spanish HSs, a population that continues to grow in the United States and to assert its presence in university language programs (Potowski, Jegerski, & Morgan-Short, 2009). Second, the comparison of L2s' register proficiency with that of another population promotes an understanding of how register is taught, learned, and employed by these speakers beyond the language classroom.

In order to fulfill this study's objectives, the review of the literature defines register and describes how the lexicon plays a role in it. It explores how HSs and L2s acquire register and concludes with a discussion of the affordance construct within an ecological approach to language learning. The methodology section describes how conversational data were gathered and analyzed for this investigation. An analysis of the collected data follows as well as a discussion of the findings. Concluding remarks emphasize the need to acknowledge learners' language learning histories in order to better meet their needs in the classroom.

Review of the Literature

Register and the lexicon

Register is part of a person's pragmatic knowledge and is defined as a conventional pattern of configuration of language that matches a situation or context. These configurations of language are shaped according to the context topic, the interpersonal relation between the interlocutors, and the channel of communication (Cox, Fang, & Otto, 1997). Once such configurations are made, speech is shaped according to social norms that better fit the situation. For each social context, speakers have different registers available to them which are activated according to either the role the speaker fulfills in it (e.g. boss or employee) or the situation imposed by the context (e.g. a job interview).

Vocabulary has an essential role in aiding the speaker to apply a chosen register by differentiating between more or less formal terms. Lexical choices can show degrees of politeness (Scarcella & Brunak, 1981) or the speaker's ability to move in specific circles of interaction, for example, in business (Cortés de los Ríos, 2002). Register choices also allow the speaker to display ranges of competence by going beyond everyday language usage (Pajupuu, Kerge, & Alp, 2009). Speakers select high register forms when they seek to be evaluated positively by the listener and when they wish to show deference or maintain social distance

(Levin & Garrett, 1990). Indeed, it has been purported that native speakers possess an intrinsic understanding of how words can mark changes in low- and high-register situations (Neufeldt, 1999).

The lexicon used in formal register is different in nature and frequency to everyday language. Specific lexical markers that can determine register include word frequency, the use of colloquial terms, jargon, word length, and, in bilingual speakers' speech, code-switching (Valdés & Geoffrion-Vinci, 1998). In regards to frequency, while everyday language is described as having a simple linear equation, more sophisticated language is characterized by an s-curve and a relative use of major articles, conjunctions, prepositions, pronouns, rarer content, and function words (Hayes, 1988). In HSs' speech, the use of colloquialisms, slang, and code-switching may suggest a speaker's apparent lack of more appropriate terms for a given social context (Colombi, 2009).

Register in the heritage language

Normally, Spanish HSs are immersed in the Spanish language during the first years of their lives. Eventually, the English social environment displaces Spanish, their L1 (e.g. Kohnert, Bates, & Hernandez, 1999; Merino, 1983). Thus, the question remains if they are able to truly develop the ability to comprehend and utilize appropriate lexical items based on high and low register contexts before the Spanish language is displaced.

Research on children and register has demonstrated that they comprehend variabilities in social contexts and their corresponding linguistic register early on. Bates (1977) reported that Italian first graders were socially aware of the negative connotation that speaking their dialect had in comparison to speaking standard Italian. Weeks's (1971) study investigated children's use of ten speech registers that served to express different meanings. Some of these speech registers started emerging when children were just over a year old. In Shatz and Gelman (1973), four-year-old children were asked to address an adult and a two-year-old child. A significant listener's effect was found for amount of speech and linguistic features. Brizuela, Anderson, and Stallings (1999) observed the use of discourse markers in the role-play speech of children aged six to ten. Children used more discourse markers with characters that had a high status than with those of lower status. Lastly, Bates and Silvern (1997) found that preschoolers could differentiate between producing more or less polite forms.

The first indications of children's awareness of social variation emerge as early as one year of age. Over time their social awareness is refined and the linguistic features necessary to mark their language according to social norms continue to develop. Based on prior research, it can be assumed that during the first years of their lives, HSs develop some knowledge of Spanish registers; however, it is doubtful that they will have a fully developed formal register and the lexicon connected to it before the Spanish language displacement occurs with the beginning of formal education. Register learning is then impaired by the fact that the child's interactions in Spanish within the bilingual community will continue to be of a casual and informal register, while all other formal exchanges, both formal and informal, will take place in English (Colombi, 2009; Valdés & Geoffrion-Vinci, 1998).

Register in the L2

Register in the L2 context involves knowing how to use the language in various social circumstances. Much of the work done on L2 register concerns speech acts—that is, teaching L2 learners how to request, refute, complain, etc. (Gass & Selinker, 2000). However, this approach does not completely prepare speakers to function appropriately in a variety of situations. L2 learners need to be able to perform speech acts in different registers, from addressing a five-year-old child to a high-status figure.

L2 teaching materials have been alleged to be inadequate for teaching register. In an overview of English as a Foreign Language (EFL) textbooks, Vellenga (2004) found that teaching materials rarely include comprehensible explanations of how conversation rules work in the target language. Yeung (2009) researched the misuse and overuse of the discourse marker *besides* by Hong Kong Chinese learners of English as a second language (ESL) and found that teaching materials did not provide sufficient information on this word's appropriate usage, thus contributing to the problem.

Hikyoung (2007) observed that in addition to poorly designed materials, the lack of authentic opportunities for practice makes register troublesome for L2 learners. This is clearly seen as the typical L2 classroom is made up of a teacher and a mostly homogeneous group of students in which the teacher is the only authority figure. Exchanges in the classroom between the teacher and students do not usually go beyond typical class interactions on class-related content. This learning environment only allows for the use and learning of Spanish informal registers connected to casual and friendly contexts.

Theoretical framework

Van Lier (2000) argued for an ecological approach to researching language learning, be it first, second, or foreign. One premise that supported his argument was that learning is fundamentally determined by learners' perceptual and social activity in verbal and non-verbal interaction. He observed that learners are immersed in environments that are full of meanings which gradually become available to them as they engage in interaction.

An ecological approach to language learning acknowledges interaction in its totality within a specific setting and the unique affordances it presents (Thoms, 2014; van Lier, 2000). Affordances are the particular properties of the environment that promote learning. They arise out of learners' interaction and participation. However, learners determine if a given affordance is of value to them or not, which implies a dynamic approach to learning in which the individual interacts with other participants in a given environment and is able to notice and make use of available affordances (Thoms, 2014; van Lier, 2000).

An ecological view on learning embraces an emic perspective. This means that there is an interest in comprehending the experience from the point of view of those involved in the activity. The advantage of an emic approach is that it aids in contextualizing the experience, recognizes individual differences, and emphasizes the product over the process (Lafford, 2009).

In the current study, the setting and affordances available to L2s and HSs as they learned Spanish are useful to understand their current abilities in the language. Furthermore, participants' own perspectives on their linguistic skills further contribute to creating a more complete picture of their language learning histories and the pedagogical needs of HSs and L2s in the language classroom.

Methodology

Participants

Four Spanish HSs and four Spanish L2 learners participated in this exploratory study. The sampling method was a snowball or chain procedure among the researcher's colleagues and acquaintances at the university where she was employed.

Each group included three men and one woman. The HSs were second-generation Spanish speakers who had been born in the U.S. and only spoke Spanish in their homes. The HSs

were active bilinguals (Valdés, 2000) and reported to continue to use Spanish daily in family events, work, church, and other community events.

L2 speakers had completed extensive coursework in L2 Spanish. Two participants had lived in Spanish-speaking countries for two years in fulfillment of missionary service for their church. The female L2 speaker was enrolled in a graduate Spanish program and taught elementary Spanish courses. All L2 speakers continued to use Spanish daily either in talking to others at work, church, and community events. The HSs and L2s were of similar social and economic status, age (25 to 35), and educational background (undergraduate and graduate degrees). All participants resided in central Texas.

In order to determine comparable Spanish proficiency among participants, the researcher conducted an informal interview with each of the participants prior to the data collection interview for this study. In this informal meeting, participants were questioned about their linguistic background and were engaged in a series of prompts to test their linguistic ability to fulfill various functions (e.g. if you were the current President of the United States, what would you do differently?). ACTFL (2012) rubrics for speaking and listening were utilized as a guide in determining that all participants were within the advanced range. ACTFL guidelines describe advanced speakers as being able to clearly and actively participate in conversations on a variety of topics. They can handle unexpected complications during the linguistic exchange and their speech can move within major time frames. They also control grammatical structures and generic vocabulary.

Additionally, four Spanish native speakers were recruited. Three of them served as raters and the fourth one, Dr. M, conducted the interviews. In an effort to keep as much homogeneity as possible among all those involved in the study, the native speakers shared similar educational, social and economic status. Raters were from Argentina and Spain and had lived in central Texas for three, four, and ten years. The rater who had resided in Texas for three years had previously lived in another state with a large Hispanic population. Dr. M, a native from El Salvador, had lived in Texas for over 40 years. She was 70 years old. All raters and Dr. M were familiar with the Spanish spoken in central Texas. They were Spanish instructors at the local university and worked with HSs and L2s in their classrooms.

Procedure

The HS and L2 participants were invited to be interviewed individually by Dr. M in her office at the local university's campus. They were informed that the purpose of the interview was to gather data for a linguistics study. Upon their arrival, each participant was instructed as follows:

You will have an interview with Dr. M., who is a Spanish Professor at XX University. Dr. M. is 70 years old. She is an expert in the field of Spanish learning. Please address her politely and appropriately according to her age and status. First, she will ask you a set of questions. There are no right or wrong answers. Then, you will be asked to ask her at least five questions.

The interviewer utilized the same prompts with each participant. She had been instructed by the researcher to carry out a formal conversation with the participants and to utilize high register language forms; i.e. low-frequency words, jargon, and addressing speakers with the formal *usted* (second-person 'you') pronoun. The interview was divided into three sections:

Introductions: Describing family life, employment, place of residence, hobbies.

Language status: Describing how Spanish was learned. Other matters regarding confidence in using Spanish, and ability to adapt language to different contexts.

Role-play: Dr. M and the interviewee engaged in a role-play. Participants were first instructed to borrow Dr. M's car and then report to her that they had been in a car accident in which her car had been damaged.

These conversations were recorded and transcribed. As a next step, any information that could disclose the linguistic background of the participants was removed from the transcripts. The three native speakers of Spanish that served as raters received hard copies of the blinded transcripts. They were instructed by the researcher to review the transcripts and assess the participants' lexical choices and their suitability for a high register exchange. As part of this analysis, raters completed a form (Appendix A) in which they assessed lexical choices (colloquialisms, slang, etc.) and determined how well the speaker could communicate in situations that varied in formality. Raters were also encouraged to utilize their own intrinsic

judgment as native speakers in determining levels of formality and the lexical choices made by the participants.

Data analysis

The data were analyzed through a mixed-methods approach. Quantitative data included a measure of word frequency and length in the participants' speech. Word frequency was calculated by comparing the frequency of terms employed by L2s and HS according to their stand in the Davies (2005) frequency dictionary. Word length was analyzed as well on the basis that longer words usually convey more specific and specialized meanings than shorter ones (Biber, 1998), for which they fit better within high register contexts.

Tokens for analysis were extracted from the role-play section. This section was selected because of the complexity and face-threatening nature of the situation. It was expected that these circumstances would induce participants to use less familiar terms in order to show responsibility and respect for the interviewer and awareness of the high demand they were imposing on her.

Tokens for analysis were compressed into unique items by, for example, reducing conjugated forms into infinitives, thus accounting for a total of 93 and 89 tokens for HSs and L2 speakers respectively. Terms not identified in the Davies dictionary were discarded for analysis since their frequency was not available. Discarded terms were: *gasolina* (gasoline), *nomás* (just like that), *chance* (chance), *celular* (cell phone), *camioneta* (truck) and *aseguranza* (insurance) from the HS speech, and *estacionamiento* (parking area), *estacionar* (to park), and *troca* (truck) from the L2 group. A *t* test analysis that considered both the status of each token in Davies's dictionary and the token's frequency in the interaction was calculated. Appendix B includes the list of words organized by frequency. This list also contains word length values for each term. In order to compare the length of the words used by HSs and L2s, a *t* test was performed comparing the number of letters included in the words uttered by participants of each group.

The qualitative analysis was performed through memoing and data triangulation of the raters' assessments, the participants' own commentary on their ability to perform in high register contexts, and the learners' lexical features during the interview. Conversation analysis techniques were applied to the transcript analysis (adapted from Smith, 2007). The analysis of lexical choices focused on colloquialisms, jargon, and code-switching; other relevant features emerged from the data. Moreover, anecdotal data were collected from the participants' and the raters' commentaries.

Results

The results are presented in four sections: first, statistical reports for word frequency and word length; second, an analysis of participants' lexical features; third, a summary of participants' own perceptions on their ability to adjust their speech based on register contexts; and fourth, the raters' analysis and commentary.

Word frequency and word length

A *t* test analysis that considered both the status of each token in Davies's dictionary and the token's frequency in the interaction was calculated. In this analysis, the HS group ($n = 236$, $M = 499$, $SD = 948$) performed significantly differently from the L2 group ($n = 192$, $M = 285$, $SD = 534$) by including in their speech a higher number of low-frequency terms ($t(426) = 2.78$, $p = 0.006$). This result suggests that L2 learners utilized more low-frequency words.

In order to compare the length of the words used by HSs and L2s, a *t* test was performed comparing the number of letters included in the words uttered by participants of each group. In this test, the word length of HSs ($n = 838$, $M = 6.188$, $SD = 2.51$) and that of L2s ($n = 863$, $M = 6.21$, $SD = 2.53$) was not significantly different ($t(1699) = 0.192$, $p = .848$).

Participants' speech: Lexical choices

The analysis of participants' speech focused on colloquialisms, slang, jargon, and code-switching. Other structures were also observed such as second-person pronoun use (informal *tú* or formal *usted*) and the use of vocatives to address the interlocutor.

In terms of colloquialisms, code-switching, slang, and jargon, while the first two were common in the speech of both HS and L2, there was no slang and limited jargon. Colloquialisms were plentiful in the speech of both HSs and L2s, but they were especially salient in the speech of HSs. Some of the colloquialisms employed by HSs were *aventón* (ride), *híjole* (an interjection meaning "Jeez!"), and *pos* (short form of *pues*, meaning "then"). Sample colloquialisms used by L2s were: *güerito* (little blonde person), *ahorita* ('now' in the diminutive form), and *m'ija* (apocopated form for *mi hija* or my daughter). Amusingly, this last item, *m'ija*, is the term the L2 speaker called his dog.

Code-switching, which happened inter- and intrasententially, was utilized together with circumlocution when participants appeared to face a lexical gap. The first example illustrates code-switching as the HS replaced the Spanish term '*grasa*' with 'fat.' The second example

shows circumlocution for the term ‘networking’ by an L2 participant. Examples have not been edited in order to maintain authenticity.

(1) PH1: *Como se hace fat y todo como lo puedes quitar*

[How fat is produced and everything how you can remove it]

(2) PL1: *Otras profesionales de mi industria para conectar*

[Other professionals in my industry to connect with]

A strategy mainly exercised by L2s was the use of Latin originated cognates. Examples 3 and 4 illustrate this strategy. Of special interest is the fourth example in which the speaker offered the English term and after pausing and thinking about it, produced a Spanish equivalent.

(3) PL2: *Quiero vender bienes raíces glo-(.) globalmente*

[I want to sell real estate globally]

(4) PL3: *Yo estaba estudiando en (.) mass communications, las (.) comunicaciones*

[I was studying in, mass communications, communications]

Low-frequency words were most commonly used by all participants when describing specific fields that described the participants’ employment or hobbies. Examples include: *topógrafo* (topographer), *bienes raíces* (real estate), or *ciclismo* (ciclism). This would suggest a richer vocabulary for specific fields relevant to their lives.

In terms of pronominal usage to address the interviewer, the preferred choice for these interactions would have been the formal *usted* since Dr. M outranked the interviewees in status and age and was a new acquaintance to all the participants. It was found that two HSs consistently addressed the interviewer with *usted*, while the rest of the participants, both L2s and HSs, were inconsistent in the use of the pronouns and switched back and forth between *tú* and *usted*. Overall, though, the informal *tú* appeared to be more prevalent than formal *usted*.

Vocatives addressing the interviewer were also inconsistent. The participants called her *Doctora M* (‘Doctor M’), *Señora M* (‘Mrs. M’), and *Doctor M* (‘Doctor M,’ without the necessary feminine agreement). This was frequent in the speech of both HSs and L2s, except for the two HSs mentioned before who used the pronominal form *usted* correctly and throughout the

exchange. Frequently, participants intertwined a formal vocative, such as *Doctora M*, with the pronoun *tú* in the same sentence, thus creating much register incoherence.

A formality marker present in one of the interviews with a HS was an appropriate exchange of greetings. The interviewer asked the interviewee for her name, she answered and in the same turn asked the interviewer's name. After the interviewer introduced herself, the HS expressed *mucho gusto* ('pleasure to meet you'). This formality exchange was not present in any other interview.

Participants' perceptions of their register skills

In general, L2s expressed that they felt confident in their ability to function well in both high- and low-register contexts. All participants, except one HS and two L2s, expressed concern for high-register contexts requiring academic vocabulary in particular.

Regarding informal contexts, HSs commented on their difficulty to fit in very informal situations. Specifically, HSs mentioned that they had trouble understanding slang used by their native Mexican friends since such terms were unknown to them. In particular, one HS explained that he did not know slang because his mother did not use that type of language, so he never learned it.

Raters' assessments

Raters received transcripts of the participants' conversations with Dr. M in which all information that could reveal their language-learning histories was deleted. They also received a rubric from the researcher. The first task in the raters' rubric was to assess how well each participant would fit in contexts that ranged in formality based on their lexical choices. In the rubric, three situations required high register, i.e. meeting with the King and Queen of Spain, with Mexico's president, or with a CEO. The other three contexts required lower register forms, i.e. attending events with friends, family, or coworkers. One rater, though, commented on register expectations for the situations given in the rubric. She stated that gatherings with family and coworkers present higher demands for appropriate communicative skills than a celebration with friends. All raters agreed that speaking with the King and Queen of Spain and talking to the President of Mexico were always formal contexts that required a formal register.

Frequencies were calculated based on the raters' favorable responses thus assigning each participant a score for their ability to perform in formal and informal settings, as shown in Table 1. A score of nine was the highest possible score.

Table 1. Participants' scores

Speaker	Informal contexts	Formal contexts
HS 1	9/9	0/9
HS 2	7/9	0/9
HS 3	6/9	0/9
HS 4	7/9	3/9
L2 1	7/9	2/9
L2 2	4/9	0/9
L2 3	7/9	1/9
L2 4	9/9	5/9

Based on these raters' assessments, L2s had better scores in formal contexts and HSs in informal situations. One rater noted that a few of the participants with low formal context scores would be able to engage in a meeting with Mexico's president as long as it was in private.

In their commentary, raters concurred that the use of diminutives, which was common in HSs' speech, made the participants sound informal, at times even childish. Sample 5 exemplifies the use of diminutives by a HS. This participant was highly educated and currently pursuing a PhD in Agronomy. Despite the formality he most certainly managed in English when speaking about his employment and career, his language choices in Spanish appeared to not convey the same formality.

(5) PH 2: *Tengo un trabajito dentro del departamento de agronomía en XX, pero más que todo estoy estudiando*

[I have a little job at the Agronomy Department at XX, but mainly, I'm studying]

In their comments, raters also pointed to other lexical choices that had influenced their ratings. Examples 6 and 7 reproduce a rater's analysis of lexical items, which she underlined in the transcripts, that aided in her evaluation of L2s utilizing a more fitting lexicon.

- (6) PH2: *Me gusta hacer ejercicio y también cualquier cosa que está al aire libre, entonces, saliendo en excursiones, voy a estudiar plantas afuera, entonces, a::h, eso es lo que hago con mi tiempo libre*

[I like to exercise and also anything that is outside, then, doing field trips, I go to study plants outside, then, ah, that is what I do with my free time]

- (7) PL3: *Yo vivo en XX, y originalmente, hace como unos cuatro (.) cuatro o cinco años, que compramos la casa, pero todo estaba como (..) las vacas pastando tranquilamente, las hierbas creciendo por todas partes, y una casa o dos había en los alrededores, ¿no? De repente, empezaron ¡puff! a todas partes. Como si fueran hongos, y ahora estamos rodeados de todo*

[I live in XX, and originally, about four, four or five years ago, that we bought the house, but everything was like, the cows calmly grazing, grasses growing everywhere, and there was a house or two in the area, you know? Suddenly, they started, boom! Everywhere. As if they were mushrooms, and now we are surrounded by everything]

Based on the raters' assessments, L2s utilized standard linguistic forms that appeared to mimic written language, which were deemed to be more appropriate in a formal context.

Discussion

This study has investigated formal register in the speech of HSs and L2s as expressed through lexical choices. In answering the first research question on differences between HSs and L2s, the results have demonstrated that L2s employed more low-frequency words than HSs. Colloquialisms and code-switching were common among all participants; however, code-switching appeared to be more prevalent in HSs' speech most likely to fill lexical gaps (Weinreich, 1953). All speakers appeared to utilize more low-frequency words in describing their professions and hobbies, that is, topics that they were familiar with. HSs addressed the interviewer with the correct pronoun *usted* more frequently and consistently than L2s. They also utilized vocatives more appropriately.

When participants were questioned about their ability to speak in formal and informal registers, HSs stated that they were unable to comprehend slang or low-register speech in general. L2s reported having no difficulty speaking in either high or low contexts. Both HSs and L2s stated that they would struggle in contexts requiring academic vocabulary.

These results suggest that L2s' speech included lexical items that were more fitting in a high-register context. However, HSs appeared to be more knowledgeable and culturally aware than L2s in carrying out linguistic functions that contributed to supporting the social exchange, including the use of appropriate vocatives and the formal *usted* pronoun to address the interviewer.

When referring to their own abilities, L2s showed confidence in their linguistic skills; HSs, on the other hand, were quick to point out their limitations. While the L2s' response demonstrates pride and value in their linguistic abilities, it might also suggest a lack of awareness of limitations in their second language as a result of not having been confronted with situations that demand register adjustments. The HSs' response, on the other hand, reveals a rather underrated view of their Spanish, as it has already been reported in literature on HSs (e.g. Potowski, 2011, as cited in Potowski, 2012). Their assessment might be founded upon more frequent and diverse exchanges in Spanish than their L2 counterparts which may have resulted in feelings of linguistic inadequacy (Martínez, 2003; Potowski, 2012).

In regard to the second research question, raters favored L2s in their ability to make better lexical choices. Raters' unfavorable assessment of HSs' speech over that of L2s' pointed to diminutives. Research on Spanish in the United States has identified the use of diminutives as matching Mexican popular Spanish. Its function is to express sincerity, involvement, and connection with the interlocutor as well as politeness (Curco, 1998; Elias-Olivares, 1995). In the current study, the presence of diminutives had a negative impact on the HSs' ratings. It is possible that the frequency and misuse of diminutives contributed to what has been identified as the irritation factor, which is defined as the degree to which an error causes a negative reaction in the interlocutor (Birdsong & Kassen, 1988), thus causing more negative responses in the raters.

An ecological perspective on language learning calls for the identification of affordances in the Spanish L2 and HS contexts that contribute to the development of register as captured in the speech of this study's participants. In regard to the L2 participants, it has been noted that they tend to speak a kind of 'classroom Spanish variety', rather than a Spanish characterized by

dialectal traces. Such classroom Spanish has been associated with the lack of exposure L2 speakers have to authentic situations and also to the absence of sufficient instruction in the classroom on register (Hikyung, 2007; Vallenga, 2004). According to the raters' assessment in this study, this classroom Spanish seemed to be a preferable variant in formal situations. The question remains, then, whether L2s, who perform well in a high-register setting, would have been able to effectively adapt their language to a lower register context or if they only possess a one-register language that they employ in every occasion. Their difficulty to sustain formality through the third person formal *usted* pronoun and conjugations, a form not usually employed in the classroom, might point to their inability to move within the register continuum.

For HSs, the analysis calls for the identification of language-learning affordances mainly in the home, where they learned Spanish. As seen in the literature review, children start early on to comprehend situational markers and to adapt their speech accordingly. However, HSs experience a shift early in life to English, the dominant language, and do not participate in any schooling in Spanish, which can be seen as a source of high-register models starting at a young age. Thus, parents and other Spanish-speaking relatives and friends become their only source of language learning (Kagan, 2005). As a consequence, HSs are exposed mostly to familiar and casual registers spoken in familiar settings in Spanish. In English, though, they participate in a variety of contexts and develop the ability to adapt their speech accordingly. Indeed, in this research, while some participants were highly educated and most certainly aware of formal register forms in English, their Spanish skills did not adequately reflect the same status. Moreover, not only did the HSs appear less capable of functioning in high-register settings, they also reported difficulty in functioning in overly informal settings. As reported by one of the participants, he could only speak in Spanish like his mother did.

As seen in this research, because of the various factors that afforded their Spanish learning, L2s and HSs differ in their language-learning histories and needs. Although it is common to have mixed classrooms in which L2s and HSs work side-by-side (Valdés, 2001), this study contributes to the existing body of literature that calls for language courses designed for HSs in which their specific needs determine the curriculum (e.g. Martínez, 2003; Valdés, 1981).

For L2 teaching, this study provides a glimpse into what L2 students are able to accomplish with the skills they develop and hone in the classroom. Findings encourage creating opportunities for L2 learners in which they can interact spontaneously with native speakers in a

variety of contexts in which registers vary. With opportunities for practice, L2 learners can expand their lexicon and learn to identify register cues employed by their interlocutors so they can respond adequately.

Given the small number of participants in this study, results and conclusions are exploratory. Moreover, the study took place in central Texas, an area in which Spanish has a strong presence, which may contribute to developing unique features of the HS identity in language and L2 communities of practice that might not be as frequent in other parts of the country. A methodological limitation was not including a native speaker rater from Mexico who could have provided other insights on the language utilized by the participants. Future studies should include a larger pool of participants. Moreover, regarding L2 learners, a future study should assess their ability to spontaneously adapt their speech based on the context register.

Conclusion

Prior research has compared the linguistic skills of HSs and L2s, two populations that may experience incomplete learning of either the L1 or L2. This study explored Spanish HSs' and L2s' lexical choices during a formal exchange. In general, results suggest that L2s made better lexical choices than HSs. In taking an ecological approach to language learning, factors that afforded or constrained vocabulary learning associated with high register were discussed. Conclusions called for language-learning instruction that is founded upon an understanding of learners' unique language-learning histories.

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Appendix A

Rater's rubric

The purpose of this evaluation is for you to assess if the speaker knows how to use formal words when talking to somebody who is older, higher in status, and in a formal interview setting.

- Let's pretend participant _____ is invited to a series of functions. Would s/he be able to use language appropriately in all these functions or do you feel s/he would not be formal enough in some of them? (Please indicate your answer with X)

	The participant would do fine.	The speaker needs to learn how to be more formal.
Your friend's birthday		
Meeting with the Queen and King of Spain		
A private meeting with Mexico's president		
Talking to a CEO		
Dinner with your family		
Lunch with your coworkers		

- Please explain why (or why not) the speaker would be prepared to attend these functions. What is s/he lacking?
- Think about the kinds of words the participant uses in his/her conversation with Dr. M, and complete this table. Please give 2-3 examples of the participant's words that fit under those categories.

Everyday, common words
Colloquialisms (non-standard, words that identify the

speaker's place of origin)

Slang (very informal words, almost vulgar terms without being bad words)

English words (while speaking in Spanish)

Long words (as those usually found in literary works by important authors like Gabriel García Márquez)

Appendix B

HSs' speech tokens

Token	Davies's frequency
a	5
accidente	1098
acelerado	4633
ahí	139
ahorita	(ahora) 85
algo	101
automático	2984
autopista	4523
bien	73
bueno	226
cambio	186
carro	1871
coche	1131
como	16
con	13
creer	91
cuánto	723
de	2
definitivamente	1358
descomponer	4706
después	87
detrás	701
día	71
decir	28
dar	39
disculpa	4563
disculpar	4079
doctora	778
el	1
emergencia	3273
empezar	161
en	6
entonces	76
ser	8
especial	364
Esto	29
estar	17
fallar	1664
favor	468
gasolina	692

gracias	272
grúa	272
haber	11
hacer	11
historia	25
instrucciones	192
ir	1611
la	30
llevar	93
lo	20
luego	132
luz	256
manejar	916
me	35
mi	49
mí	357
muchas	45
muy	42
necesitar	229
no	10
número	315
o	25
otra	31
para	15
parar	1001
pasar	57
permiso	1753
pero	23
poder	428
por	12
preguntar	323
prestar	767
prisa	3253
problema	169
poder	428
pues	103
que	3
qué	47
querer	57
regreso	1557
repente	2183
repongo	3423
saber	1625
se	9
semana	304

L2s' speech tokens

Token	Davies's frequency
A	5
ahora	85
alguien	480
aquí	129
arriba	544
ayuda	594
ayudar	345
bien	73
bueno	226
carro	1871
claro	259
coche	1131
con	13
cuanto	213
de	2
decir	28
dejar	94
días	71
diez	364
doctor	778
dos	56
el	1
emergencia	3273
en	6
encendidas	2133
ser	8
eso	32
esta	29
está	17
favor	468
funcionar	692
gracias	6
gusto	593
hacer	25
hora	143
humildemente	2367
importante	207
ir	30
la	33
llave	2150
llegué	66

lo	20
lucos	256
lugar	135
mamá	2286
mañana	1235
más	24
me	35
mi	49
mil	217
minutos	456
muchas	45
muy	45
nada	95
necesitar	229
no	10
para	15
pedir	15
pero	23
poco	74
poder	428
por	12
posible	225
prestar	767
problema	169
pues	103
que	3
qué	47
querer	57
sí	70
servir	226
solamente	336
su	14
tal	120
techo	1386
tener	18
terminar	219
tiempo	68
tu	349
un	7
venir	105
volver	112
y	4
ya	36
yo	52

Hemispheric Lateralization of Words in Turkish-English Bilinguals and Turkish Monolinguals

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Abstract

It is well-established in the literature that language functions are controlled in the left hemisphere in the majority of right-handed people. However, contradictory results have been obtained in the bilingual laterality literature. This study aims to investigate how lexical processing is represented in monolinguals and bilinguals. Two groups of participants performed a lexical decision task. The first group comprised of Turkish-English bilinguals (N= 48) who acquired both languages from birth. In the second group, there were Turkish monolingual speakers (N= 53). The participants were instructed to decide if the words presented in the right or left visual field were real words or non-words. The results showed that lexical processing is left-lateralized in monolinguals. For bilinguals, on the other hand, it was bilaterally presented.

Keywords

Lateralization, monolingual word processing, bilingualism, psycholinguistics

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Since the publication of seminal papers by Broca and Wernicke in the 19th century which showed that the left hemisphere of the brain was specialized for language processing, there has been a great deal of research that supported this view. Imaging literature abounds with evidence that the left Planum Temporale, known as the Wernicke's area, is relatively bigger than its counterpart in the right hemisphere (Lieberman, 2002; Toga & Thompson, 2003; Frost et al., 1999; Hellige, 2001; Hugdahl, 2005). Similarly, dichotic listening tasks have revealed that stimuli presented to the right ear are processed faster than those presented to the left, which is evidence for left hemispheric superiority in processing verbal stimuli (Hugdahl, 2005). Further support comes from hemifield studies investigating lexical processing (Babkoff, Faust & Lavidor, 1997; Jordan, Patching & Milner, 2000). Deason and Marsolek (2005) reported that the mental lexicon was in the left hemisphere, where abstract word representations are located, explaining why this hemisphere is better at processing words. Also, the superior performance of the left hemisphere in lexical processing has been associated with its parallel processing capacity which enables it to deal with letter strings as whole units, unlike the right hemisphere, which processes them separately (Babkoff, Faust & Lavidor, 1997).

Despite the increased number of studies in the monolingual literature supporting the left hemisphere dominance in lexical processing, there is controversy over how language processing is lateralized in the bilingual brain. According to Hull and Vaid (2005), conflicting outcomes of the studies are due to variability in the language experience of the participants, the methods and the linguistic tasks used. Similarly, Paradis (2004) claimed that the methods used in laterality studies were either flawed or totally ignored individualistic differences among the participants. Another problem with such methods was that they were unnatural, and failed to tap into speech production and comprehension skills (Paradis, 2004).

Despite the lack of consensus in the literature, the existing research indicates greater involvement of the right hemisphere in language tasks in bilinguals (Hull & Vaid, 2006, 2007; Peng & Wang, 2011; Park, Badzakova-Trajkov & Waldie, 2012). Bilateral hemispheric lateralization is more common in the case of simultaneous acquisition of both languages (Hull & Vaid, 2005, 2006, 2007). This is thought to result from the right hemisphere's dominant role in language control in simultaneous bilinguals, due to the need to keep their two languages separate since childhood (Hull & Vaid, 2007).

Visual hemifield studies have provided experimental support for bilateral hemispheric organization in bilinguals. For example, an fMRI study by Park, Badzakova-Trajkov and Waldie (2012) supported bilateral organization of both languages of proficient speakers of Macedonian and English. However, Workman, Brookman, Mayer, Rees & Bellin (2000) reported contradictory results for Welsh-English bilinguals, finding that the left hemisphere was dominant in language processing, particularly in Welsh. This result was attributed to relatively shallower orthography of the Welsh language. The authors maintained that Welsh depends more on phonetic processing compared to English, which has deeper orthography. Hull and Vaid (2006) reported in their meta-analytic study that different methods yielded different results in the literature maintaining that the types of tasks used in the studies may possibly account for the lack of solid evidence in the bilingual laterality literature. For example, studies using dichotic listening tasks reported left hemisphere dominance, especially in late learners.

Methods

Participants

There were two groups of participants. In the first group, there were simultaneous bilinguals who acquired both languages from birth (N= 48, 15 male, 33 female, Mean age= 29.75, *SD*= 9.64). They were chosen among candidates who had been residing in Turkey for the last ten years and were right-handed as assessed by the *Edinburgh Handedness Inventory* (Oldfield, 1971). The participants self-assessed their language proficiency in Turkish and English on a five-point scale and an analysis of the assessment yielded no significant differences between their languages in terms of four language skills, $\chi^2 = 5.21$, *sd* = 3, *p*= .157 > .05.

The second group of participants were Turkish monolingual speakers (N= 53, 17 male, 36 female, Mean age= 28.25, *SD*= 7.32). They were all right-handed as assessed by the *Edinburgh Handedness Inventory* (Oldfield, 1971).

Instruments

A lexical decision task was used. The participants were seated 40 cm away from a lap top computer using a chin rest. Following a warning sound, a cross emerged in the center and stayed

on the screen for 1000 ms. Then, the target word appeared either from the right or the left of the fixation point for 200 ms. The stimuli were presented vertically at a 2-degree angle from the right or left of the screen in a random order. Finally, a mask appeared to prevent any afterimage. The participants were instructed to decide if the visually presented letter strings were real words or non-words, and press on the designated keys with their right hand as fast as possible. Their reaction times and the accuracy of the answers were recorded via SuperLab 4.0 software program.

Stimuli

Two sets of stimuli were used. In the Turkish set, there were 30 real words and 30 non-words. The real words were chosen from a pool of 300 words from *Yazılı Türkçe'nin Kelime Sıklığı Sözlüğü* (Göz, 2003). The words were rated by hundred Turkish native speakers according to their valence, frequency of use and degree of arousal on a 5-point Likert Scale. Out of this pool, 10 positive, 10 negative and 10 neutral words were selected. No significant differences were found in terms of frequency of use, ($F_{2,27} = 0.83$, $p > .05$, $\eta^2 = .058$). However, they differed significantly in terms of valence, ($F_{2,27} = 98.01$, $p < .001$, $\eta^2 = .879$). Non-words were created by exchanging the initial letters and final letters, and they all complied with the phonotactic rules of Turkish. Similarly, the English set were formed from a pool of 300 words selected from *Affective Norms for English Words* (Bradley & Lang, 1999). Based on the ratings collected from 30 English native speakers, 10 positive, 10 negative and 10 neutral words were selected for the English set. 30 non-words were formed by changing one letter of English real words.

Results

A paired-samples *t*-test was performed to analyse the response time data. RT's below 250 ms and those above 1800 ms were discarded from the analysis. The analysis was performed on 96 % of the positive words, 96 % of the negative words, 94 % of the neutral words and 93 % of the non-words. After the elimination of the outliers in the RT data, there was an uneven distribution of the total number of the accurate responses of real words and non-words across participants. Therefore, these totals were calculated for each participant by dividing the total number of correct responses by the total number of words and non-words presented. A Wilcoxon test was conducted on the data.

Table 1 shows the results pertaining to the response times of Turkish and English words presented to each visual hemifield.

Table 1. Response Times for Turkish and English words presented to the right and left visual fields

Turkish Words						English Words				
	Mean (ms) RVF	Mean (ms) LVF	Std		* <i>p</i>	Mean (ms) RVF	Mean (ms) LVF	Std		* <i>p</i>
Positive Words	728.04	662.97	203.37	2.217	.032	673.11	674.36	201.58	-.043	.966
Negative Words	776.45	716.78	11.41	1.956	.056	763.74	749.75	180.12	.538	.593
Neutral Words	739.46	733.65	25.89	.178	.859	723.74	678.82	148.56	2.095	.042
Nonwords	894.17	869.29	27.09	1.356	.182	860.63	859.93	126.19	.038	.969

**p* > .00625 (*p* value has been adjusted by dividing .05 by the number of pair-wise comparisons, 8 in this case)

Table 1 shows the reaction times for Turkish and English words presented to the right (LH) and the left visual fields (RH). No significant differences were found between the Turkish words according to visual fields (*p* > .00625). English words revealed the same results. This shows that there is clear evidence for bilateral processing in bilinguals.

A Wilcoxon test was performed on the accuracy rates of Turkish and English words presented to the right or left visual fields and the results are given in Table 2.

Table 1. Accuracy Rates for Turkish and English words presented to the right and left visual fields

Turkish Words							English Words						
	ean(%)	td	ean(%)	td		*	ean(%)	td	ean(%)	td		*	
	VF		VF				VF		VF				
Positive Words ^P	1	19	2	24	.502	603	1	17	6	18	1.295	195	
Negative Words ^N	9	19	0	18	.514	608	3	20	5	20	.928	353	
Neutral Words ^N	9	22	4	19	1.124	261	0	18	8	20	2.459	014	
Nonwords ^N	7	11	4	12	1.474	140	8	07	5	09	1.936	053	

**p* > .00625 (*p* value has been adjusted by dividing .05 by the number of pair-wise comparisons, 8 in this case)

A Wilcoxon test performed on the accuracy data revealed no significant difference between the Turkish words presented to the right (LH) or the left visual field (RH) ($p > .00625$). Similarly, there was no significant difference between the English words presented to the right (LH) or the left visual field (RH), which shows that lexical processing is bilaterally represented in bilinguals. A paired-samples t -test was performed on the response time data of the monolingual participants. The results are given in Table 3.

Table 2. Response Times for Turkish words presented to the right and left visual fields

	N	Mean (ms) RVF	Mean (ms) LVF	Ortanca	St. Sapma	t	p
Positive Words	53	459.39	522.73	-63.34	71.22	-6.475	.000*
Negative Words	53	538.06	594.54	-56.48	72.70	-5.656	.000*
Neutral Words	53	519.33	577.28	-57.95	99.03	-4.260	.000*
Nonwords	53	641.03	671.49	-30.45	52.73	-4.204	.000*

* $p < .0125$ (p value has been adjusted by dividing .05 by the number of pair-wise comparisons, 4 in this case)

Table 3 shows the results of monolingual participants' response times to Turkish words, revealing that words presented to the right visual field (LH) have shorter reaction times than those presented to the left visual field (RH). This difference is statistically significant ($p < .0125$), supporting the view that lexical processing in monolingual participants is left-lateralized.

A Wilcoxon test was performed on the accuracy data obtained from monolingual participants and the results are given in Table 4.

Table 4. Accuracy Rates for Turkish words presented to the right and left visual fields

	N	RVF		LVF		Z	p^*
		Mean (%)	Std	Mean (%)	Std		
Positive Words	3	87	.18	90	.14	-.746	456
Negative Words	3	84	.19	82	.18	-.371	711
Neutral Words	3	82	.19	80	.21	-.671	502
Nonwords	3	61	.21	61	.21	-.206	837

* $p > .0125$ (p value has been adjusted by dividing .05 by the number of pair-wise comparisons, 8 in this case)

A Wilcoxon test revealed no statistically significant difference between the accuracy rates of the participants' responses to Turkish words presented to either visual field ($p > .0125$). This result shows that monolingual speakers of Turkish perceive Turkish words similarly in both hemispheres.

Discussion

This study investigated brain lateralization of lexical processing in Turkish-English bilinguals and Turkish monolinguals. As revealed by the analysis of reaction time data, there was no significant difference between the speed with which the bilingual participants processed words presented to the right (LH) and left visual fields (RH), suggesting that lexical processing is bilaterally represented in bilinguals. Similarly, accuracy data revealed no difference when both Turkish and English words were presented to either visual field, adding support to bilateral organization in bilinguals.

Converging evidence in the literature has shown less hemispheric asymmetry in language processing in bilinguals as compared to monolinguals. This has been associated with language control in bilinguals, i.e. the need from birth to decide which language is appropriate in each context, and thus keep languages separate. This accounts for greater right hemisphere involvement in bilinguals, particularly in the case of simultaneous acquisition of both languages, as this hemisphere is considered to be responsible for such tasks (Hull & Vaid, 2007; Park, Badzakova-Trajkov & Waldie, 2012).

The view that simultaneous/early-acquired languages processing is different from monolingual language processing is based on the idea that the bilingual language acquisition process is monitored by cognitive resources and strategies different from those used in monolingual language acquisition. Bialystok (2001), for example, holds that language acquisition is inseparable from cognitive processing. Bilinguals inhibit one language while producing the other, or alternate between languages when the need arises, which requires bilinguals to employ strategies different from those used by monolinguals. It has been reported that bilinguals outperform monolinguals in cognitive tasks (Bialystok, Craik & Luk, 2008); bilinguals' enhanced mental flexibility has been associated with the greater involvement needed

in their language tasks. For example, Tao, Marzecova, Marcus, Asanowicz & Wodniecka (2011) reported that bilinguals performed better in nonverbal IQ tests, attention and orientation tasks, as well as in executive functions, due to their efforts in controlling their languages since birth.

An analysis of the monolinguals' data revealed that words presented to the right visual field (LH) were processed faster than those presented to the left visual field (RH). The difference found was significant, suggesting left hemisphere superiority in language processing in monolinguals. This result replicates the widely-accepted view in the monolingual literature.

The results obtained from the analysis of the monolingual participants' RT's were in line with the prevalent view in the literature, suggesting that the left hemisphere is primarily responsible for monolingual language processing. As shown in the laterality literature (Frost et al., 1999; Hellige, 2001; Lieberman, 2002; Toga & Thompson, 2003; Hugdahl, 2005), the left hemispheric specialization in processing language is attributed to the neuroarchitecture of this hemisphere needing to keep pace with the temporal aspects of language processing, which proceeds in milliseconds (Jung-Beeman, 2005; Nalçacı, 2010). Another line of evidence has shown left hemispheric dominance, particularly in lexical processing. Deason and Marsolek (2005) reported that the mental lexicon is situated in the left hemisphere. The Babkoff, Faust and Lavidor (1997) study showed that the left hemisphere can process long streams of linguistic units as wholes, confirming the important role of the left hemisphere in lexical processing. Similarly, Lavidor and Ellis (2002) reported that the left hemisphere is less vulnerable to confounding factors such as word length and orthographic neighbors as compared to the right hemisphere.

The imaging literature has also provided supplementary evidence for left hemisphere dominance in linguistic tasks, particularly in word recognition. Activation in the fusiform gyrus (BA 47) in the left occipitotemporal lobe has been reported in a number of studies (Dehaene, Le Clec'H, Poline, Le Bihan, & Cohen, 2002; McCandliss, Cohen & Dehaene, 2003). Similarly, ERP studies reported more activation in the area relative to the right hemisphere, adding more support to the view that the left hemisphere has priority in lexical processing (Barber & Kutas, 2007).

When the accuracy of the monolingual participants's responses to words were analysed, however, no significant difference was found between the visual fields the words were presented to. This result can be explained by what is known as *accuracy-response time tradeoff* in the literature, according to which participants may favor speed at the expense of accuracy, or vice

versa (Bogacz, Wagenmakers, Forstmann, & Nieuwenhuis). In our study, the monolingual participants may have focused on giving quick responses to words presented to the right visual field, failing to respond as accurately compared to those presented to the left. This, in turn, led to equal accuracy for words presented to either field.

Conclusion

In this study we investigated hemispheric lateralization of words in bilinguals and monolinguals. We found no difference in bilinguals' performance of processing words presented to either visual field, suggesting that both hemispheres are equally involved in lexical processing. These results provided further support for the dominant view in the literature that language processing is bilaterally represented in bilinguals. Also, the monolingual participants in our study responded faster to words presented to the right visual field. These results showed that lexical processing in monolinguals is left-lateralized, in line with the monolingual lateralization literature. Monolingual participants' accuracy rates for words presented in either visual field, on the other hand, were comparable. This may be due to the participants' choice for favoring speed at the expense of accuracy, which is the case in lexical decision tasks. The bilingual participants in our study acquired Turkish and English simultaneously; future studies may investigate whether these results are replicated with late learners of either language. It would also be interesting to repeat the research using an auditory rather than a visual task.

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Juggling Two Languages: Malay-English Bilinguals' Code-switching Behavior in Singapore

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Abstract

This paper investigates the frequency and functions of code-switching in the bilingual Malay-English community in Singapore. In this paper, recorded conversations between Malay-English bilinguals were analyzed both qualitatively and quantitatively. Code-switching has been thought of as a messy misappropriation of the language, especially in the Singaporean context where accuracy of language use is held in high regard. However, the recorded conversations show that code-switching is utilized strategically by Singaporean Malay bilingual speakers. It is observed that code-switching patterns differ inter-generationally and the linguistic choices made during code-switching by the younger speakers contrast distinctively with those of the older speakers. Since the Malays constitute the second-largest ethnic group in Singapore, insights on their code-switching patterns are relevant and timely in understanding an inherent language practice that reflects the community's relationship with their language while simultaneously navigating through an English-dominant country. Finally, this paper argues that code-switching is a communication tool undertaken by bilingual speakers during conversations with specific functions and regular frequency, and not a sign of linguistic incompetence.

Keywords

Codeswitching, Malay, Singapore, Bilingualism

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The Impurity of Mixing Languages

In 1982, Singapore's Malay Language Council, an organisation sanctioned by the Singapore government, launched the Malay Language Month. This was to be the first of such subsequent language campaigns in later years, the aim of which was to implement and celebrate efforts to speak 'proper' Malay. One of the reasons behind the campaign was, according to the council, to stop the Malay speakers' free mixing of words, perceived to be "polluting" the language, and feared to result in the deterioration and degeneration of the Malay language if left unchecked. The Malay Language Month, therefore, was designed to "arrest further deterioration of the Malay Language which could turn into a patois – a kind of pidgin worse than what we now know as "bazaar Malay"" (Fong, 1982).

This mixing of languages, what linguists would refer to as "code-switching", is a common and natural phenomenon. Code-switching is particularly prevalent in multilingual societies, and has been well-recorded and studied in multilingual nations around the world, including Southeast Asian states such as the Philippines (Bernardo, 2005; Sibayan, 1985) and Malaysia (Kow, 2003; Muthusamy, 2009). Unfortunately, code-switching has also often been seen in political spheres and by language purists as a bastardization of the pure and traditional language (Gumperz, 1982), and in Singapore, also thought to be used by speakers "for the sake of convenience" (Fong, 1982). But code-switching is "not a haphazard mixing of two languages brought about by laziness or ignorance" (Wardhaugh, 2010, p. 107). Code-switching is a linguistic tool utilized to achieve various communicative objectives. Studies have shown that code-switching is employed to assert authority (David, 2003; Halim & Maros, 2014), to express tense, aspect or mood (Pfaff, 1979), as a personal marker of identity (Fuller, 2007; Gumperz, 1982) or class and group affiliation (Fought, 2003), to begin or strengthen relationships, to explain a lexical term (David, Hei, McLellan, & Hashim, 2009), and to display upward social mobility (Gardner-Chloros, 2009), amongst many other functions.

There has been extensive research on code-switching amongst bilingual speakers of a large number of languages. Studies have looked at code-mixing in Spanish-English bilinguals (Toribio, 2002), code-switching frequencies in French-English Canadians (Poplack, 1987), group and class markers amongst Chicano-English speakers (Fought, 2003), online code-switching in Greek-Cypriot speakers (Themistocleous, 2015), and across many countries (see e.g. Heller, 1988; Jacobson, 2001). In Singapore, there have also been studies on code-switching, though

most have been focused on the code-switching patterns in the Singaporean Chinese community. For example, Tay (1989) analyzed how code-switching and code-mixing using English, Mandarin, Hokkien, and Teochew served as a communicative strategy for elucidation and interpretation and to establish rapport and solidarity between speakers in a multilingual discourse. Kamwangamalu and Lee (1991) explored whether a matrix language existed in the code-mixed utterances spoken by Chinese-English bilinguals in Singapore. In the most recent work on this topic, albeit a good 15 years ago, Lee (2003) looked at the motivations of code-switching in Chinese-English bilinguals in Singapore.

Even though the Malay community may be one of Singapore's three major ethnic groups and there is a substantial community of Malay-English bilinguals in Singapore, there has not been a study on Malay-English code-switching in Singapore specifically looking at the functions and purpose of its usage in interactional discourse. Most studies on code-switching in Malay-English bilinguals have, in fact, been primarily conducted in Malaysia, Brunei and Indonesia. In this paper, we seek to analyze and understand the code-switching patterns of Malay-English bilinguals in Singapore. By looking at the code-switching patterns of participants from two different generations, we specifically seek to unveil how speakers use code-switching as a language practice to affect communication. We do this by providing a quantitative analysis of code-switching frequency and also a qualitative analysis of the functions and motivations of code-switching in these speakers.

What is Code-switching?

The topic of code-switching as a scholarly study gained traction in the 1970s. Since then, it has been a subject of interest to scholars who have examined it from different theoretical or grammatical perspectives, methodologies, and across languages. Depending on the approach to the topic, code-switching has also been subjected to a range of definitions. Early scholars' definitions of code-switching were concerned with what constituted different codes. Bell (1976), for example, defined code-switching as a tool that "allows its user to be seen as a chooser amongst codes whether the codes are styles, dialects or what are normally thought of as autonomous languages since any or all of these can be involved in the code-switching behavior of the language user" (p. 110). Hudson (1980), while following the definition, also included different varieties of the same language as different codes. Blom and Gumperz (1972) framed code-switching as an alternation of languages that acts as an interactional tool with social

functions and speakers can choose to switch codes when there is a change in topic or when there is a change in their perception of the other interlocutor. These early definitions tried to capture code-switching as a form of bilingual behavior which could inform us of a universal linguistic structure. These definitions also tried to fit code-switching patterns into specific taxonomies bound by strict linguistic systems. However, in reality, the boundaries between codes are not clear and there is no clear line that can show one language switching to another (Heller, 2007).

Over the years, other scholars have tried to provide a more precise definition and description of code-switching, which inadvertently becomes confusing as they try to segment discourse into distinct turn-taking moments. The main point of contention is the distinction between *code-switching* and *code-mixing*. In general, scholars agree broadly that code-switching refers to the alternation between languages, while maintaining the grammatical characteristics unique to each language. Code-mixing, on the other hand, refers to situations where there is convergence between the two languages, such as the adoption of suffixes, or other inflectional or lexical morphemes. However, the segregation of these two creates confusion because often, these two processes occur jointly during the span of discourse (Gardner-Chloros, 2009; Hamers & Blanc, 2000). Hence, the concept of code-switching has been largely understood under the general term of the alternation of two or more languages in the same conversation, where switching can occur between turns of different speakers during the conversation, between utterances in a single turn, or within a single utterance, and codes can also include different varieties of the same language (Gardner-Chloros, 2009; Milroy & Muysken, 1995; Myers-Scotton, 1993). In this paper, we take the above as the working definition of code-switching that underlies the analyses that we carry out. We hold the belief that discourse is fluid and not rigid or formulaic in nature, and thus, code-switching during conversations is not restricted to rigid turn-taking moments.

Gumperz (1971) is one of the first scholars who shifted the focus from defining codes in code-switching to thinking about code-switching as an interactive tool used by bilinguals. More importantly, as Gumperz (1982) highlighted, code-switching functions roughly the same way across different language situations. Past research on bilingual speech behavior has in fact revealed that there are regularities in the ways that bilinguals switch codes (e.g. Gumperz, 1971; Jurgens, 2015; Pfaff, 1979; Poplack, 1987; Themistocleus, 2015). Poplack's (1987) comparison of two English bilingual communities, for example, shows similar categorical functions of code-

switching use during discourse. Furthermore, Poplack's (1980) study on Spanish-English speakers reveals that code-switching forms an integral part of the community's linguistic behavior. It is also observed that bilingual speakers frequently code-switch intra-sententially, with sequential fragments of alternate languages that are grammatical to the language of origin (Poplack, 1980, 1987). This ensures the linear coherence of sentence structure of the speaker, without omitting content. This has also been observed in a variety of bilingual communities, for example, Finnish-English (Poplack, 1987) and Tamil-English (Sankoff, Poplack, & Vanniarajan, 1990), where speakers show a general tendency to switch codes intra-sententially.

Gumperz (1982) also developed a taxonomy that has helped shape future discussions of code-switching in discourse. Blom and Gumperz (1972) further formulated a typology that distinguished between situational and metaphorical code-switching. This distinction helped account for the ways in which domains contribute to a bilingual's language use, and explain the ways in which bilinguals utilize their linguistic resources based on domains. Since then, there have been an increasing number of code-switching studies that define it as a conversational strategy with distinct functions (e.g. Auer, 1984; Myers-Scotton, 1993; Zentella, 1997). Myers-Scotton (1993), for example, has shown how code-switching is a way for multilingual speakers to index social relationships and which offers users flexibility in expression through the languages employed. Similarly, Gumperz (1982) discussed code-switching as a strategy and a personalization function in which users can switch codes to manipulate the conversation or create a desired meaning. In addition, speakers can also switch between languages depending on the context, conversational participants, and linguistic situations. Gumperz's (1982) typology of code-switching functions has since been continuously expanded and supplemented by other studies, and now includes functions such as persuasion, reiteration, or message qualification (e.g. Kow, 2003; Poplack, 1980, 1987).

The most recent expansion of the typology can be seen in Halim and Maros' (2014) study on the functions of code-switching in Malaysian Malay-speaking youths. In this study, Malaysian youths were found to employ code-switching skills as strategies to assert their identity, express their membership in a particular group, or represent the society's current dominant language in both oral and written discourse. There have also been a number of studies on the functions of code-switching in Malay across different domains, both informal and formal. David's (2003) study on code-switching in Malaysian courtrooms showed that even in such

formal domains, code-switching has become a habitual practice. The study noted that speakers code-switched strategically, for situational reasons, depending on their interlocutor, or to emphasize a point in their argument. In another study also using a typology of code-switching functions, Kow (2003) focused on pre-schoolers in the classrooms of Malaysia. Kow observed that even pre-schoolers can and will code-switch to fulfill different communicative functions. Kow (2003) listed some of the discourse functions that code-switching can fulfill, further expanding on the list of functions as mentioned earlier. Some of these functions are: compensating for the lack of a lexical term in one language, clarifying a misunderstanding, creating a communication effect, emphasizing a point, expressing group solidarity, or even excluding a person from the conversation. Code-switching can therefore be seen to provide its speakers with an innovative strategy during communication to fulfill or achieve certain nuanced communicative goals.

While past research on Malay-English code-switching, such as that mentioned above, has come up with a list of code-switching functions, little has been done to show how frequently these functions are employed. For instance, David et al. (2009) focused on the functions of code-switching in the family domain amongst Malay-English bilinguals in Malaysia while Ariffin and Husin (2011) looked at the attitudes and frequency of the phenomenon in classrooms. In Brunei, Martin (1996, 2005) investigated the language shift and code-switching amongst the Belait community and showed how code-switching happens in the classroom. Code-switching in Indonesia, on the other hand, has been investigated in relation to region and tribal languages (e.g. Goebel, 2002; Sumarsih, Bahri, & Sanjaya, 2014; Supiani, 2016).

As shown above, studies have been done on code-switching by Malay speakers in Malaysia, Brunei, and Indonesia, but there has been comparatively little research looking at code-switching in the Malay community in Singapore. A small number of studies have shown that the Singaporean Malay community engages in code-switching at home and, increasingly, on social media platforms as well. For instance, Soon et al. (2014) observed that there was a predominance of code-switching in blog entries of the Malay community, covering a medley of different topics. According to this study, bloggers who blogged in Malay were compelled to code-switch because it was assumed that their readers would be more comfortable with the dual-language style, and also in part due to their lack of competency in some particular lexical domains. In another study looking at how code-switching happens in the Islamic religious

classrooms in Singapore, Ong and Chew (2013), showed how code-switching is used as a tool to clarify instructions by capitalizing on the common language between students and teachers. While Singapore's Malay community may be perceived to be similar to those in Malay-speaking nations mentioned above, one must note that Singapore has very different language policies and educational systems from other Malay-dominant nations such as Malaysia, Brunei, and Indonesia. Sociolinguistically, Singapore's Malay community has also been reported to be experiencing a language shift from Malay to English, especially amongst youths (see Cavallaro & Serwe, 2010; Chong & Seilhamer, 2014). The biggest difference in Singapore lies in the premium placed on the English language that affords its speakers and anyone proficient in it to have social mobility in Singapore. The lingua franca and working language of Singapore is also English, unlike her neighboring Malay-speaking nations. It is therefore likely that code-switching patterns of the Malay-English bilinguals in Singapore would differ from those in countries like Malaysia, Brunei and Indonesia.

This paper will analyze the code-switching data based on an adapted version of the typology of functions provided by Poplack (1980) and Kow (2003), together with the quantitative approach put forth by Poplack (1987). However, these functions will be adapted to suit the data set collected from the Singaporean Malay-English bilingual speakers.

Methodology

In order to examine the frequency of code-switching in Singapore's English-Malay community, approximately four hours of spontaneous conversations were recorded. An exhaustive examination of their code-switching functions was performed qualitatively, and tabulated according to these functions. The quantitative analysis of the functions of code-switching was adopted from Poplack (1987), and adapted according to the data. These functions have been counted and tabulated for the frequency of their occurrences in the conversations.

Participants

A total of twenty participants took part in the study and were divided into two different age groups. All participants involved in the study were Singaporeans who were Malay-English bilinguals and had at least 12 years of formal education. Ten participants engaged in the study were between the ages of 20 and 29 and the other ten were aged between 50 and 69. Participants were grouped with three or four people from the same age group to participate in a group

conversation. The conversations were then recorded and transcribed. The reasoning behind the separation of generations is that previous studies have shown that despite previous descriptions of Malay as a language resilient to language shift in Singapore's community (Stroud, 2007), Cavallaro and Serwe (2010) noted that English use among Malay Singaporeans has in fact been steadily increasing at home. The percentage of English as a home language for Malays has more than doubled from 1990 to 2005. Chong and Seilhamer (2014), in their paper, found that Malay participants aged 18 and 26 self-reported to be using English predominantly in their everyday activities. What is particularly pertinent, as observed by Cavallaro and Serwe (2010), is that Malay speakers alter their language choices according to the interlocutor. Generally, when speaking to someone older, the Malay language would be used more frequently than when speaking with siblings. In this regard, it becomes important to also look into possible differences between participants of different age groups.

Participants were solicited via the authors' social network, and respondents participating in the same conversation were in the same social network as well. All the participants were reported to speak Malay at home. While the older participants had different educational backgrounds and levels, the younger participants consisted of four working professionals and six undergraduates. The recorded conversations were held in public spaces such as cafés and restaurants and once at home, usually over a meal. Participants were instructed to hold their conversations as normally as possible and were not told which language to use. Each conversation lasted an average of 40 minutes. Conversational topics were left to the participants to decide and they ranged from personal stories to discussions of social issues. Each conversation was then transcribed and analyzed (see Appendix A for a short transcription of the old Malay speakers' conversations, and Appendix B for the young Malay speakers' conversations).

The analysis that follows will discuss, in order of frequency, the functions of code-switching in the Singaporean Malay-English bilinguals. Additionally, the analysis will also provide a generational comparison between the young and old speakers so as to ascertain if there is a difference between the two groups of speakers.

Analysis

Table 1 below shows the frequency of the code-switching functions in the young and old Malay-English bilinguals.

Table 1. Frequency of functions of code-switching in the young and old Malay-English bilinguals in Singapore

	YOUNG	OLD
<i>Functions of code-switching</i>	%	%
<i>Grammatical categories</i>	12.7	16.4
<i>Seeking affirmation, clarification</i>	15.4	8.2
<i>Topic/domain association</i>	11.4	11.6
<i>Create a communication effect</i>	14.0	7.6
<i>Practicality</i>	8.3	11.3
<i>Proper names</i>	6.1	12.4
<i>Repetition, translation, explanation</i>	8.3	9.6
<i>Expression</i>	10.1	5.5
<i>Temporal categories</i>	4.0	5.5
<i>Terms of affiliation</i>	6.1	2.4
<i>Reported speech</i>	2.6	1.4
<i>Acquired terms</i>	0	3.1

From Table 1, it is clear that there were no distinct similarities in the patterns of code-switching functions for both generations. Both groups had their own unique patterns of code-switching, and did not favor one choice prominently over the others. The older generation code-switched the most in grammatical categories, and when using proper names. The young participants, on the other hand, tended to switch codes more frequently when seeking affirmation, clarification and when they intended to create a certain communication effect (at 15.4% compared to 8.2%). Interestingly, code-switching for acquired terms was almost non-existent amongst young speakers, while it was in fact employed by the old speakers. Another interesting point to note is that both generations switched codes at nearly the same frequency when associating with a certain topic or domain. These will be discussed in more detail in the later sections.

Table 2. Syntactical occurrences of code-switching

		YOUNG	OLD
		%	%
<i>Intra-sentential</i>		81.3	80.5
<i>Sentential</i>		11.1	14.7
<i>At turn boundary</i>		7.6	4.9

There was also no discernible difference in the syntactic locations of code-switching between the two groups of speakers. As can be seen from Table 2, more than 80% of code-switching for both groups occurred intra-sententially. It is important to note that these occurrences were fluently executed, with a smooth transition from one language to another. These intra-sentential switches were not flagged by false starts, hesitations or lengthy pauses, and appeared to be indicative of the speakers' highly developed linguistic skill in both languages.

Perhaps the most striking observation drawn from the analyzed recorded conversations is the difference in code-switching direction between generations. The speakers from the older generation tended to code-switch into English, while maintaining large parts of their conversation in Malay. For the participants in the younger generation however, most of their conversations were conducted in English, and code-switching was done in Malay. This pattern can be seen in the examples provided in the section below⁸. The following section will be organized according to the highest combined percentage of code-switches.

Grammatical categories. In this category, code-switching is used to substitute grammatical functions such as intensifiers, conjunctions, possessive forms, fillers or prepositional terms of one language with those of another.

- | | |
|------------|---|
| (1) | I saw one, <u>yang</u> mulia jay is it? |
| Farah(YNG) | I saw one, CONJ mulia jay is it? |
| (2) | |
| | Then <u>yang Nabilah punya</u> is what? |
| Maria(YNG) | Then CONJ Nabilah POSS is what? |
| (3) | |
| | Termasuk kad semua. <u>Then</u> dier ader kek, berkat la. |
| Rosa(OLD) | Inclusive of cards everything. Then they have cake, door gifts too. |
| (4) | |
| | Udang penyet takde, takde <u>that one</u> ah? |
| Musa(OLD) | Udang penyet don't have <i>that one</i> ah? |

⁸ The conversational transcripts are taken from different speakers. Speakers are given pseudonyms and labelled "YNG" to refer to speakers of the younger generation, while "OLD" refers to the speakers from the older generation. The actual transcript is in bold, with the English gloss directly below it.

As can be seen from the data above, grammatical category code-switching does not fulfill any conversational goal for the speaker and can be done on the phrasal level (e.g. in (2)) or at the word level (e.g. (1) and (4)). The grammatical substitution does not negate the statement's meaning and when applied wrongly, can render the sentence grammatically incorrect. This is evidence that while code-switching is spontaneous, it also plays a grammatical function in bilinguals' conversations. It is also consistent with Poplack's (1980, 1987) study on Spanish-English and French-English speakers. In Poplack's work, bilingual speakers switched seamlessly between languages and were seemingly unaware of the switch. Furthermore, the switched item or phrases fit grammatically into the utterance, and if used differently, would make the sentence grammatically unsound.

Seeking affirmation/clarification. This category refers to code-switching instances that provide emphasis so as to seek affirmation or clarification. In (5), the speaker switched from English to Malay in order to clarify her question which was previously misunderstood.

- (5) **No, no but *dorang berbual pasal ape?***
 Mary(YNG) No, no, but what did they talk about?

In (6), the speaker uses English primarily, but uses “tau” and “kan” in Malay as affirmation markers.

- (6) **It is. She's like trying to get the numbers down la, 10 sets tau!**
 Mary(YNG) **That's a lot kan?**
 It is. She's like trying to get the numbers down DISC PART, 10
 sets did you know! That's a lot right?

The same happens with the Malay speakers from the older generation. The transcript in (7) shows the older Malay speaker switching from Malay to English for the purpose of clarifying her statement by giving more information about the venue of the reception.

- (7) **Er *atas, atas, atas*. Eh sorry, *jemputan atas*. But it's here also,**
 Aish(OLD) **and that side.**

Er, (it's) upstairs, upstairs, upstairs. Eh sorry, the reception is upstairs. But it's here also, and that side.

Topic/domain association. Topic/domain association refers to the language switch speakers make when they speak about a specific topic or domain. A notable feature from the data (see Table 1) is the close similarity, both at approximately 11%, in both groups' tendency to switch when they associated a language with a topic or domain, most prominently when it came to religion and technology. It is important to note that code-switching happened topically, and did not pertain only to specific religious or technological terms. This is better illustrated in the examples that follow.

- (8) **Eh, do you guys like run in your tudung? Like exercise?**
Maria(YNG) Eh, do you guys like run in your *hijab*? Like exercise?
- (9) **HAHA So no, they send, they actually send the niat there at the Whatsapp group.**
Jane(YNG) HAHA So no, they send, they actually send the “intention” there at the Whatsapp group.
- Mary(YNG) **Like the doa la?**
Like the prayer DISC PART?
Ya. Ni, niat mencari ilmu dari mengajar=
- Jane(YNG) Ya. This, “intention” is to receive knowledge from lessons=
So you kene bace?
- Mary(YNG) So you have to read?
- (10) **OH MY GOD! We have like DOA sebelum mengajar, doa selepas mengajar and then doa – biler time with the students. Like when the class starts, we have to read.**
Jane(YNG) OH MY GOD! We have like prayers before teaching, prayers after teaching and then prayers – during time with the students. Like when the class starts, we have to read.

In the examples above, the young Malay speakers switched to Malay when they referred to religious terms such as “prayers”, terms with religious connotations (as in (9)), and the Muslim woman’s headscarf. In (8), Maria(YNG) switched to Malay to refer to a Muslim headscarf, or commonly known as “hijab”. Similarly in (9), Jane(YNG) code-switched to the Malay term “niat”. The term “niat” can be loosely translated to having sincere and holy intentions, and it is a word that is sometimes used in a prayer. However, we see that code-switching went beyond word-only substitutions as they also occurred at the phrasal level. This is exemplified in (9) and (10) where speakers switched to Malay despite having the English equivalents to the terms.

Code-switching here serves to illustrate certain concepts in Islam whose purpose will not be better served if they are translated into English. This is perhaps not surprising, given the relationship between Islam and the Malay language in Singapore. In Singapore, the Malays are primarily Muslims, and those who are not would most likely still be familiar with Islamic religious rules, contexts, and terms. The current consensus still holds Malay Muslims to be a monolithic category and there is no clear division between religion and ethnicity. In fact, this definition and categorization of Malay-Muslims was first recorded by the British in British Malaya, and it was said that the most important aspect of a Malay is that he/she had to be Muslim (Khoo, 2006). As a result, there is a close correlation between the use of Malay and the Islamic practice in Singapore. Recent scholarly articles (e.g. Aman, 2009; Bakar, 2015; Ong & Chew, 2013) have also observed that young, primary-school-aged Malay students use mainly Malay in the domain of religion, and that the community believes that Islam must be learnt in Malay. As such, it is also said that it is precisely the use of Malay in religious instruction that has played an important role in maintaining the use of Malay in Singapore (Kassim, 2008). As religious classes and sermons are regularly held in Malay, speakers are likely to assume that the interlocutor understands them due to the close association between the language and the topic. However, as can be seen in (9), the code-switching in this study went beyond the specific religious terms. Even non-religious terms such as “receiving knowledge from lessons”, “have to read”, and “before teaching, prayers after teaching” were referred to in Malay, suggesting therefore that the domain association is a trigger for the code-switching to occur.

For the older speakers, it was observed that they had a tendency to switch from Malay to English when the topic was associated with technology. In (11) and (12) respectively, the speakers were talking about the functions of a phone or a lamp.

- (11) **Eh-*Kenapa* you mute?**
 Irah(OLD) Eh- Why did you mute (the phone)?
- (12) ***Boleh on. Boleh on.***
 Ain(OLD) Can (switch it) on. Can (switch it) on.
Boleh on ke? Oh, ah ah, ader off.
 Aisha(OLD) Can (switch it) on is it? Oh, ah ah, there's (an) off (switch).

There was clearly an association between English and technology, making English the language of technology. The lexical terms 'mute', 'on', and 'off' have their Malay equivalents. However, the examples in (11) and (12) show that the speakers still code-switched into English. It is clear that speakers did not switch codes due to the lack of suitable terminology in the other language, but rather, the switch was made based on topics. This pattern was consistently seen in the data collected from both the young and old participants. Youths almost always spoke about religion in Malay while the older speakers kept the technological jargon in English.

Communication effect. This function refers to code-switching when it is used to emphasize a topic, persuade, exaggerate or to tease or joke with friends. For example, in (13), the speaker switched from English to Malay to emphasize how incredibly easy on the ears someone's accent was.

- (13) **There's this ah person I follow and his English is super sedap**
 Nur(YNG) **tau. Like sedaper than mine!**
 There's this person I follow (on social media) and his English is
 super lovely to listen to you know! Like nicer than mine!

And in (14), we see the speaker choosing to switch into Malay when persuading his friend to try something new.

- (14) **HAHAH! So funny! Cuba la... Cuba pergi! Bukit Gombak**
 Lyn(YNG) **used to have! But I don't know-**

HAHA! (That's) so funny! You should try... Try check it out!
Bukit Gombak used to have (it)! But I don't know-

This function was not restricted to only the young speakers. When the older participants intended to create a communication effect, they also code-switched into English to exaggerate (in 15) and to tease their friend about their romantic life (in 16).

- (15) ***Sebelah sana, you kena jalan all the way there!***
Aish(OLD) Over on that side, you have to walk all the way there!
- (16) ***HAHA! Bagus jugak, boleh beli letak kat rumah. Candle light dinner.***
Ain(OLD) HAHA! Not a bad idea, I can buy and place it at home. Candle light dinner
HAHA! Ain nak candle light Encik Sufi? HAHA! Anniversary?
Fitri(OLD) HAHA! Ain, you want (to have a) candle light dinner with Mr. Sufi? HAHA! Anniversary?

Practicality. This function refers to speakers who code-switch when the language can accurately describe a feeling or an action succinctly without compromising the nuanced meanings a language conveys. In (17), the speaker used the word “leper” as an adjective to mean “flat” or “a lack of volume”. However, the original definition refers to the depth of a plate, specifically to mean “shallow”, yet the meaning of “leper” has evolved to generically mean “flat”.

- (17) ***Ya lah, pasal before-balik rumah, ah then leper, lepas mandi, it's still like leper.***
Lyn(YNG) Ya DISC PART because before – going home, ah then (my hair has no volume), after taking a shower, it's still like (has no volume).

Mutual understanding of terms or phrases is also exemplified in (18), where both speakers understood the social stratification, privileges, and status the term “anak menteri” carries.

- (18) **Oh it's the anak menteri**
Ana(YNG) Oh, it's the politician's child.
Imah(YNG) **OH! He is anak menteri?**
 OH! He is a politician's child?

Being an “anak menteri” or a Malaysian politician's child sets the tone that the person comes from an elite background. It may also imply negative characteristics, such as being materialistic or entitled. The same went for the older speakers, as shown in (19) and (20), where terms like ‘fastfood’ or ‘factory outlet’ were in English, and not Malay.

- (19) ***Sini takde fastfood ke?***
Musa(OLD) There's no fastfood places here?
- (20) ***Yang tuari you pergi Bandung you pergi which factory outlet?***
Ain(OLD) The other day you went to Bandung, you went to which factory outlet?

Proper names. This category refers to code-switching instances where speakers choose to stick to the proper name of a place, event, festival, regardless of the language, as evident in (21) and (22).

- (21) **Guys, you must understand how much this girl posts on her**
Nur(YNG) **Instagram! I can't scroll down unt-until hari raya!**
 *Hari Raya is the annual Muslim festival that marks the end of
 Ramadan, known internationally as Eid.

In (22), the speaker did not change the name of a nursing home, and in fact, the term “nursing home” also appeared in English.

- (22) *Dier kesian laki dah meninggal. Tinggalkan dier dalam nursing home, Sunshine Welfare Association of*
Ali(OLD) *She’s a pity, her husband passed away. Left her in a nursing home, Sunshine welfare association of=*

Repetition/translation/explanation. Poplack (1987) referred to this function as speakers who switch codes when they are explaining or translating, as exemplified in (23), where Nur(YNG) explained that the stall owner had given Ana(YNG) the wrong pasta sauce.

- (23) Ana(YNG) *I asked for mushroom.*
Nur(YNG) *Really? HAHA*
Ana(YNG) *And then she put cream. So=*
Nur(YNG) *=she salah taruk ah.*
She made a mistake PART.

Similarly, in (24), the speaker began with English, but went on to explain why she had stopped cutting her hair and allowed it to grow out, and the further explanation was given in Malay.

- (24) *First time ever! Cause malas nak gunting nak buat aper.*
Farah(YNG) *First time ever! Cause I’m lazy to cut it, what to do...*

In example (25), the speaker was translating the word “memanda” to the listener. Since both speakers were equally fluent in English, the most economical method to define the word was to translate it into English.

- (25) *Apa makna memanda?*
Rosa(OLD) *What’s the meaning of ‘memanda’?*

Hmm *macam admiral gitu. Admiral.*

Hmm it's like an admiral. Admiral.

Fitri(OLD)

(26)

Ali(OLD)

So instead of you start at seven o'clock, you start at eight o'clock. *So you habis pukul dua belas, dier habis pukul braper?*

...you end at 12, he ends at what time?

Expression. Poplack (1987) referred to this function as the point “where the switch calls attention to or brackets the English intervention by the use of expressions” (p. 226), and (27) and (28) illustrate this aptly.

(27)

Farah(YNG)

I think before marriage, *dier cam baik*, then after marriage the tanduk semua keluar ah.

I think before marriage, he was nice, then after the marriage his devil horns started to show ah.

(28)

Mary(YNG)

Y'know? Like it's merepek-meraban what all these stuff.

Y'know? Like it's a bunch of gibberish what all these stuff.

In (27), Farah(YNG) made use of the phrase “tanduk semua keluar”, a common local slang, to refer to someone's devilish ways. The term “tanduk” refers to horns. In (28), for example, the phrase “merepek-meraban” is an expression used in Malay specifically to mean “a bunch of gibberish”. As can be seen, this is an expression that does not have a close equivalent in English.

The older participants also often used “okay” or “dah okay” to refer to situations that were acceptable, as seen in (29) and (30).

(29)

Ain(OLD)

Makanan sekarang dah okay. Dah improve la.

The food now is pretty okay. It has improved.

(30)

Tak- pasal dier cakap, pelamin in, pelamin and décor all in, so

Aish(OLD) **it's okay.**

No – because they said, the dais is included, dais and décor are all in, so it's okay.

Temporality. The data also shows that speakers switched codes when they spoke about temporal categories. In example (31), Farah used the Malay preposition “daripada” when recalling the past.

(31) Farah(YNG) **Oh you didn't know eh?**

Maria(YNG) **I didn't know.**

Farah(YNG) **Daripada primary school I think.**
(It was) since primary school I think.

Temporal categories such as months and days were also referred to in English by the older speakers, as seen in (32) and (33) below.

(32) **Next month *Angah pun nak pergi luar negara.***

Ain(OLD) Next month Angah wants to go overseas too.

(33) ***HAHA. Saturday, Sunday dah kene kerja?***

Aida(OLD) HAHA. Saturday, Sunday already have to work?

Terms of affiliation. Speakers also switched codes when they referred to kin, and this function is referred to as “terms of affiliation”. For the young participants, they used Malay terms of affiliation to refer to their kin, for example in (34), where “mother” and “younger sibling” were referred to in Malay. This was perhaps done to mark respect and community affiliation or it could also be habitual.

(34) **But she live with her mak? YKNOW! I've never seen her family before? I've only seen her adik.**

Maria(YNG)

But she lives with her mom? YKNOW! I've never seen her family before? I've only seen her younger sibling.

Interestingly, the reverse happened with the older generation speakers. In (35), English was used for kinship terms, and this was perhaps done to mark intimacy and emphasize their special relationship or bond.

- (35) ***Telur asin lagi eh? Then next time I can bring my husband dating.***
Ain(OLD)

Salted eggs again? Then next time I can bring my husband along.

- (36) ***You-you saudara dekat boleh la. My husband punya saudara tak boleh.***
Aish(OLD)

You-you close relatives are fine. My husband's relative can't do it.

Acquired terms. Interestingly, from the data, it was observed that Singaporean Malay speakers have acquired and used new terms that are specific to their community and culture. This, we refer to, as “acquired terms”. Both the terms “rabak” and “lepak” have evolved to hold very different connotations from the words’ original meanings, which are “tattered” and “to lounge” respectively. In (37), the speaker used the term “rabak” as an adjective to show how something negative had worsened. The word “lepak” is used to connote a sense of aimlessness and lax behavior.

- (37) ***But even then damn rabak! It was like, I was thinking damn lepak!***
Nur(YNG)

But even then (it was) very extreme! It was like, I was thinking (it's very) lax!

Another acquired term is the word “combine”, which is used to refer to the specific situation of both bride and groom sharing a wedding ceremony. It is customary for Malay couples to hold separate ceremonies, one each for the bride and groom. However, the high expense of holding a wedding in Singapore has created a new trend of having one “combined” wedding, instead of two separate ceremonies. The use of this acquired term can be seen in (38).

- (38) ***HEHE then dorang cakap nak combine.***
Rosa(OLD)

HEHE then they said (they) want to combine.

Fitri(OLD)	<u>Combine?</u> <i>Kalau <u>combine</u>, restoran tak boleh la... Sempit kan?</i>
Rosa(OLD)	If they combine, (the) restaurant can't DISC PART... Not enough space right? Ah ah, <u>combine</u>, restoran tak boleh.
Ain(OLD)	Ah ah, combine, (the) restaurant can't (do it).

Discussion and Conclusion

This paper has explored the frequency and functions of code-switching in English-Malay bilinguals in Singapore. From the data we described earlier, it is clear that code-switching is spontaneous and pervasive. Code-switching clearly also has distinct discourse functions, and the functions observed are: grammatical categories, seeking affirmation/clarification, topic/domain association, creating a communication effect, practicality, proper names, repetition/translation/explanation, expression, temporal categories, terms of affiliation, reported speech and acquired terms. The data presented on code-switching in the English-Malay bilinguals also reflect how the multilingual nature of Singapore's community has played a significant role in the way conversational interactions are conducted. It is clear from the data analyzed that the Malay community regularly taps their additional language as a resource. Both the young and old participants code-switch intra-sententially at least 80% of the time in conversations, and this is clearly a reflection of the ubiquitous nature of code-switching in the community. From the conversations, it is also clear that both languages, Malay and English, are interwoven seamlessly into conversations and are not treated as two mutually exclusive entities.

An interesting pattern observed from the data is the different manner in which the younger and older groups code-switch. The older participants tend to code-switch from Malay to English, and the younger participants are primarily English-dominant, code-switching from English to Malay. This speaks in large part to the matrix language frame model put forth by Myers-Scotton (1993). The matrix language framework theorizes that only one variety would provide the grammatical feature, while the embedded language would provide largely content morphemes. An overview of the data collected shows that the embedded language for the different generations differs between English and Malay. This intergenerational difference in

code-switching also serves as a key indicator of the language shift occurring within the community as well. As reported by Cavallaro and Serwe (2010), the number of Malays using English at home is steadily increasing. Tan (2014) has also argued that English can be seen to be the linguistic mother tongue of many young Singaporeans, the Malay community notwithstanding. The younger speakers seem to be more comfortable conducting a large part of their conversations in English as opposed to Malay. The code-switching patterns, as observed in this paper, serve as further evidence for language shift from Malay to English in the Malay community in Singapore.

The data presented is emblematic of the fluid nature of code-switching and it does not follow a fixed syntax and structure in an informal setting. Past definitions (Bell, 1976; Blom & Gumperz, 1972; Hudson, 1980; Milroy & Muysken, 1995; Myers-Scotton, 1993) of code-switching have framed it to be an alternation of languages while maintaining the grammatical characteristics unique to each language. However, as seen from the code-switching patterns of the Malay community in Singapore, it is clear that grammatical categories have not been maintained by the speakers. Malay and English are used interchangeably and without strict adherence to grammatical structures in either language. Clearly, code-switching is done as a communicative tool with specific functions, and not merely as a grammatical tool as most would argue. This lends credence to Matras' (2009) definition of code-switching as the use of more than one language in the course of a single communicative episode. This definition provides a broader encapsulation of the phenomenon without restrictions, while acknowledging that code-switching patterns are varied across different communities.

Early definitions of code-switching have also tried to capture it as a type of bilingual behavior reflecting a universal linguistic structure. Typologies and frameworks developed based on code-switching have tried to fit bilingual speech habits into a singular universal framework. Yet studies on code-switching in bilingual speakers have shown that not all communities conform to the same typologies, framework or even definition of code-switching. Gumperz's (1982) taxonomy has been constantly modified to fit the community, while Myers-Scotton's (1993) matrix language framework has been challenged by other studies which argue that code-switching utterances may not "display superordinate-subordinate relationship", but instead reflect an equal usage of the two varieties (Jacobson, 2001, p. 60). However, the data collected from this study has not shown a clear code-switching structure or syntax. Instead, similar to what

Heller (2007) and Poplack (1987) have observed, code-switching does not have clear boundaries or lines where speakers switch languages. Malay bilingual speakers in our data switch languages in between turns, within utterances, and between speakers during conversations. The seemingly non-systematic structure of the code-switching data presented therefore throws into question the concept of a universal linguistic system. Instead of focusing on the grammaticality of code-switching, the data presented here shows that it is the community of speakers that provides the answer to understanding the phenomenon. As Alvarez-Caccamo (1998) has also suggested, language as a social practice, and by extension code-switching, is socially significant and needs to be understood in the context of other forms of language contact phenomena occurring in the community (Heller, 2007). In the current world of complex and diverse multilingual communities, it would be remiss to approach code-switching as a universalist grammatical exercise.

This paper has also highlighted the effective bilingual capabilities of Singapore's Malay community and how the community is effective in tapping into both of their linguistic repertoires to achieve strategic communicative goals. In this light, this paper challenges the idea that code-switching is suggestive of a person's lack of proficiency in the language. To label and make assumptions about the way a community speaks without taking into consideration social changes would only further alienate the community which the language represents. As mentioned earlier, the difference in code-switching patterns in both generations is emblematic of the language shift the community is experiencing. While we have seen how the old and the young speakers code-switch differently, this paper did not look into the interaction between the older and younger speakers. This is an area which can be explored further to understand code-switching when the "dominant" languages differ.

It must also be noted that this study was conducted with a small number of participants, and the participants in each group had known each other for years and their conversations were recorded in informal settings. Much like what was observed in other studies (Brown & Fraser, 1979; Fishman, 1965), language behavior observed in informal settings, while more natural, also differs rather significantly from language use in more formal settings. Code-switching is also dependent on the participants' background, attitudes towards the languages, and many other factors which would undoubtedly affect the frequency and its role in conversations, and this is

one area which can be looked into in future research. And if so, it can most certainly shed light on the way speakers construct their linguistic and social identities through code-switching.

As can be seen, code-switching is prevalent and pervasive, and while this paper has highlighted the code-switching behavior of Malay-English bilinguals in Singapore, it would be of interest to also compare this to the other two linguistic communities in Singapore – the Chinese-English bilinguals and the Tamil-English bilinguals. And with that, we may then be able to fully appreciate the complexities of a multilingual linguistic ecology, and only then can speakers and authorities understand code-switching as a communicative device, and not a linguistic defect.

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Appendix A

Example of transcript (Old Malay-English bilingual speakers), Broad English transcription in italics.

Rosa	Sempit lah. Kalau nak buat combine, tak boleh la - I think. Kalau buat sendiri <i>The room is a little tiny. If you want to do a combine wedding, you can't – I think. You can do it solo.</i>
Ain	But that one, is ah makanan dier is quite okay. <i>But that one, the food is quite okay.</i>
Rosa	Ah betul, Desa Kartika makan is quite okay. Then this one, dier punya package is quite - inilah, comprehensive jugak la. Termasuk kad semua. Then dier ader kek, berkat la. <i>True, Desa Kartika's food is quite okay. This one, their package is quite – comprehensive, you can say. Inclusive of invitation cards. And they provide cake and doorgifts too.</i>
Ain	Oh, ni termasuk berkat semua la? <i>Oh, it's inclusive of a door gift?</i>
Rosa	Ah, berkat, pelamin. Thats why. <i>Yup, doorgift, a wedding dais. That's why.</i>
Aisha	Oh, okay la.
Fitri	Ah.
Aisha	Tapi kalau dah combine, tak boleh la. <i>But if you want to combine, I don't think you can.</i>
Rosa	Mine, memang, tak boleh la. So I was- tengok la! Tunggu cam mana. cakap nak combine, combine ajer la. <i>Mine, definitely can't! So I was – we'll see! Wait and see! They say they want to combine, then we'll combine.</i>

Aisha	You-you saudara dekat boleh la. My husband punya saudara tak boleh <i>You-if it's your close relatives then it's fine. My husband's side is too big.</i>
Ain	Jangan macam dier ni nyer ipah. berduai-duai, tak payah <i>Not like his in-laws, too many of them, don't even bother.</i>
Rosa	Immediate immediate ajer. <i>Immediate family only.</i>
Ain	Ah, immediate immediate tu sudah. Cakap satu kepala dua puluh ah! Sometimes, never pay that much of money also! <i>Yes, immediate family only. One person is \$20! Sometimes, never pay that much of money also!</i>
Rosa	Mmm hahah
Ain	Ni dua puluh plus plus ader? <i>Is this inclusive of tax and service charge?</i>
Rosa	Mungkin ah. <i>Maybe.</i>
Fitri	I thought nett?
Ain	Nett ah?
Rosa	Kalau kita nak tukar aper, mungkin kene keluar. <i>If we want to change anything, maybe it'll be more.</i>
Fitri	Tapi, kalau termasuk berkat okay lah. Considered reasonable la. <i>But, if it's inclusive of doorgift, then it's okay. Considered reasonable.</i>

Appendix B

Example of transcript (Young English-Malay bilingual speaker), Broad English transcription in italics.

Jack	Then, you can just cabut la I think <i>Then, you can just leave I think.</i>
Mary	You can - my sister was talking about that, then like=
Jane	=she's quite unhappy about that?
Mary	Ya, she's quite unhappy about it la. Then she's like OH MY GOD why are you taking so much of my time Y'know? Like it's merepek- meraban what. All this stuff. UNNECESSARY right? <i>Ya, she's quite unhappy about it la. Then she's like</i> <i>OH MY GOD why are you taking so much of my time Y'know? Like it's nonsensical</i> <i>what. All this stuff. UNNECESSARY right?</i>
Jane	Ya
Mary	Then like, apparently got, some, got some Wak Tanjong people who go over. Like Isabel? Shafiqah? And Hani? And they were like telling my sister also, that "Ya this doesn't happen at Wak Tanjong at all" I think if it happens, I'd be like "Okay BYE?"
Jane	Ya so we were like - Does your sister teach at Wak Tanjong before? Al-Maarif is it?
Mary	Maarif. I think- after your teaching, you can just - cabut ah! <i>Maarif. I think- after your teaching, you can just - leave ah!</i>
Jane	Ya then do you, do you start a briefing and a debriefing? Do you have a briefings and debriefings?
Mary	Ya, we got briefing in the morning. BUT, dorang selalu lambat! <i>Ya, we got briefing in the morning. BUT, they're always late!</i>
Jane	HAHA
Mary	So it's basically like, "Ok, today we're doing Math and Science and these are the worksheets" That's it la.
Jane	=but must bace doa and stuff like that ah? <i>=but must say some prayers and stuff like that ah?</i>
Mary	Tak! <i>No!</i>
Jane	OH MY GOD we have like DOA sebelum mengajar, doa selepas MENGAJAR and then doa - biler time with the students. Like when the class starts, we have to read <i>OH MY GOD we have like a prayer before lessons, a prayer for after lessons and then a</i> <i>prayer- during our time with the students. Like when the class starts, we have to read</i>
Mary	OH REALLY?!

Sources of article semantics in L3 English: Definiteness and specificity

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Abstract

This study investigates the sources of article semantics in the acquisition of L3 English by L1 Arabic-L2 French adult learners in a foreign language context. Three sources are considered: Universal Grammar (UG), the native language and the second language. Two groups of intermediate and advanced L3 learners and one English control group completed a written forced-choice elicitation task combining the semantic features of definiteness and specificity. The results show that, like speakers of article-less languages, the performance of the intermediate L3 learners presents fluctuation effects in [−definite, +specific] and [+definite, −specific] contexts. Thus, UG options can override facilitative transfer in these contexts even when the L1, L2 and L3 settings of the Article Choice Parameter match. Furthermore, like speakers of article-based languages, their performance shows non-facilitative L1 Arabic transfer affecting the morpho-phonological realization of indefiniteness in the form of article omission in L3 English. Therefore, both UG and the L1 interact to shape the use of articles in early L3 grammar construction. Comparatively, the performance of the advanced L3 learners converges with that of the English native speakers, indicating that the appropriate use of articles in [±definite] and [±specific] contexts is ultimately nativelike in L3 acquisition.

Keywords

L3 English, definiteness, specificity, L1/L2 transfer, fluctuation

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It is common classroom observation that learners of English as a second or foreign language have a difficult time with the article system and the degree of difficulty varies depending on whether or not their L1s have articles (Master, 2002). Their learning difficulty takes two forms: article omission and article misuse. Traditional lists of rules on article usage show little effect and, according to Butler (2002), may even make acquisition much more difficult. Although articles are frequent in input and morphologically simple, they are semantically complex because, as Master (2002) remarks, they do not consist of a one-to-one form-meaning relationship. One account proposes that articles involve the semantic features of definiteness and specificity and these depend on discursive and pragmatic considerations to determine the choice of the article (Ionin, 2003; Ionin et al., 2004; Ko et al., 2006).

This study examines knowledge of articles in non-generic use in L3 English of L1 Moroccan Arabic-L2 French adults. First, we present the semantics of the article system in English, French, and Moroccan Arabic. Then, we summarize previous findings in L2 acquisition (L2A) that are relevant to the study. A review of the article system in L3 acquisition (L3A) follows. Finally, the details of the experiment are explained, followed by the data analysis and discussion. It is concluded that the L3 learners (L3s) in the intermediate stage rely on a combination of their native knowledge and Universal Grammar (UG) to map the concepts of definiteness and specificity to the English articles before their performance converges in the advanced stage with that of the native speakers.

Article semantics: definiteness and specificity

Articles are considered properties of the semantics-morphology interface. An interface refers to a point of connection between two or more modules within the grammar or between these modules and other aspects of cognition (Ramchand & Reiss, 2007). According to Ionin (2003), articles cross-linguistically encode two independent semantic features: definiteness and specificity. These are discourse-dependent since they rely on the knowledge of the speaker and the hearer in a communicative situation (Slabakova, 2010). According to Heim (1982, 1991) and Lyons (1999), definiteness presupposes the *existence* and *uniqueness* of the entity defined in a context or with respect to the shared knowledge of the speaker and hearer. Comparatively, indefinites do not access the common ground the interlocutors share. Unlike definiteness, specificity relates to

the knowledge of the speaker alone. The speaker *intends to refer* to a unique entity in the set denoted by the noun and considers this entity to possess some noteworthy property (Ionin, Ko & Wexler, 2004).

Ionin (2003) proposes that article use in languages with two articles is determined by the setting of a discourse-related parameter, the Article Choice Parameter (ACP). Languages differ parametrically in whether they encode definiteness or specificity. Some languages like English, French, and Arabic encode definiteness while others like Samoan encode specificity. Table 1 illustrates article grouping cross-linguistically (Ionin, Ko & Wexler, 2004).

Table 1. Two settings of the Article Choice Parameter

Definiteness-based languages		Specificity-based languages	
[+definite]	[−definite]	[+definite]	[−definite]
[+specific]	√	[+specific]	√
[−specific]		[−specific]	√

The implication of the ACP for L2A is proposed in the Fluctuation Hypothesis (FH) (Ionin, 2003). This suggests that L2 learners (L2s) of article-less languages, when acquiring a language with articles, will (1) have full access to UG and therefore (2) go back and forth, i.e., fluctuate, between the two settings of the ACP until adequate input allows them to set the value of the parameter correctly. We now present how definiteness and specificity are encoded in the article systems of the languages the L3s speak.

English

English morphologically encodes definiteness only. The article *the* is [+definite] and used with definite nouns while *a* (and its allophone *an*) is [−definite] and used with indefinite singular count nouns. Plural count nouns and mass nouns take no article (Ø). This study focuses on the acquisition of singular, non-generic count nouns to limit the number of variables.

On the other hand, specificity plays no role in article choice in English. It cuts across the definiteness distinction. *The* is used for all definite nominals, specific and non-specific, which is also true of *a* and indefinite nominals. The categorization of the two articles in English using the

features [$\pm$ definite] and [$\pm$ specific] gives four combinations illustrated in Ionin, Zubizarreta and Philippov (2009) as follows:

(1) [+definite,+specific] context:

I want to talk to *the winner of this race* - she is a good friend of mine.

(2) [+definite, -specific] context:

I want to talk to *the winner of this race* - whoever that happens to be.

(3) [-definite, +specific] context:

Professor Robertson is meeting with *a student from her class* - my best friend Alice.

(4) [-definite, -specific] context:

Professor Robertson is meeting with *a student from her class* - I don't know which one.

In example (1), the speaker refers to a particular person/referent. Both the hearer and the speaker know who the winner is, but the speaker provides further information that she is his best friend. In (2) the speaker does not state any noteworthy property of a particular individual who is also the winner of the race. He knows that there is only one winner in any race and he wants to speak to him/her. In (3) the speaker has a particular/specific person in his mind (Alice) but the hearer does not know about her. In (4), however, neither the speaker nor the hearer knows about the referent. There is no specific person in the mind of the speaker.

French

Like English, French has an article system that marks definiteness but, in addition, French articles mark number and gender. Three allomorphs encode definiteness: *le* (masculine singular), *la* (feminine singular), and *les* (masculine or feminine plural). Three others encode indefiniteness: *un* (masculine singular), *une* (feminine singular), and *des* (masculine or feminine plural). The study focuses on article usage with singular nominals in a scenario where L2 = L3; thus, we control the potential effect of number in L2 French on L3 English.

All articles may be [$\pm$ definite, $\pm$ specific] depending on the context. What we explained about the English examples (1-4) is true of their French equivalents (5-8) below:

(5) [+definite,+specific]

Je voudrais rencontrer le vainqueur de cette course - elle est un bon amie à moi.

I'd want to meet the winner of this race - she is a good friend to me

'I'd like to meet *the winner* of this race - she is a good friend of mine.'

(6) [+definite,-specific]

Je voudrais rencontrer le vainqueur de cette course - qui que ce soit.

I'd want to meet *the winner* of this race - who that he is

'I'd like to meet *the winner* of this race - whoever he is.'

(7) [−definite,+specific]

Prof. Robertson est avec une étudiante de sa classe - ma meilleure amie Alice.

Prof. Robertson is with *a student* of her class - my best friend Alice

'Prof. Robertson is with *a student* from her class - my best friend Alice.'

(8) [−definite,−specific]

Prof. Robertson est avec une étudiante de sa classe - je ne sais pas laquelle.

Prof. Robertson is with *a student* of her class - I not know which

'Prof. Robertson is with *a student* from her class - I don't know which one.'

Arabic

The article system in Moroccan Arabic (MA) is based on definiteness. It has the clitic *l-*, null article ($\emptyset$), and the compound *wahād l-*. The definite article is the clitic *l-*. It is not inflected for gender or number as in French. Phonologically, /l/ assimilates to the initial consonant of a word in the case of dental consonants (t, d, l, r, n) or sibilants (s, z, ʃ); for example, /d-dar/ (the-house), /r-rajəl/ (the-man), /z-zit/ (the-oil), /ʃ-ʃarika/ (the-company), but /l-ktab/ (the book) and /l-bab/ (the-door). In MA, the indefinite article with singular or plural nouns is phonologically null, which results in a bare noun, e.g., *maʒəlla*, *maʒəllat* (a magazine, magazines). This bare noun can be interpreted as [−definite,+specific] (9a) or [−definite, −specific] (9b) depending on the context:

(9a) *qri-t Ø maʒəlla smiyət-ha Time.*

read-I magazine name-her *Time*

'I read a magazine called *Time*.'

(9b) *bi-t n-qra Ø maʒəlla kimma kan-t.*

want-I I-read magazine like was-it

'I want to read a magazine, whatever it is.'

In addition to the null article that allows (non)-specificity readings depending on the context, MA expresses indefinite specificity unambiguously using the indefinite specific article ‘*wahəd* (l-)’ (Lit. one (the)). *Wahəd* is usually followed by the definite article /l-/ or its allophones, but the /l-/ on the noun is semantically vacuous (Jamal Ouhalla, personal communication.). *Wahəd* does not bear a definite or a non-specific reading (example (13)). The four combinations of the features [$\pm$ definite] and [$\pm$ specific] for MA are as follows:

(10) [+definite, +specific] context:

bi-t n-tkəlləm mša l-faʔiza f-s.sibaq - ra-ha wəhda mən šhabati.

want-I I-talk with the-winner in-the.race - see-she one of friends

‘I want to talk to the winner of this race - she is a friend of mine.’

(11) [+definite, –specific] context:

bi-t n-tkəlləm mša l-faʔiza f-s.sibaq - t-kun lli kan-t.

want-I I-talk with the-winner in-the.race - she-is that was-she

‘I want to talk to the winner of this race - whoever that happens to be.’

(12) [–definite, +specific] context:

*lustada Robertson f-liqa mša Ø (*wahəd t-*)ʔaliba f-l-qisəm - šahəbt.i Alice*

Prof. Robertson in-meeting with (a) student in-the-class - friend.my Alice

‘Prof. Robertson is meeting with a student from her class - my friend Alice.’

(13) [–definite, –specific] context:

*lustada Robertson f.liqa mša Ø (**wahəd t-*)ʔaliba f-l-qisəm - ma.n.ʔraf ʃkun fi.hum*

Prof. Robertson in-meeting with a student in-the-class - not.I.know who in them

‘Prof. Robertson is meeting with a student from her class - I don’t know which one.’

While (10) and (11) pattern with the English and French specific and non-specific use of the definite article, the last two differ. In (12) the nominal can be specific in two ways. If a null article (Ø) is used, the ending appositive phrase is necessary for the nominal to be specific. Otherwise, it will be non-specific like (13). The alternative to express specificity in (12) without the appositive phrase is the article *wahəd*.

In summary, English, French, and MA lexicalize articles on the basis of definiteness, sharing the same setting for the ACP. The first two differ by marking [–definite,–specific] singular count nouns with an overt article (*a/un*) while MA uses a null article for [–definite,–specific] as well as [–definite,+specific]. Additionally, MA has the indefinite specific article ‘*wahəd (l-)*’. Table 2 contrasts the three systems.

Table 2. Article distribution for singular count nouns

Context	MA	French	English
[+definite, +specific]	l-	le/ la	the
[+definite, –specific]	l-	le/ la	the
[–definite, +specific]	Ø/wahəd l-	un/ une	a/ an
[–definite, –specific]	Ø	un/ une	a/ an

English articles in adult L2A

The generative literature on adult acquisition of articles in L2 English is extensive. Two lines of research can be distinguished: studies that test the FH and English articles among L2s of article-less L1s (e.g., Ionin et al., 2003; Ionin et al., 2007; Ionin, Ko & Wexler, 2004; Ionin & Wexler, 2003; Kim & Lakshmanan, 2009; Ko et al., 2008; Snape, 2009), and those that consider the interaction between fluctuation and L1 transfer among L2s of article-based L1s (e.g., Guella, Deprez & Sleeman, 2008; Ionin, Zubizarreta & Maldonado, 2008; Sarko, 2009; Snape, 2008).

Most of the L2 studies using speakers of article-less languages such as Russian, Korean, and Japanese are replications of Ionin (2003) both in terms of method and results. These studies have argued that these L2s have access to semantic universals of UG; there is nothing relevant to transfer from their L1s. Therefore, they fluctuate in the choice between the definiteness and the specificity settings of the ACP. Specifically, in L2 English, they misinterpret the articles *the* and *a* to encode [±specific] instead of [±definite]¹⁰. Given the language background of our L3s, we focus on the second trend of inquiry, which is equally extensive. The proposals have been

¹⁰ Within this first trend of inquiry, Snape et al. (2008) tested adult L1 Mandarin L2s of English but reached a different conclusion supporting L1 transfer over fluctuation. Chinese Mandarin is article-less.

discussed from UG, L1 transfer, and L2 input points of view. What follows is a review of three studies representing the research done with learners with article-based L1s.

Ionin, Zubizarreta and Maldonado (2008) considered the source of linguistic knowledge for the acquisition of articles in L2 English. The L2s were L1 Russian and L1 Spanish adults. Russian is article-less while Spanish is article-based. The experiment was a written elicitation task using short dialogues. It was an open-ended, free-response task and articles were not suggested as options.

The L2 groups showed two different developmental patterns. The Russian L2s fluctuated between specificity and definiteness as predicted. They overused *the* in [+specific, –definite] contexts and *a* in [–specific, +definite] contexts. The Spanish L2s were more accurate on [–specific, +definite] than [+specific, +definite] due to high omission of articles. This reflects L1 negative influence where the article can be omitted in some contexts. The Spanish L2s were not affected by specificity and took definiteness as the basis to provide the correct article. The study suggested that L1 transfer overrides fluctuation.

The authors argued that the Spanish group transferred the semantics of Spanish articles onto English. For the Russian group, however, they apparently derived knowledge about the English articles from two sources: L2 input and direct access to semantic universals (UG). In sum, the meaning of English articles cannot be deduced from the input alone. L1 transfer and/or UG knowledge intervene.

Guella et al. (2008) conducted research with beginning L1 Dutch adults learning L2 Standard Arabic. The two languages are definiteness-based. The study investigated whether the L2s would transfer their L1 knowledge or show specificity effects (fluctuation) as expected with L2s of an article-less language background. The participants completed a written forced-choice elicitation task using singular nouns. They had two options *él* (the) and $\emptyset$ (indefinite article). The results revealed fluctuation in the L2 performance reflecting neither the L1 nor L2 setting. They overused *él* (the) in [–definite, +specific] contexts and $\emptyset$ in [+definite, –specific] contexts, like L2s with article-less L1s. At face value, this supports UG access even when the L1 and L2 settings match, which is ‘unexpected’. Guella et al. (2008) put forward some possible explanations. One is that even if the interface rules mapping pragmatics to lexical expressions (articles) are the same in any two languages, the L2s have to learn that these rules are the same as in their L1 (Guella et al., 2008, p. 68). This, however, runs counter to the findings showing that

acquisition is not redundant. For example, previous linguistic knowledge is brought into subsequent learning with its negative and/or positive effects (e.g., Flynn et al., 2004; Rothman, 2013; Rothman, Giancaspro & Halloran, 2014). Finally, the authors warned that their claim that UG overrode L1 transfer needed further support since they used fewer task items than necessary (three per context).

As a comment, the alleged similarity between the article system in Dutch and Arabic is only partial. In particular, Dutch uses *een* with indefinite singular nouns and a null article with plural nouns while Standard Arabic uses a null article for both. This may explain why the L2s fluctuated. Since their L1 partly differs from the L2, the Dutch beginning L2s of Arabic may have resorted to the universal options of UG to transcend conflicting language-specific options.

Finally, Sarko (2009) addressed the issues of fluctuation, L1 transfer and UG access in L2 English of French and Syrian Arabic learners. French patterns with English but Syrian Arabic differs in that the indefinite article is null while the definite article is lexical (*al-*). The Arabic and French-speaking L2s were divided into four subgroups ranging from lower intermediate to upper advanced. The size of the last subgroup (five Arabs and two French) is too small to draw valid conclusions about the L2 endstate. The experiments conducted were a story recall task and a forced-choice elicitation task. The target items were count singular nouns, count plural nouns, and mass nouns.

The results showed that the Syrian and French L2s of English (except the lower and upper-intermediates) reached nativelike attainment in [+definite,±specific] contexts. They correctly used the definite article as predicted. The L2 groups were also accurate in [−definite,−specific] contexts, rightly using *a*. However, in [−definite,+specific] contexts, the French were nativelike but not the Syrian learners. The performance of the Syrian advanced group presented at least 20% misuse of *the* in [−definite,+specific] contexts, but the five very advanced participants were nativelike.

These results provided evidence for L1 Arabic transfer. Sarko (2009) found that the Arabic learners overused *the* with [−definite,+specific] nouns modified by a relative clause since, in Syrian Arabic, a relative clause with an overt complementizer requires a definite article. The problem was not with the [−definite,+specific] condition per se, because they correctly used *a* as a marker of indefiniteness for [−definite,+specific] items without a relative modification (and for [−definite,+specific] contexts). All in all, the target-like behavior of the French and the

approximate performance of the Syrian Arabic groups reflected the similarities and differences that hold between their L1s and English. The learning outcome was eventually nativelike.

In summary, L2 studies on article choice largely demonstrate that L1 transfer can override fluctuation in adult L2A. L2s from various language backgrounds like Spanish, Greek, Dutch, and Arabic resort to their native knowledge of the article system to cope with the L2 input. The more similar the two systems are, the easier the acquisition of the target system is. L1 transfer plays facilitative as well as inhibitive roles depending on whether the two languages match or not.

English articles in L3A

There is little research on the acquisition of articles in the L3. Leung (2002) and Jaensch (2008) are two prominent studies. Leung (2002) investigated articles in L3 French from a syntactic rather than a semantic perspective. The properties tested were the categories of Determiner (D), Number (Num), the feature strength of Num, and the feature $[\pm\text{definite}]$ in a scenario where L1 Cantonese $\neq$ L2 English = L3 French. Cantonese lacks articles and the ‘formal’ feature $[\pm\text{definite}]$ on D. The author investigated whether the L3s had access to UG or their developing grammar was doomed to impairment because the tested features were not previously active in the L1.

For the L3 initial stages, the adult L3s were advanced in L2 English but beginners in L3 French. The results indicated that they acquired the categories D and Num like the French controls. Leung (2002) attributed this to partial transfer of the L3s’ L2 knowledge. On the other hand, the results for definiteness in the L3 varied across the tasks. With regard to the L3 endstate, Cantonese adults advanced in L2 English and L3 French were tested. Like the L3 beginners, the advanced L3 performance was nativelike on D and Num but their performance on $[\pm\text{definite}]$ was not consistent across the tasks. Leung (2002) concluded that the results tended to support full access to UG rather than permanent impairment. Leung (2007) reconsidered these results and stated that the difficulty the L3s’ had in production was due to processing constraints.

L3 German was the focus of Jaensch (2008, 2009). Jaensch (2008) investigated the acquisition of definiteness in L3 German of L1 Japanese-L2 English adults. The study considered the effect of L2 proficiency on the L3. Like English, German encodes definiteness in articles while specificity depends on the context. The article in German, however, changes form

depending on the gender, number and case of the noun. Japanese is article-less. The Japanese L3s were divided into lower-intermediate, upper-intermediate and advanced groups. Each of these was further divided into three subgroups depending on their L2 English proficiency - elementary, lower-intermediate, and upper-intermediate, resulting in extremely small groups. The study predicted that the influence of L2 English would enhance accuracy, depending on the L3s' proficiency in the L2 and the L3. If the L2 had no influence, the L3s would fluctuate between definiteness and specificity. The test was a written multiple-choice task where the L3s had to select an article among ten exponents including the zero article.

The results indicated that the Japanese L3s of German did not fluctuate between definiteness and specificity. Generally, they supplied the appropriate articles 78% of the time. It was noted that a significant number of article choices, particularly in the lower L3 German level, were based neither on definiteness nor on specificity due to a strong effect of the inherent dative case of the noun. Jaensch (2008) pointed to the computational overload on the L3s' brain. They could not integrate definiteness and inherent dative case at the same time. As for the second research question, the results showed that the performance of the L3s improved following their L2 English proficiency. We remark, however, that the difference between the L2 proficiency groups did not reach significance. There was 'some' L2 facilitative effect. The L3s of equal German proficiency but a higher L2 proficiency outperformed those with a lower L2 proficiency. Finally, Jaensch (2008) pointed out the need for larger sample groups in order to reach stronger conclusions.

In summary, the findings in L3A show that the L2 intervenes (positively) in the process of article choice in the L3. Yet, transfer of prior linguistic knowledge may only be partial and its influence seems to depend on the L2 proficiency level and the complexity of the target article system. In this study, we present a clearer picture of L3A by abstracting away from properties like case and gender and focusing on definiteness and specificity. We consider whether the advanced L3s can acquire these semantic concepts in a nativelike manner and whether fluctuation or L1/L2 transfer obtains.

Method

Hypotheses

Assuming L3s have access to the L1, the L2, and UG, this study investigates the source(s) of article semantics knowledge in L3 English of L1 Arabic-L2 French bilinguals. Is it L1 or L2 transfer as demonstrated in previous research on learners with knowledge of article-based L1s/L2s where the ACP is set on definiteness? Or is it UG as proposed by the FH for L2s with article-less L1s? The L2 and L3 studies reviewed, the linguistic description in the article semantics section and the FH tenets led us to put forward the following learning hypotheses:

Regarding the intermediate L3s:

(1) If they resort to UG, they would fluctuate between definiteness and specificity, overusing the definite article in [–definite,+specific] contexts.¹¹

(2) If L1 Arabic is the transfer source, it would affect the morpho-phonology (realization) of the article in [–definite,–specific] contexts. Some degree of competition between the indefinite article *a* and the null article $\emptyset$ is expected. As to [–definite,+specific] contexts, the Arabic article *Waḥad* might decrease the use of a null article, which is an alternative in this context in MA. [+definite,±specific] contexts would be positively influenced (L1=L3).

(3) If L2 French is the transfer source, article use in L3 English would be positively enhanced in all four contexts (L2=L3).

For the advanced L3s:

(4) Their performance would be nativelike in all four contexts, as previous L2/L3 research concluded.

Design and Instruments

We used a written forced-choice elicitation task adapted from Ionin (2003). The task consists of 32 short dialogs that illustrate four conditions or contexts: [+definite,+specific], [+definite,–specific], [–definite,+specific], and [–definite,–specific]. There were eight items per

¹¹ Contrary to the assumptions of the early version of the FH in studies like Ionin et al. (2004), Fuli (2007) and Tryzna (2009) analyzed new data from the Samoan article system and showed that the language marks the specificity distinction with indefinites only, not with definites. Following this, Ionin et al. (2009) proposed a modification of the FH where the overuse of the definite article *the* in [–definite, +specific] contexts was more predicted than overuse of the indefinite article *a* in [+definite, –specific] contexts. We assume this later version of the FH.

condition (see the appendix). The target sentence in the dialogs lacked an article and the participants were instructed to fill in the gap selecting from three options (*a*, *the* or $\emptyset$ if no article was needed). For variable control, all the target nominals were singular count DPs. We told the participants to pay attention to the whole dialog since this would influence their answers. The four conditions were randomized and 40 distracter dialogs on wh-words were added. The total number of dialogs was 72 divided on tasks A and B to minimize the effect of tiredness. In each group, half of the members started with task A and the other half with task B. There was a seven-to-ten-day lag between the two tasks.

Participants

The total number of participants in this study was 59 adults sorted into three groups. The intermediate L3 group includes 25 adult native speakers of MA with a mean age of 21.08 years. According to Oxford Placement Tests,¹² they are intermediate to advanced in L2 French (range 21 to 45 out of 50 points) and intermediate in L3 English (range 21 to 30 out of 50 points). They started formally learning the L2 at the age of eight and the L3 at the age of 15. The setting for learning English is a foreign language context. We refer to this group as the intermediate L3s.

The advanced L3 group is 22 native speakers of MA with a mean age of 36.7 years. They started learning L2 French formally at the age of eight and their proficiency is post-intermediate to advanced according to the Oxford Placement Test of French (range 36 to 48 out of 50 points). They started learning L3 English formally at the age of 16 in a foreign language context and their L3 proficiency is advanced as determined by the Oxford Placement Test of English (range of 41 to 49 points). We refer to this group as the advanced L3s.

The control group is composed of 12 native speakers of American English with an average age of 30.4. We refer to this group as the English native speakers (EngNS).

Results

[+definite, +specific] context

Table 3 displays the results of the participants in definite specific contexts. It shows how often they select *the*, *a*, $\emptyset$ in raw scores and percentages. The scores are calculated by multiplying the test items per condition (8 items) by the number of participants in each group.

¹² www.lang.ox.ac.uk/tests/

Table 3. Article use and omission in [+definite, +specific] contexts

	the (target answer)	a	Ø null
L3 intermediates	81% (162/200)	8% (16/200)	11% (22/200)
L3 advanced	100% (176/176)	0%	0%
EngNS	96.87% (93/96)	3.12% (3/96)	0%

The scores of the choices in the [+definite,+specific] context were as expected for the three groups, with the advanced L3s responding in a target-like way. A one-way ANOVA indicated a significant difference, $F(2,56) = 27,56$, $p < .001$. Post-hoc Bonferroni revealed significant differences between the intermediate L3s and each of the L3 advanced and control groups ($p < .001$). The latter two performed comparably ($p = 1$). Although the L3 intermediate group did well, their performance presented an aggregate score of 19% of article misuse and omission, which we attributed to the process of ongoing learning at this stage. The L1 influence is evident by 11% of article omission, which is illicit with singular count nouns in the L2/L3. Next, we consider the results of the [+definite, −specific] condition in Table 4.

[+definite,−specific] context

Table 4. Article use and omission in [+definite, −specific] contexts

	the (target answer)	a	Ø null
L3 intermediates	75% (150/200)	13.5% (27/200)	11.5% (23/200)
L3 advanced	98.86% (174/176)	1.14 (2/176)	0%
EngNS	95.83% (92/96)	4.17% (4/96)	0%

A one-way ANOVA showed a significant intergroup difference, $F(2, 56) = 16.02, p < .001$. Once again, Bonferroni tests revealed differences between the intermediate L3s on the one hand and the L3 advanced and native participants on the other ($p < .01$). The latter two groups performed similarly. As in the preceding context, instances of article misuse and omission add up to 25% in the intermediate L3 performance, which is substantial. The results showed that the L3 advanced group performed in a nativelike manner in definite contexts regardless of specificity. We take up the [–definite,+specific] condition in Table 5, where a specificity effect is predicted.

[–definite,+specific] context

Table 5. Article use and omission in [–definite, +specific] contexts

	the	a (target answer)	Ø null
L3 intermediates	25% (50/200)	62% (124/200)	13% (26/200)
L3 advanced	17.61% (31/176)	80.68% (142/176)	1.7% (3/176)
EngNS	16.66% (16/96)	82.29% (79/96)	1.04% (1/96)

A one-way ANOVA with post-hoc Bonferroni tests revealed a highly significant difference between the three groups, $F(2, 56) = 8.78, p < .001$. There was a significant difference between the intermediate L3s and the other two groups ($p < .01$), but the results of the advanced L3s and the native controls were comparable ($p = 1$).

The accuracy rate of the advanced L3s dropped from ceiling scores to about 80% when it comes to the use of *a* in [–definite,+specific] contexts. They incorrectly used *the* 17.61% of the times. This suggests that they take *the* to encode specificity in addition to definiteness. However, even the English native speakers obtained a similar score, using *the* 16.66% of the times. We looked at item scores to understand this. The problematic items for both groups were #4 and #14 in Task 1:

[4] *Watching TV:*

Son: Is the news over?

Father: Not yet. The presenter is to interview ____ (Ø / an/ the) activist from Green Peace - Alexandre Paul, who is well-known for his opposition to Arctic oil drilling.

[14] *At the birthday party:*

Son: Where's Dad? I don't see him.

Mother: He's going to be late. He is having dinner with ____ (Ø / a/ the) manager from his company. His name is Mr. Blake.

Ignoring the scores on these two items improves accuracy among the advanced L3s to 93.18% and the controls to 94.44%. We put forward an account for this below. Finally, the results for [–definite, –specific] condition follow in Table 6.

[–definite, –specific] context

Table 6. Article use and omission in [–definite, –specific] contexts

	the	a (target answer)	Ø null
L3 intermediates	16.5% (33/200)	72% (144/200)	11.5% (23/200)
L3 advanced	2.27% (4/176)	96.02% (169/176)	1.7% (3/176)
EngNS	4.16% (4/96)	94.79% (91/96)	1.04% (1/96)

A one-way ANOVA indicated that the three groups differ highly significantly ($F(2, 56) = 21.71$, $p < .001$) and post-hoc tests showed the same contrasts observed for the contexts above: the intermediate L3s differ significantly from the other two groups ($p < .001$) while the results of the advanced L3s and the native controls do not ($p = 1$). While the omission of the article *a* is expected in the L3 intermediate data, they unexpectedly used a definite article (16.5%) in [–definite, –specific] contexts. This is likely due to their limited L3 proficiency and misinterpretation of discursive and pragmatic cues. Indeed, an item analysis revealed that, in Task 1, item 8 was problematic with 12 participants out of 25 using a definite article and item 27 where seven L3s did the same. We have here an effect of item bias. Excluding the two items increases the intermediate L3s' accuracy to 81.33%:

[8] *At a magazine headquarters:*

Journalist: What will be the top story for next week's issue?

Editor-in-chief: We interview ____ (Ø / a/ the) Green Peace activist (whoever it is). For the following issue, we will interview someone from the World Wildlife Fund (WWF).

[27] *In a bookstore:*

Little Tom: I'd like to have something to read, but I need help.

Librarian: Well, what are your interests? We have books on most subjects.

Little Tom: Well, I like wildlife, oceans ... I'd prefer ____ (Ø / a/ the) book about the Arctic bear. I like to read about endangered animals!

Discussion

In light of the statistical analysis, we move now to a discussion of the performance of the L3s. We start with the intermediate L3s and maintain that L1 Arabic and UG seem to be the joint sources of article semantic knowledge in L3 English. For convenience, we repeat the learning hypotheses for these learners starting with the first:

(1) If they resort to UG, they would fluctuate between definiteness and specificity, overusing the definite article in [–definite,+specific] contexts.

Hypothesis (1) is confirmed. We reiterate that the article system of the three languages is definiteness-based. Yet, the intermediate L3s obtained the lowest score on the four conditions in [–definite,+specific] contexts with 62% correct article choice and they incorrectly used the definite article *the* in these contexts 25% of the times. This indicates that the intermediate L3s were in a fluctuation phase. When they did not fluctuate, an additional difficulty surged: the morpho-phonological realization of the indefinite article. They wrongly used the null article Ø with count singular nominals (13%) like in MA instead of the phonetically overt indefinite article *a* as English requires. Thus, in this context, the intermediate Arabic-speaking L3s of English showed specificity effects like speakers of article-less languages, taking *the* to encode specificity while indefiniteness is dually encoded in the null article and the article *a*.

It is worth noting that even the learners' correct usage of the indefinite article *a* in [–definite,+specific] contexts (62%) may be attributed to L1 facilitative influence. First, the article *a* is the closest phonetic match of the Arabic indefinite-specific article '*wahad (l-)*' (i.e., a certain) rather than the null article. Second, the null article alternative is ambiguous in MA between indefinite specific and indefinite non-specific readings depending on the context, which

may have reduced its use here. For all these reasons, [–definite,+specific] contexts illustrate the joint intervention of UG and L1 transfer.

As we noted above, the English natives and the advanced L3s preferred *the* instead of *a* in items #4 and #14 in Task 1. To account for this, we assume Trenkic's (2009) proposal that learners formulate an explicit strategy based on specificity to regulate article usage. In her study, the L2s' article misuse was attributed to a strategy linking *the* and *a* respectively to the presence vs. absence of "explicitly stated knowledge". In items #4 and #14, this knowledge is 'Alexandre Paul, who is well-known for his opposition to Arctic oil drilling' and 'His name is Mr. Blake'. The referent is identified by name and so it is more a [+definite, +specific] context. Let us revisit Hypothesis (2):

(2) If L1 Arabic is the transfer source, it would affect the morpho-phonology (realization) of the article in [–definite,–specific] contexts. Some degree of competition between the indefinite article *a* and the null article $\emptyset$ is expected. As to [–definite,+specific] contexts, the Arabic article *Wahad* might decrease the use of a null article, which is an alternative in this context in MA. [+definite,±specific] contexts would be positively influenced (L1=L3).

Hypothesis (2) is not confirmed. In [–definite,–specific] contexts, the intermediate L3s largely preferred the indefinite article *a* (72%) to the null article (11.5%). This does not mean that L1 knowledge was neutral. Residual transfer in the form of article omission persisted in the four contexts including unexpectedly the [+definite,+specific] context (11.5%). Bare nouns are grammatical in MA but strictly restricted in French. The rates of using the indefinite article and the null article are close regardless of the contexts. Following Master (2002), perception partly explains this: articles in English are difficult to perceive because they are unstressed. Therefore, the intermediate L3s were indecisive about the status and semantic values of the indefinite and null articles in L3 English. (For [–definite,+specific] contexts, see the discussion of Hypothesis (1) for a possible interpretation of the data in support of L1 facilitative effect).

Considering [+definite,–specific] contexts, the intermediate L3s' overused the indefinite and the null articles *a*/ $\emptyset$ substantially and their scores add up to 25% of the answers. It confirms the predictions of the (early version of the) FH and plays down the potentially facilitative role of the L1. Finally, it was not at all expected that they would use *the* in [–definite,–specific] contexts (16.5%), unless we blame it on the L3s' limited proficiency and misinterpretation of the subtle discourse cues.

As for [+definite, +specific] context, the intermediate L3s obtained the highest accuracy rate compared to indefinite contexts, but not without some residual L1 transfer of the null article (11%). This reflects the interlanguage similarity in this respect.

(3) If L2 French is the transfer source, article use in L3 English would be positively enhanced in all four contexts (L2=L3).

The hypothesis is disconfirmed. The substantial scores of L1 negative transfer in the four contexts contrast with the semantic and morpho-phonological similarities the article systems of French and English share. Unlike MA, the marking of indefiniteness in French is phonetically overt. However, the intermediate L3s' rates of article omission in the four contexts are more or less regular, around 11%, leading to bare nominals licit in MA but illicit in French.

In sum, for the intermediate L3s, the source of article semantics is UG and the native language. L1 Arabic had its effect in the form of article omission, which persisted across the four contexts. We claim that, at this stage of learning, the participants did not yet associate the null article $\emptyset$ with any one of the concepts of [$\pm$ definiteness] or [$\pm$ specificity], nor did they drop it completely as incompatible with singular count nouns in English. As for UG, it accounts for definiteness-specificity fluctuation evidenced in [$-$ definite,+specific] and [+definite, $-$ specific] contexts, which reflects neither the L1 nor L2 and L3 settings. Thus, while L1 transfer affects article form (article omission), UG affects article meaning (semantics). Finally, for the advanced L3s, the results confirmed Hypothesis (4):

(4) Their performance would be nativelike in all four contexts, as previous L2/L3 research concluded.

The advanced L3s attained nativelike accuracy, scoring above 96% in three contexts. Even with 80.68% on the [$-$ definite,+specific] condition, this achievement converged with that of the native controls. However, the convergence of the two groups is not to hide the L3s' residual fluctuation effect between definiteness and specificity (17.61%), which we attributed to two experimental items. In addition, for the English controls, this is not unprecedented. Previous studies found that interface properties were challenging even for native speakers, whose performance showed optionality (e.g., Belletti, Bennati & Sorace, 2007; Prévost, 2011). Given the subtlety of the discourse triggers related to speaker and hearer knowledge, evaluating the situation is often ambiguous and generalizing from the triggers is a difficult process (Ionin, 2003, p. 88).

How do the findings of this study with L3s compare to previous research with L2s? As in Ionin, Zubizarreta and Maldonado (2008) and Ionin, Ko and Wexler (2004), the native speakers of Arabic, an article-based language, showed fluctuation effects by overusing the definite article *the* in [–definite,+specific] contexts and the indefinite articles (*a/Ø*) in [+definite,–specific] contexts, like L2s whose L1 is article-less. This is in line with the early version of the FH. However, they are partially in line with the latest model as proposed in Ionin et al. (2009). The findings herein square with Guella et al. (2008) involving Dutch L2s of Arabic. Therefore, fluctuation occurs whether the L1 has articles or not. Moreover, our findings showed that UG may override facilitative transfer in [–definite, +specific] contexts even when the L1, L2 and L3 settings match.

On the other hand, our L3s partly differ from the Syrian Arabic L2s of English in Sarko (2009) who did not fluctuate on [+definite,–specific]. As regards the advanced L3s, they did as well as the English native speakers across the four contexts. This provides firm ground for Sarko’s (2009) claim supporting L2 nativelike attainment based on an approximate performance of the Syrian L2s. In a nutshell, the Moroccan L3s behaved like speakers of article-less languages by accessing UG and like those of article-based languages by resorting to L1 transfer, in the form of article omission.

In comparison with previous studies on L3A, we provide empirical evidence for Leung’s (2002: 158-159) claim that L3s have access to UG, especially its semantic features. We also restrict learning difficulty to [–definite,+specific] and [+definite,–specific] contexts but not the whole [±definite] contexts as claimed in Leung (2002). On the other hand, we could not test Leung’s finding that L2 knowledge partially transfers into the L3, since the language pairing here does not allow us to distinguish L1 from L2 facilitative effect. Instead, we have evidence for L1 non-facilitative transfer in the form of article omission in the L3 intermediate stage. We suppose that L1 influence did not emerge in the performance of Leung’s L3 French beginners because their L1 Cantonese lacks articles and the feature [±definite] altogether. The only knowledge of an article system they had was that of the L2. As for Jaensch’s (2008) L1 Japanese-L2 English learners of L3 German, her lower level L3s were too influenced by inherent dative case of the noun to show the status of definiteness and specificity in their L3 interlanguage. The problem was one of variable confound.

Finally, we propose an explanation of the (intermediate) L3s' recourse to UG and L1 transfer: processing ability. Research already showed that interface properties are prone to residual optionality even among near-native L2s, e.g., Sorace and Filiaci (2006). Integrating semantic with pragmatic/contextual information taxes the language processor. We stipulate that this integration is even harder for the trilingual learner. The L3s here could not draw on transfer alone because article usage in three languages is already complex and difficult to disentangle. Therefore, for 'blurred lines' contexts in the middle of the article semantic continuum, [–definite, +specific] and [+definite, –specific], they relied on UG that offers only two settings of the Article Choice Parameter and so they transcended the set of language-specific rules of prior systems. However, in the clear-cut contexts of [+definite, +specific] and [–definite, –specific] at the two ends of the continuum, they resorted to L1 Arabic where the article is morpho-phonologically simpler (*l-* or $\emptyset$) and is not inflected for gender and number like the French definite (*le, la, les*) or indefinite articles (*un, une, des*).

Conclusion

This study follows the line of research that investigates the interaction between fluctuation and L1 transfer in adult L3 acquisition. The learners were L1 Moroccan Arabic-L2 French-L3 English trilinguals. The three languages are article-based. The results of a written forced-choice elicitation task indicate a number of findings. (1) The intermediate L3s fluctuate between specificity and definiteness, overusing the definite article *the* in [–definite, +specific] contexts and the indefinite articles *a*/ $\emptyset$ in [+definite, –specific] contexts. Thus, UG options can override L1/L2 facilitative transfer. Their transitional L3 knowledge reflects the L1/L2 setting of the ACP. (2) Fluctuation in these contexts may prevail regardless of whether the L1 is article-less or article-based. (3) L1 transfer persists and affects the morpho-phonological realization of indefiniteness encoded jointly in the null article $\emptyset$ and the article *a*. Finally, (4) article semantics is ultimately acquirable in the L3 advanced stages. For future research, we need to consider a situation where the role of L2 French would empirically be easily distinguished from that of the L1. One such relevant property is the interplay between articles and genericity.

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Appendix: Forced-choice elicitation task

[+definite, +specific] context

1. At the office.

Visitor: Can I see the secretary, please?

Receptionist: She is with ____ (Ø / a/ the) manager. He is a very busy person. He needs her to keep his meeting agenda.

2. At the market.

Chris: Well, we've got everything we wanted. Shall we go?

Mike: Not yet. I want to talk to ____ (Ø / a/ the) owner of this clothes shop. She is a former classmate.

3. At the police station.

Detective Andrews: You look very busy.

Detective Smith: Yes. Do you remember Mrs. Clark, the famous lawyer in the city? We are trying to find ____ (Ø / a/ the) murderer of her husband; his name is Tom Rogers, a well-known criminal.

4. After a football match.

Pedro: What an awful match! We have the best players but we couldn't win.

Diego: It was not the players' fault. I feel ____ (Ø / a/ the) referee was biased.

5. At home.

Mom: Are you coming home for lunch?

Leila: No, I'll be late. I have a job interview with ____ (Ø / a/ the) manager of Axa Insurance agency, René Gerard.

6. In a downtown street.

Paul: What's going on? Why are these people gathering?

Traffic officer: They're waiting for ____ (Ø / a/ the) minister of culture - Ronald Romney. Today is the official opening of this new museum.

7. At the university library.

Student: I want to borrow a novel, *The Good Terrorist*. Is it available?

Librarian: Yeah, do you know that ____ (Ø / a/ the) writer is a Nobel laureate in Literature?

Student: Yeah, Doris Lessing in 2007. That's why I want to read it.

8. At home.

Husband: I was at the hospital today for a checkup.

Wife: What did ____ (Ø / a/ the) doctor tell you?

Husband: Nothing serious. He wrote a prescription for vitamin supplements.

[–definite, +specific] context

1. Watching TV.

Son: Is the news over?

Father: Not yet. The presenter is to interview ____ (Ø / an/ the) activist from Green Peace - Alexandre Paul, who is well-known for his opposition to Arctic oil drilling.

2. At the birthday party

Son: Where's Dad? I don't see him.

Mom: He's going to be late. He is having dinner with ____ (Ø / a/ the) manager from his company. His name is Mr. Blake

3. In a crowded train station, where people are meeting arriving passengers

Robert: Excuse me, sir. I am trying to find ____ (Ø / a/ the) tall black man in a gray suit. Did you see him?

Security guard: I think I saw someone like this at the information desk.

4. Meeting on a street.

Douglas: Hi, Bill. It's nice to see you again. Are you back for good?

Bill: No, I am just on a visit to ____ (Ø / a/ the) friend from college - his name is Ron Jackson, and he invited me for his wedding.

5. At a film festival.

Reporter: Hi, I am having an interview with ____ (Ø / a/ the) movie star. Her name is Nicole Kidman.

Security guard: Are you the reporter from ABC?

Reporter: Yeah.

Security guard: She's waiting for you in the guest room.

6. Two friends are chatting.

Julie: Louise, I have a very bad toothache and I am looking for a good dentist.

Louise: I know ____ (Ø / a/ the) very experienced dentist. I'll bring you his phone number if you like.

7. At the police station.

Chief Officer: It's time for me to leave. Are you still working?

Detective: Yes, I have to listen to ____ (Ø / a / the) lady. She's a poor woman who's been beaten by her husband.

8. In a school library.

Librarian: How can I help you?

Student: I am looking for ____ (Ø / a / the) novel. It's a classic by Charles Dickens. It's called *A Tale of Two Cities*.

[+definite, -specific] context

1. At home:

Louise: It's getting late. Is your sister back from school?

Julie: She called to say she is talking to ____ (Ø / a / the) headmaster of her school! I don't know who that is. I hope she is not in trouble.

2. At a Hi-Fi store:

Shop assistant: May I help you?

Customer: Yes, please. I bought a stereo here, but it's broken! I want to talk to ____ (Ø / a / the) manager of this store. I don't care who that is! I am going to make a complaint!

3. At the police station:

Police officer: Last weekend, Mr. Stevenson's house was robbed. Did you get to anything?

Detective Andrews: Well, we are trying to find ____ (Ø / a / the) burglar, but we still don't know who he is.

4. Two airport security members are talking about an incident.

Jay: The press is talking about the plane that landed in emergency yesterday.

Bob: Yes, it was a miracle. I don't know who he is but ____ (Ø / a / the) pilot must be very experienced.

5. At the scene of a road traffic accident.

Policeman: Did you see what happened at this corner?

Witness: Oh, yes. A car hit this young boy and ____ (Ø / a / the) driver drove off so fast that I couldn't recognize him.

6. At a supermarket.

Seller: Good morning, sir. Can I help you?

Customer: Yes, please. Can I talk to ____ (Ø / a / the) customer service manager, please?

Seller: Of course. He's at the desk over there.

7. At an art gallery:

Laura: Wow! What a beautiful sunset painting!

Susan: Yeah! I'd like to know ____ (Ø / a/ the) painter. Unfortunately, it is not signed.

8. At an athletics tournament:

Reporter: I'd like to interview ____ (Ø / a/ the) winner of men's 800m final.

Organizing committee member: You've got to see his agent. Anyway, after the race finishes, there will be a press conference open to all journalists.

[-definite, -specific] context

1. At a magazine headquarters:

Journalist: What will be the top story for next week's issue?

Editor-in-chief: We interview ____ (Ø / a/ the) Green Peace activist (whoever it is). For the following issue, we will interview someone from the World Wildlife Fund (WWF).

2. At the train station.

Tourist: I'm looking for ____ (Ø / a/ the) hotel. Any cheap hotel is fine.

Guide: You can't find one here at the city center. You've got to go farther.

3. In a bookstore.

Little Tom: I'd like to have something to read, but I need help.

Librarian: Well, what are your interests? We have books on most subjects.

Little Tom: Well, I like wildlife, oceans ... I'd prefer ____ (Ø / a/ the) book about the Arctic bear. I like to read about endangered animals!

4. At a film festival.

Reporter: Hi, I'm Tom Brook from CBS. I'd like to interview ____ (Ø / a/ the) movie star. It doesn't matter who it is.

Communications agent: Just leave your phone number and I will get back to you later.

5. Mother and son are talking at home.

Mother: How was Sam's birthday party?

Son: It was great, Mum. Sam told us that his father bought him ____ (Ø / a/ an / the) new smart phone.

6. At a souvenir shop.

Shop Assistant: Hi, Miss. Can I help you?

Customer: Yes, please. I want to buy ____ (Ø / a/ the) present for my mom's birthday but I don't know what to choose. You've got so many lovely things.

7. Preparing for a travel:

Mike: Karen, can I have something to read during the trip? It's a long journey, you know.

Karen: Sure. Take ____ (Ø / a/ the) book from that bookshelf.

8. At the police station:

Police officer: I heard there's a problem on Main Street. Anything serious?

Detective: Very bad. ____ (Ø / a/ the) jeweler was just found killed in his shop. I don't know yet
who it is.

Universal Syntax in Optimality Theory: A Case Study on Three Austronesian Languages

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Abstract

Language universals and linguistic variation are important concepts underlying all syntactic theories. In this paper, we aim to show how these two notions are illustrated in the construct of optimality theory (OT). To achieve this goal, we present a case study that involves three Austronesian languages, Tagalog, Atayal, and Tsou, to help demonstrate that OT is an appropriate syntactic theory to deal with the inherent conflict of the two notions. As will be shown, the three languages exhibit different ordering of precedence between the head noun and two types of relative clauses. An OT approach allows us to adopt the same syntactic schema and the same syntactic constraints to account for the cross-linguistic ordering variations. The different hierarchical ranking proposed for the same set of constraints successfully established a syntactic pattern that shows universal properties on the one hand, and allows linguistic variation on the other.

Keywords

OT syntax, universal grammar, Austronesian languages

This paper discusses universal syntax from the perspective of optimality theory (OT). The discussion will proceed along two lines. First, this paper shows how OT deals with syntactic phenomena that are considered significant as they occur repeatedly across different languages.

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Second, this paper illustrates how OT accounts for language variations that traditionally are attributed to parameter differences in the sense of generative syntax. In addition, we investigate the ordering divergence between restrictive and nonrestrictive relative clauses in three Austronesian languages as a demonstration to illustrate how OT manifests the aforementioned properties.

The discussion is organized as follows: Section 2 briefly illustrates the concept of universal grammar, and introduces the basic theoretical assumptions and framework of OT. A case study based on a cross-linguistic comparison between restrictive and nonrestrictive relative clauses is provided in Sections 3 and 4. Section 3 shows the syntactic patterns of the two kinds of relative clauses in Tagalog, Atayal, and Tsou. Section 4 provides an optimality theoretic-based approach to account for the structures at issue, and points out that OT has the ability to pursue and present both language universals and linguistic variation in an insightful way. Section 5 concludes the paper.

OT and Universal Grammar

This section introduces the concept of universal grammar (UG) and how the concept can be accounted for under the theoretical framework of OT. The introduction is divided into two parts. The first part focuses on UG in general; the second part continues illustrating how the important concepts introduced in the first part are embodied in the theory of OT.

Universal Grammar

The idea of universal grammar (UG) was developed very early by Chomsky (1972, 1986) and widely discussed by other linguists such as Cook and Newson (1988), Fodor and Sakas (2004), Haegeman (1991), Pesetsky (1999), among many others. The main argument of UG proposes that all the surface intricacies and diversities one can find among different languages are derived from a uniform system of principles and mechanisms that are shared by all human languages and stored in the mind of all human beings; the uniform system constitutes the language users' innate ability, which enables them to acquire their first language and refine their language skills. On the other hand, the observable cross-linguistic differences demonstrate that UG contains a large number of parameters. Linguists find no agreement on the number and kind of parameters that should be enclosed in the properties of UG (Baker, 2001; Fodor & Sakas, 2004; Haspelmath,

2007; Kayne, 2005; Pinker, 1994; Roberts & Holmberg, 2005). The number could range from 10 to thousands, and the type varies from the general schematic structure such as a basic word order and the pro-drop phenomenon, to each specific feature of functional categories such as animacy, anaphora, and definiteness. What they agree on is that parameters are postulated to explain the existing cross-linguistic variations. Every parameter is endowed with its own switchboard, and cross-linguistic variations are exhibited when particular languages turn the switch to a certain option.

The pursuit of UG is the ultimate goal of almost all linguistic theories. In the realm of syntax, all the dominant theories follow the generative tradition (Carnie, 2002), which according to Tseng (2017) contains four underlying assumptions as stated in (1):

(1) *Theoretical Assumptions of Generative Syntax* (Tseng 2017, p. 164)

- Sentences are generated by a subconscious set of principles and rules. These principles and rules are part of our mind, which contains an innate language faculty.
- Syntactic theories present a system to formally describe these principles and rules in a precise way, so that all of the well-formed sentences in a language can be generated and all of the ill-formed ones can be rejected.
- Syntactic theories within the generative framework should be general enough to not only reveal the principles and rules of particular languages, but also to introduce the principles and rules that govern the structures of all natural languages.
- These universal principles and rules reflect the intrinsic properties of the language faculty that all humans possess regardless of which language they speak.

To be concise, a syntactic theory is general on the one hand, and specific on the other. It should be general enough to reflect the properties of UG, the common principles and mechanisms that are shared by all languages; it should also be specific enough to be able to account for variations found across a wide variety of languages.

Optimality Theory

Optimality Theory (OT) (McCarthy & Prince, 1993a, 1993b; Prince & Smolensky, 1993) is a constraint-based linguistic theory developed early in the 1990s. OT describes grammar as a process of evaluation that involves competition based on a set of hierarchically ranked linguistic constraints. Given an input structure, candidates are generated and then evaluated together

through an input–output mapping process; the one that incurs the least serious violation(s) of the constraints is derived as the winning output, that is, the grammatical form for the input.

Following the generative tradition, OT captures syntactic phenomena with two theoretical premises. First, OT pursues UG by assuming that all syntactic principles and rules are universal, which are presented in the form of constraints. Second, OT realizes the concept of parameter by proposing that syntactic principles and rules are conflicting in nature, and thus all syntactic constraints are violable, while grammar in the sense of OT is depicted as a particular ranking of these universal constraints.

The following schematic architecture is adopted from Kager (1999), illustrating the evaluation process in the OT grammar that maps input to output by selecting the candidate that best matches the constraint hierarchy.

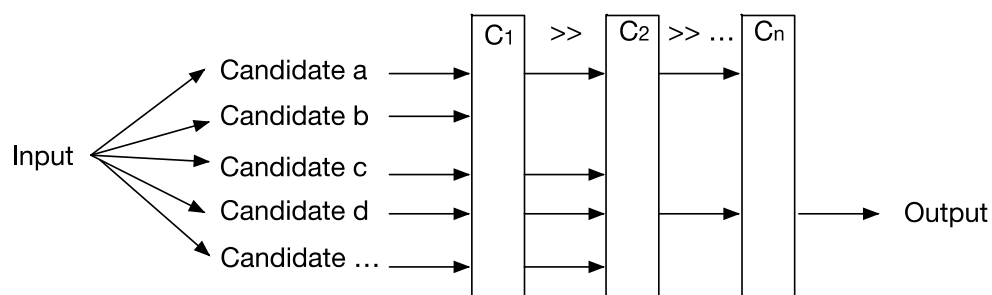


Figure 1. Mapping of input to output in OT grammar (Kager, 1999, p. 8)

In this diagram, Candidate d is the winning output because it survives the elimination process. All of the other candidates are eliminated because each of them violates a higher-ranking constraint at some point during the process.

In the following section, we present the contrast between restrictive and nonrestrictive relative clauses in three different languages to demonstrate that OT appears to be theoretically adequate in explaining the theory of UG, and that OT is probably one of the best generative approaches that has the capacity to reconcile the conflicting nature between language universals and linguistic variation.

Restrictive and Nonrestrictive Relative Clauses in OT

A relative clause (RC) acts as a phrasal modifier that modifies its head noun. Relative clauses can be classified into two different types: restrictive and nonrestrictive RCs; the former construction (R-RC) restricts the referent of the head noun to a subset of a large domain; by contrast, the latter construction (NR-RC) simply adds parenthetical information to the head noun. The distinction can be seen in the following examples (2) and (3):

- (2) John bought the bicycle that has yellow handlebars in Walmart. **(R-RC)**
(3) John bought the bicycle, which has yellow handlebars, in Walmart. **(NR-RC)**

In (3), the relative clause *which has yellow handlebars* provides additional information about the bicycle that John has purchased in Walmart. Different from (3), the sentence in (2) implies that there is more than one bicycle in Walmart for John to choose, and he picked a specific one that has yellow handlebars for his purchase. In other words, the clause *that has yellow handlebars* in (2) functions to specify which bicycle John bought; it provided information to narrow the field of candidates down to an exact one.

McCawley (1998) discussed many grammatical differences between the two constructions in English (pp. 427–454). According to him, the two types of relative clauses have different surface structures, the restrictive RC occurs as an adjunct of N-bar (N') while the nonrestrictive RC adjoins to noun phrase (NP) or other kinds of phrasal constituent,¹⁴ as shown in Figure 2.

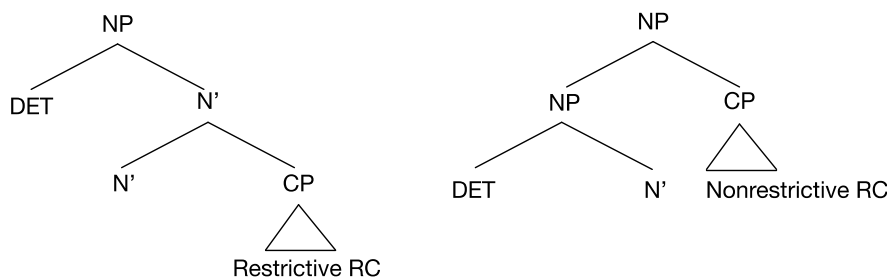


Figure 2. Syntactic Structure of R-RC and NR-RC

¹⁴ A nonrestrictive relative clause can be an adjunct of phrasal elements other than NP; for example, it adjoins to a whole sentence in (a), and a verb phrase (VP) in (b):

(a) Jay claimed that his new album would be great, which I believe.

(b) Susan flew back to Germany, which Joe did too.

Tagalog¹⁵

Tagalog relative clauses can either precede or follow their head noun. The relative clause is linked to the head noun by the linker *na*, which functions as a relative pronoun like *who* and *which* or a relativizer like *that* in English. The linker¹⁶ is realized by its allomorph =*ng* when following a vowel, a glottal sound /-h/, or a nasal sound /-n/. The allomorphic variation =*ng* is phonologically dependent and thus must attach to its preceding word (Kroeger, 1993, pp. 12–13).

(4) (from Schachter & Otnes, 1972, p. 123)

- a. **titser** **na** [nagbigay ng libro sa kaniya ng mga
teacher link AV-perf-give gen book dat 3sg gen pl
istudyante]
student
‘the teacher who gave the book to her students...’
- b. [nagbigay ng libro sa kaniya ng mga istudyante=**ng**]
AV-perf-give gen book dat 3sg gen pl student=link
titser
teacher
‘the teacher who gave the book to her students...’

(5) (from Schachter & Otnes, 1972, p. 124)

- a. Pumunta ka sa **tindahan=ng** [pinuntahan ko].
AV-go 2sg.nom dat store=link perf-go-DV 1sg.gen
‘Go to the store I went to.’
- b. Pumunta ka sa [pinuntahan ko=**ng**] **tindahan.**
AV-go 2sg.nom dat perf-go-DV 1sg.gen=link store
‘Go to the store I went to.’

Following Kroeger’s approaches (1990, 1993), I suggest the following phrase structure in Figure 3 for the relative construction in Tagalog. Each NP is dominated by a KP with K being the case marker. The relative clause is dominated under an S node, which joins with the head noun to form an NP constituent. Inside the NP, the configuration can be either left- or right-headed.

¹⁵ Tagalog is an Austronesian language spoken by about 15 million speakers. It is used as the official language in the Philippines.

¹⁶ The linker is a characteristic device of Austronesian languages. It functions to connect modifier phrases to the head. For example, in Tagalog when a noun is modified by an adjective, a deictic pronoun, or a quantifier, the linker will be inserted in between to connect the two elements. The same linker also appears to link adverbial modifiers to their head verb.

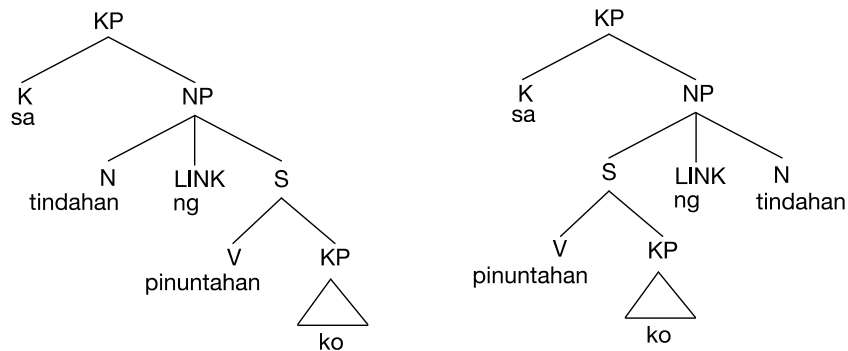


Figure 3. Syntactic diagrams representing the structure of (5a) and (5b)

Regarding nonrestrictive RCs, Schachter and Otnes gave a brief discussion in their Tagalog grammar published in 1972 (pp. 131–132). Nonrestrictive RCs in Tagalog must follow their head noun, and like in English, a pause intervenes between the RC and its head noun. In forming NR-RCs, the reversibility of the head noun and its relative modifier is impossible. In addition, the two types of RCs differ in that only the *na* form can be used as the linker in nonrestrictive constructions, whatever may be the final sound of its preceding word, given that the head noun and its nonrestrictive modifier are now functioning as two independent intonation phrases separated by a pause. The contrast between restrictive and nonrestrictive RC is illustrated by the following pair of examples (6a) and (6b):

- (6) (from Schachter & Otnes, 1972, p. 132)
- a. ang mga estudyante, **na** [nagtrabaho nang masikap]
 nom pl student link AV-perf-work ADV.link hard
‘the students, who worked hard...’ (NR-RC)
- b. ang mga estudyante=**ng** [nagtrabaho nang masikap]
 nom pl student=link AV-perf-work ADV.link hard
‘the student who worked hard...’ (R-RC)

I propose the following structure in Figure 4 for the nonrestrictive example (6a). In contrast to its restrictive counterpart structure presented in Figure 3, NR-RCs adjoin to the NP, and only right-adjunction is possible.

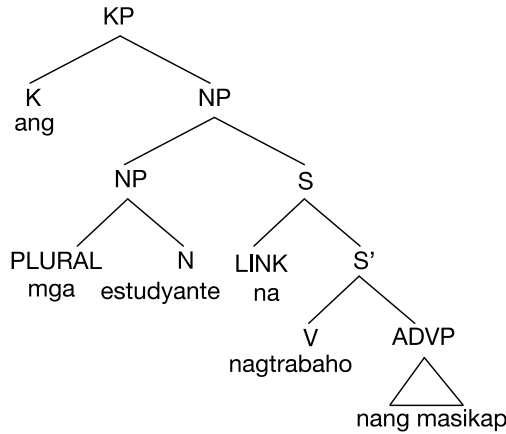


Figure 4. Syntactic diagram representing the structure of (6a)

Atayal¹⁷

In Atayal, restrictive RCs follow the head noun and the linker *ka?* intervenes between them, as shown in (7) and (8):

(7) (from Liu, 2005, p. 91)

Cyux	m-ʔuyay	qu?	kneril	ka?	[m-n-ihiy	yumin].
Aux.prog	AF-hungry	nom	woman	link	AF-perf-beat	Yumin

'The woman who has beaten Yumin is hungry.'

(8) (from Liu, 2005, p. 98)

Sy-on	na?	tali?	qu?	ʔasal	ka?	[q-aniq-an	sehuy	na?	sayun].
like-OF	obl	Tali	nom	house	link	eat-LF	taro	obl	Sayun

'The house where Sayun ate taros is liked by Tali.'

If we switch the relative order between the head noun and the relative modifier, as in (9), with the head noun following the relative modifier, the sentence becomes ungrammatical.

(9) (from Liu, 2005, p. 91)

*Cyux	m-ʔuyay	qu?	[m-n-ihiy	yumin]	ka?	kneril.
Aux.prog	AF-hungry	nom	AF-perf-beat	Yumin	link	woman

'The woman who has beaten Yumin is hungry.'

¹⁷ Atayal is an Austronesian Formosan language spoken in the north and mid-mountainous areas of Taiwan; the population is around 70,000 people.

According to Huang (2000) and Liu (2005), the linear order between the head noun and the relative clause is sensitive to topicalization. Therefore, R-RCs may precede their head noun if the head noun is exclusively marked as the topic of the sentence. As illustrated in (10a) and (10b), when the head noun is in topic position preceding the topic marker *ga?*, the R-RC can either precede or follow its head noun.

(10) (from Liu, 2005, p. 91)

- a. [M-n-ihiy yumin] **ka?** **kneril** **ga?** cyux m-ʔuyay la.
 AF-perf-beat Yumin link woman top aux.prog AF-hungry part
 ‘As for the woman who has beaten Yumin, (she) is hungry.’
- b. **Kneril** **ka?** [m-n-ihiy yumin] **ga?** cyux m-ʔuyay la.
 woman link AF-perf-beat Yumin top aux.prog AF-hungry part
 ‘As for the woman who has beaten Yumin, (she) is hungry.’

I propose the following syntactic structures in Figure 5 for the relative constructions in Atayal. The first diagram in Figure 5 illustrates the structure of (7), in which the R-RC appears postnominal. However, the aforementioned discussion claims that the topic construction licenses the surface form of a prenominal R-RC. The middle diagram in the figure corresponds to (10b), in which the R-RC and its modifying noun form an NP, and the entire NP receives the topicalized prominence. In the rightmost diagram, only the head noun is specifically topicalized, and the R-RC modifies the topicalized noun, the linker *ka?* now functions to link the R-RC to its topicalized head. This diagram depicts the structure of (10a), which shows an instance of prenominal R-RC.

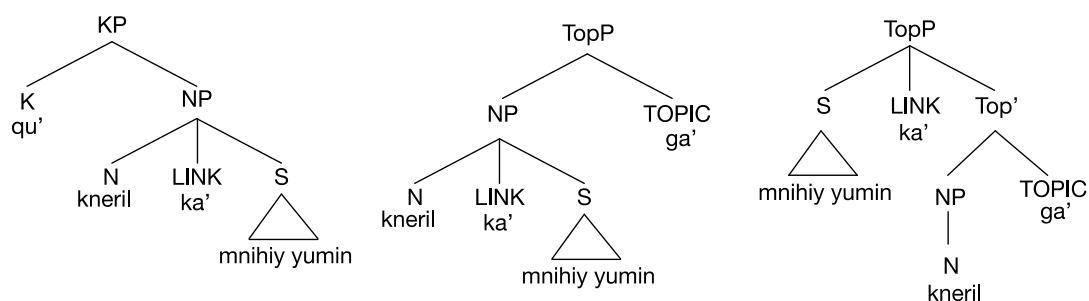


Figure 5. Syntactic diagrams representing the structure of (7), (10a), and (10b)

Nonrestrictive RCs, on the other hand, have the flexibility to either precede or follow their head noun under the condition that the linker *ka* is not present, as shown in (11):

(11) (from Liu, 2005, p. 93)

- a. Siy-on na? sayun qu? **tali?** Ø [m-n-anig mqu?].
 like-PF obl Sayun nom Tali AF-perf-eat snake
 b. siy-on na? sayun qu? [m-n-anig mqu?] Ø **tali?**
 like-PF obl Sayun nom AF-perf-eat snake Tali
 c. *Siy-on na? sayun qu? **tali?** **ka?** [m-n-anig m qu?].

like-PF obl Sayun nom Tali link AF-perf-eat snake
 ‘Tali, who has eaten snakes, is liked by Sayun.’

In (11), the example (c) contains an RC following its head noun, and an overt linker *ka?* occurs between the head and the modifier. According to Liu (2005: 93), native speakers do not accept this sentence; however, once the linker disappears, as in (11a) and (11b), the sentence becomes well-formed, and the RC may precede or follow the head noun. In this case the RC receives the nonrestrictive interpretation.

I propose that to account for the syntactic configuration of NR-RCs, the RC now can freely adjoin to the right or the left of an NP, as shown in Figure 6.

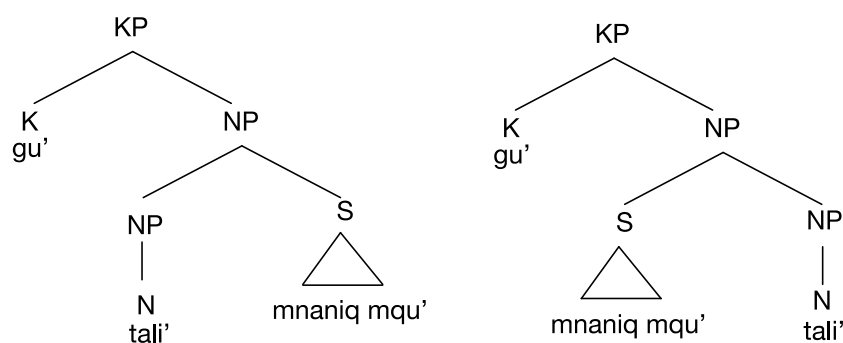


Figure 6. Syntactic diagrams representing the structure of (11a) and (11b)

The following pairs of examples (12) and (13) show the semantic distinction between restrictive and nonrestrictive constructions in Atayal. The restrictive clause in (12) implies that the speaker has more than one father, and that the speaker is mentioning a specific one among his many fathers, the one who has eaten snakes. In contrast, the nonrestrictive clause in (13) has no such implication.

(12) (from Liu, 2005, p. 94)

- a. **Yaba-mu?** **ka?** [wal m-aniq mqu?] **ga?** cyux pnepqulih.
 father-1s.gen link aux.pst AF-eat snake top aux.prog angle.fish
- b. [Wal m-aniq mqu?] **ka?** **yaba-mu?** **ga?** cyux pnepqulih.
 aux.pst AF-eat snake link father-1s.gen top aux.prog angle.fish
'My father who ate snakes is angling.' (*R-RC* → *more than one father*)

(13) (from Liu, 2005, p. 94)

- a. **Yaba-mu?** **Ø** [wal m-aniq mqu?] **ga?** cyux pnepqulih.
 father-1s.gen aux.pst AF-eat snake top aux.prog angle.fish
- b. [Wal m-aniq mqu?] **Ø** **yaba-mu?** **ga?** cyux pnepqulih.
 aux.pst AF-eat snake father-1s.gen top aux.prog angle.fish
'My father, who ate snakes is angling.' (*NR-RC* → *one father*)

The four trees in Figure 7 represent the syntactic structure of the above sentences in (12) and (13):

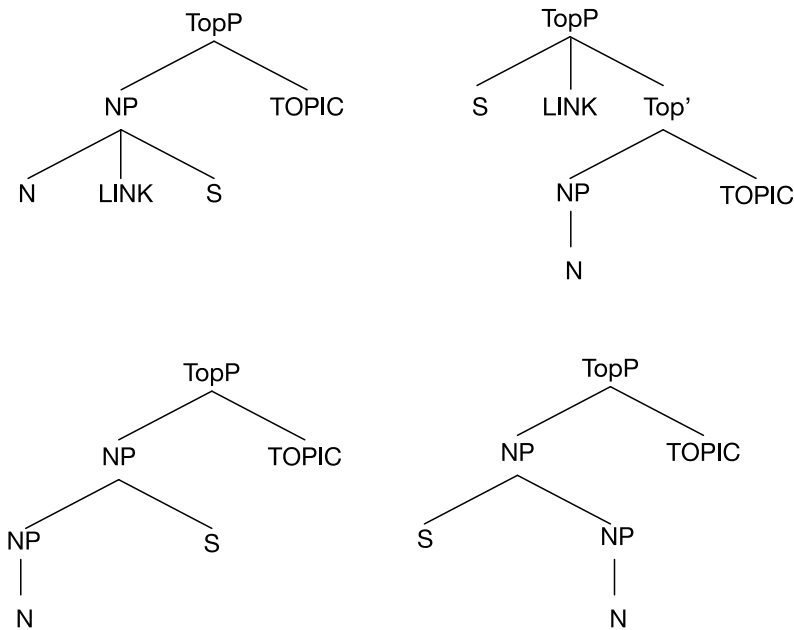


Figure 7. Syntactic diagrams representing the structure of (12) and (13)

Tsou¹⁸

Restrictive relative clauses in Tsou are by and large right-headed; that is, the clausal modifier precedes the head noun, and the linker *ci* appears between the R-RC and the head noun. Examples are shown in (14) and (15).¹⁹

(14) (from Zeitoun, 2000, p. 135)

Mo	okosi	ʔo	[i-si	ana]	ci	tacümü.
AF	small	nom	NAF-3s.gen	eat	link	banana

‘The banana which he ate is a small one.’

(15) (from Zeitoun, 2000, p. 136)

I-si	eobaka	ta	moʔo	si	[mo	ʔhatmadi]	ci
NAF-3s.gen	beat	obl	Moʔo	nom	AF	behave.improperly	link

oko.
child

‘Moʔo beat the child who behaved improperly.’

Huang, Su, and Sung (2001) mentioned that in fact we may find alternative ordering patterns between the head noun and their R-RCs in Tsou. As shown in (16), R-RCs in Tsou can optionally be left-headed or internal-headed; namely, the head noun can follow, precede or be inserted into its modifying RC, and the derived constructions are all accepted. However, they also claim that even with this ordering flexibility in the formation of RCs, Tsou shows a strong preference of right-headed R-RCs among its speakers.

(16) (from Huang, Su, & Sung, 2001, p. 44)

- | | | | | | | | |
|----|-----|------------|-------------------|-----------|------------|-----------|------------|
| a. | si | [mo | smovey | ta | oko] | ci | ino |
| | nom | AF | carry.on.the.back | obl | child | link | mother |
| b. | si | ino | ci | [mo | smovey | ta | oko] |
| | nom | mother | link | AF | carry | obl | child |
| c. | si | [mo | smovey | ci | ino | ta | oko] |
| | nom | AF | carry | link | mother | obl | child |
- ‘the mother who carries the child...’*

¹⁸ Tsou, spoken mainly in southwestern Taiwan, is a Formosan type of Austronesian language. It has approximately 5000 speakers.

¹⁹ Both Chang (1998) as well as Huang, Su, and Sung (2001) claimed that the case-marking system in Tsou is sensitive to semantic features such as [±visibility], [±proximity], [±definiteness], etc. Therefore, different case markers may be used with nouns that have different semantic properties.

The R-RC is right-headed in (16a) and left-headed in (16b). In (16c), the linker *ci* and the head noun are inserted into the structure of the relative clause.

According to Huang, Su, and Sung (2001), the use of right- or left-headed RCs is a matter of syntactic option for Tsou speakers, but there is no actual semantic distinction between them. When an RC involves multiple embedment, speakers prefer using left-headed to right-headed constructions. It is easier for them to capture the meaning if the head noun is presented earlier before its modifying phrase, which has been encoded with heavy information load. By contrast, internal-headed RCs are relatively rare. Based on their statistical data generated from four narratives about a short love story, they have observed a total of 53 relative clauses, but none of them is internal-headed (p. 49).

(17) (from Huang, Su, & Sung, 2001, pp. 46–47)

- a. Mo ümnü ?e [isi mü?a to [isi ümnüa ta [isi
 AF beautiful nom NAF grow obl NAF love obl NAF
 aiti ta voyu] ci **hahocngü**] **ci mamespingi** **ci büvnü**.
 see obl Voyu link man link woman link flower
- b. Mo ümnü ?e **büvnü ci** [isi mü?a to **mamespingi**
 AF beautiful nom flower link NAF grow obl woman
ci [isi ümnüa ta **hahocngü ci** [isi aiti ta voyu]]].
 link NAF love obl man link NAF see obl Voyu
*‘The flowers that are grown by the woman who is loved by the man who was
 seen by Voyu are beautiful.’*

All of the relative constructions involved in (17a) are right-headed, while those in (17b) are left-headed, and in both cases each head noun is modified by a structurally complex relative construction that is loaded with heavy information. Huang, Su, and Sung claimed that it took more time for a Tsou speaker to understand the meaning of (17a); therefore, they chose (17b) as a better expression over (17a), even though both are accepted as grammatical constructions.

I propose the following syntactic tree diagrams to illustrate the structures of (17a) and (17b) respectively in Figure 8 and Figure 9. As shown here, Tsou R-RCs and their head noun form an NP constituent that can be either left- or right-headed.

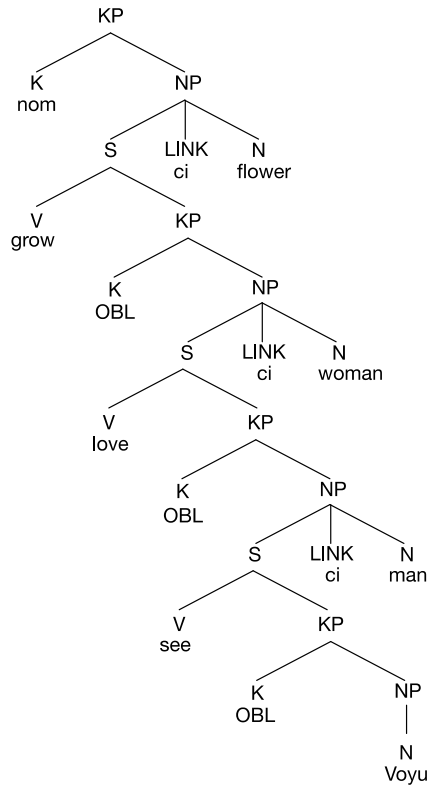


Figure 8. Syntactic diagram representing the structure of (17a)

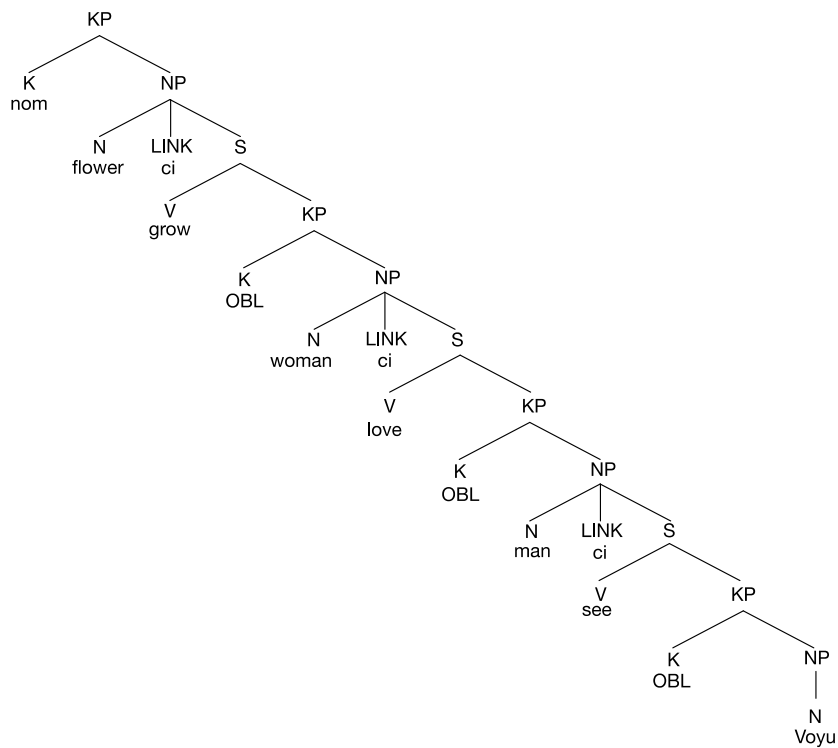


Figure 9. Syntactic diagram representing the structure of (17b)

Chang (1997) suggested that restrictive and nonrestrictive RCs in Tsou can be distinguished by the relative position of the relative clause and its head noun. In restrictive relative constructions, the head noun follows its modifier (prenominal RCs), as in (18), while in nonrestrictive relative constructions, the head noun precedes its modifier (postnominal RCs), as shown in (19).

(18) (from Chang, 1997, p. 69)

O-ʔu-cu aiti ʔo [o-si tposi to pasuya] **ci** **tposü.**
 NAF-I-already see nom NAF-he write obl Pasuya link book
'I have read the book that is written by Pasuya.'

(19) (from Chang, 1997, p. 69)

O-ʔu-cu aiti **tposü** **ci** ʔo [o-si tposi to pasuya].
 NAF-I-already see book link nom NAF-he write obl Pasuya
'I have read the book, which is written by Pasuya.'

The head noun in (19) appears to be outside the syntactic scope of KP, given the evidence that it precedes the case marker, which is supposed to be the first element of a head-initial KP. Comparing (18) and (19), I suggest that some sort of topicalized prominence has been assigned to the head noun so that the nonrestrictive meaning can be encoded and be distinguished from its restrictive counterpart.

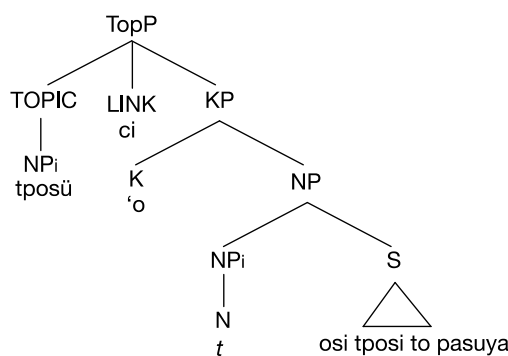


Figure 10. Syntactic diagram representing the structure of (19)

OT Generalization

The order of precedence between the head noun and the relative clause in these three particular languages can be summarized as follows:

I. Tagalog:

R-RC: HN precedes or follows RC

NR-RC: HN precedes RC

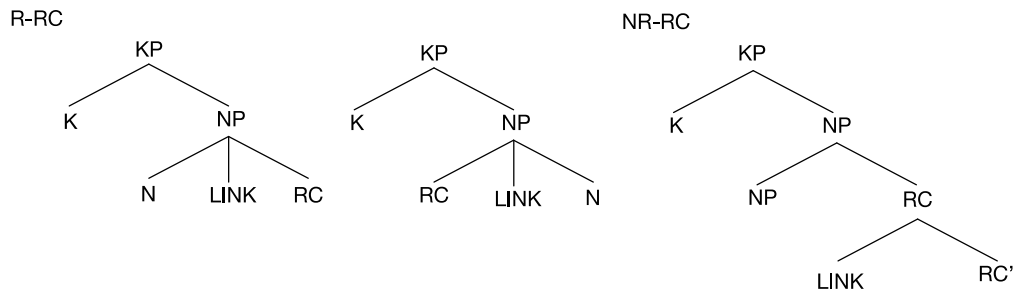


Figure 11. Restrictive and non-restrictive relative clauses in Tagalog

II. Atayal:

R-RC: HN precedes RC

NR-RC: HN precedes or follows RC

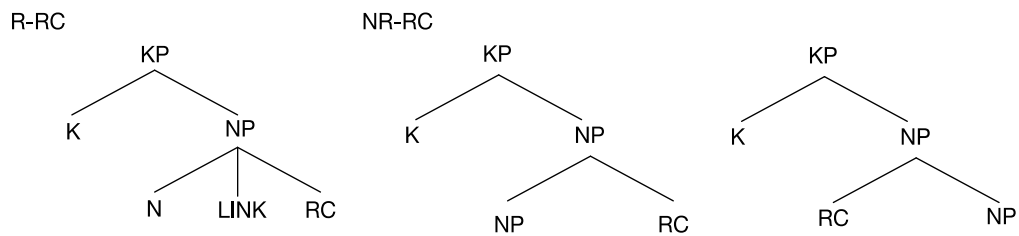


Figure 12. Restrictive and non-restrictive relative clauses in Atayal

III. Tsou:

R-RC: HN precedes or follows RC

NR-RC: HN precedes RC

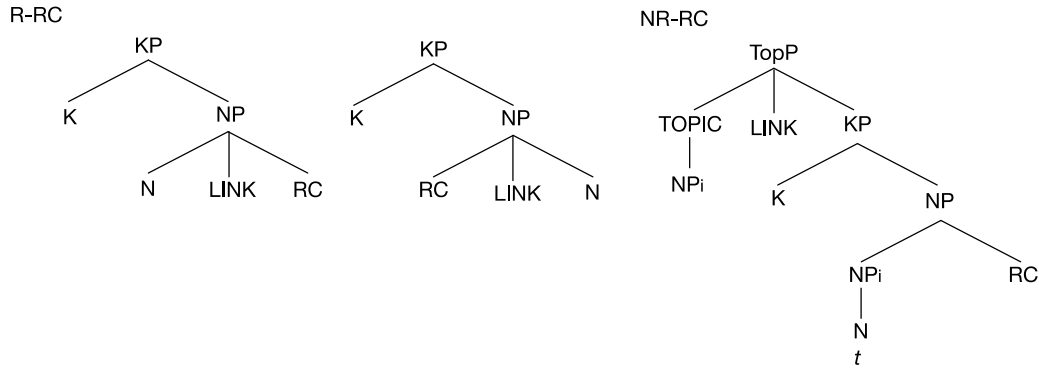


Figure 13. Restrictive and non-restrictive relative clauses in Tsou

Under the theory of UG, the surface diversity is argued to derive from the same underlying structure, as in Figure 14, which shows that the NP structure is left-headed, and adjuncts left adjoin to NP.

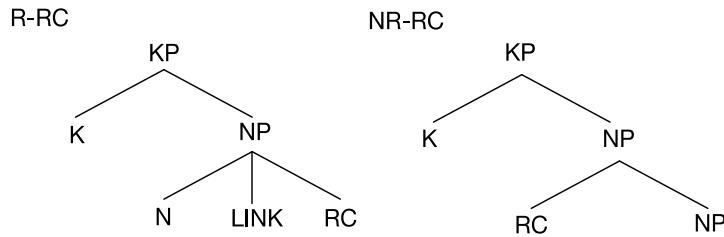


Figure 14. Underlying Structures for R-RC and NR-RC

The diversity of word order between HN and RC across the three languages is a result of the different placement of the same principle in their grammar. The principle is to establish topics at the initial position of NP, and the topic usually represents old information. The information carried by restrictive RCs is usually the old information, which is known or accessible to the speaker and hearer. It is the common knowledge shared by both the speaker and the hearer for identifying the head noun. Therefore, I propose that in restrictive relative constructions, the RC is the topic. By contrast, in nonrestrictive relative constructions, the HN is the topic, and the RC simply adds parenthetical information to modify the known topic.

In OT, the grammar of particular languages is illustrated by proposing different rankings on the same set of constraints; that is, constraints are universal while rankings are specific. In the cases of Tagalog, Atayal, and Tsou, we adopt the following generalized alignment constraints

(McCarthy & Prince, 1993a, 1993b) to account for their ordering variations between R-RCs and NR-RCs.

(20) *Generalized Alignment Constraints*

ALIGN-L (Head, NP): Align the head to the left edge of NP.

ALIGN-L (Topic, NP): Align the topic (old information) to the left edge of NP. In R-RC, the RC is the topic, while in NR-RC, the NP is the topic.

ALIGN-L (Adjunct, NP): Align the adjunct to the left edge of NP.

In Tagalog, the equal ranking between **ALIGN-L (Head, NP)** and **ALIGN-L (Topic, NP)** renders the flexible order of head noun and relative clause in restrictive constructions. On the other hand, the head noun must precede its relative modifier in nonrestrictive constructions because the constraint **ALIGN-L (Topic, NP)** outranks **ALIGN-L (Adjunct, NP)**, and thus the NP, being the topic information, must precede its modifier.

Table 1. Tagalog: **ALIGN-L (Head, NP)**, **ALIGN-L (Topic, NP)** >> **ALIGN-L (Adjunct, NP)**

Underlying Structure (32)	ALIGN-L (Head, NP)	ALIGN-L (Topic, NP)	ALIGN-L (Adjunct, NP)
☞ R-RC: N RC		*	
☞ R-RC: RC N	*		
☞ NR-RC: NP RC			*
NR-RC: RC NP		*!	

In Atayal, the constraint **ALIGN-L (Head, NP)**, which forces the head noun to precede its modifier, outranks **ALIGN-L (Topic, NP)**; therefore, the relative clause, being the topic of NP, has to follow its head noun in restrictive constructions. On the other hand, by proposing equal ranking between **ALIGN-L (Topic, NP)** and **ALIGN-L (Adjunct, NP)**, nonrestrictive RCs can flexibly precede or follow their modifying noun.

Table 2. Atayal: **ALIGN-L (Head, NP)** >> **ALIGN-L (Topic, NP)**, **ALIGN-L (Adjunct, NP)**

Underlying Structure (32)	ALIGN-L (Head, NP)	ALIGN-L (Topic, NP)	ALIGN-L (Adjunct, NP)
☞ R-RC: N RC		*	
R-RC: RC N	*!		
☞ NR-RC: NP RC			*
☞ NR-RC: RC NP		*	

The constraint hierarchy in Tsou is identical to the ranking proposed for Tagalog. The equal ranking between **ALIGN-L (Head, NP)** and **ALIGN-L (Topic, NP)** licenses the flexibility of word order in restrictive relative cases. However, since **ALIGN-L (Topic, NP)** is in higher ranking than **ALIGN-L (Adjunct, NP)**, nonrestrictive RCs cannot left-adjoin to NP, they have to follow NP.

Table 3. Tsou:ALIGN-L (Head, NP), ALIGN-L (Topic, NP) >> ALIGN-L (Adjunct, NP)

Underlying Structure (32)	ALIGN-L (Head, NP)	ALIGN-L (Topic, NP)	ALIGN-L (Adjunct, NP)
☞ R-RC: N RC		*	
☞ R-RC: RC N	*		
☞ NR-RC: NP RC			*
NR-RC: RC NP		*!	

One other thing to be noted here is that particularly in Atayal and Tsou, there is another kind of external topicalization that may manipulate the word order by triggering movement on the constituent that receives special pragmatic prominence to a topicalized position outside NP. In Atayal, the topicalization is formed by triggering the topicalized NP or the single N immediately to the left of the topic marker; in Tsou, the external topic position is licensed at the left of the entire KP. Whether the realization of topic prominence is achieved by an overt linguistic device or by a particular syntactic position is, again, a matter of parameter difference under the traditional generative view. By contrast, OT pursues the difference by arguing that the perceivable linguistic variation is derived from the competition of two kinds of universal forces that are conflicting in nature: the iconic principle prefers that each of the grammatical functions

is explicitly presented in the surface form with an overt linguistic indication; the economic principle aims to eliminate redundancy in pursuit of expressions that are as concise as possible. Therefore, by arguing that **Iconic** >> **Economic**, an overt topic marker must be present in Atayal, while the reverse ranking **Economic** >> **Iconic** applies in Tsou, triggering a particular topicalized position rather than a morphological marker to realize the pragmatic function. We will leave this point for future investigation.

Conclusion

In this paper, we adopt optimality theory to discuss concepts and issues in the theme of universal grammar. We introduce how the ideas of universal grammar and language variations are pursued in OT, a theory that is grounded in the generative tradition but not so widely adopted in the syntactic domain. In addition, this paper shows how OT reconciles linguistic constraints to account for language variations. We present a case study that involves three Austronesian languages to demonstrate the theoretical application of OT. In this case three manifestations of the generalized alignment constraints are hierarchically ranked in each specific grammar, which allows surface diversity to exhibit between relative clauses and their head noun across different languages. The constraint hierarchy is recaptured in (21).

(21) *Constraint Hierarchy of Tagalog, Atayal, and Tsou:*

Tagalog: ALIGN-L (Head, NP), ALIGN-L (Topic, NP) >> ALIGN-L (Adjunct, NP)

Atayal: ALIGN-L (Head, NP) >> ALIGN-L (Topic, NP), ALIGN-L (Adjunct, NP)

Tsou: ALIGN-L (Head, NP), ALIGN-L (Topic, NP) >> ALIGN-L (Adjunct, NP)

The ranking between ALIGN-L (Head, NP) and ALIGN-L (Topic, NP) determines whether a restrictive relative clause precedes or follows the head noun. A R-RC is the topic of its NP because it presents the old information; therefore, it precedes the head noun if the constraint ALIGN-L (Topic, NP), which favors the topic information to be presented at the phrase initial position, outranks ALIGN-L (Head, NP), which favors that the head noun appears to the left of other elements. By contrast, a R-RC follows the head noun if the two constraints are arranged the other way round. The higher ranking of ALIGN-L (Head, NP) over ALIGN-L (Topic, NP) renders the head noun in the precedence position over R-RCs. If the two constraints are equally ranked, both ordering possibilities are allowed.

On the other hand, the order between a nonrestrictive relative clause and the head noun is determined by the interaction of the two constraints ALIGN-L (Topic, NP) and ALIGN-L (Adjunct, NP). When a noun is modified by a NR-RC, the head noun appears to be the topic and the RC is an adjunct that provides additional information about the topic. Therefore, a NR-RC precedes the head noun if the constraint ALIGN-L (Adjunct, NP) is assigned higher ranking; by contrast, a NR-RC follows the head noun if the preferable ranking is assigned to ALIGN-L (Topic, NP). Again, their relative order is flexible if the two constraints receive equal ranking.

As demonstrated in this paper, the ordering variations between the head noun and the relative clause is well-explained in OT by proposing particular rankings for constraints and schema that appear to be universal. This shows how OT is theoretically adequate in explaining the concept of UG. The conflicting nature between language universals and linguistic variations can be resolved through constraint ranking and candidate competition.

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A Transitivity Investigation of *Nature* Journal Articles: Legitimizing First-person Use

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Abstract

This paper considers the use of first-person voice in scientific journal papers in relation to transitivity choices. We selected a sample of 10 papers from the journal *Nature* and conducted an analysis of each paper classifying the main verb of each clause into three categories: active voice, passive voice and be/have as main verb (i.e., neither active nor passive). We also identified and analyzed all uses of the first person, in light of the journal's instruction to authors to use the first person with an active verb. We discovered a striking contrast between use of the active/first person in the main body of the articles and the predominant use of the passive voice in the method section of the papers, which often appears as a full addendum below the paper. In the main body, the active dominates and there is regular use of the first person, although not equally across papers. This corresponds to the submission guidelines of the journal. However, we have observed a very different situation in the method sections, indicating that the choices being made cannot be totally predicted by current journal guidelines. In our discussion we identify powerful reasons for the use of transitivity choices for different purposes in specific contexts and at different stages of the argumentation. We conclude that quantitative data needs to be treated with caution and needs supplementing by a qualitative analysis which considers the choices made as the holistic argumentation of the paper develops.

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Keywords

Transitivity, First person, Self-regulation, Active, Passive

Two highly prestigious international scientific journals, “*Nature*” and “*Science*”, have taken an important non-traditional stance on the use of a first-person voice in scientific writing. They strongly encourage the use of the first person in conjunction with the active voice, explicitly linking this to clarity and direct communication. In Nunn (2014), I (*I* used here for the first author of this paper), already underlined the educational and conceptual importance of this practice. However, in the current context and beyond, there appears to be some confusion among students and indeed many faculty about how to use self-reference or even, in isolated cases, whether to use it at all. We have already identified (Nunn et al., 2012a, b) important strategic uses of the first person in the papers of one internationally published and prolific team of authors and in successful (prize-winning) students’ work. In Nunn (2014), I briefly referred to the guidelines of important scientific journals that are discussed in more depth here. These make unambiguous categorical statements such as, “Nature journals prefer authors to write in the active voice (“we performed the experiment...”)” (Nature, n.d., para. 4).

This study traced the transitivity choices within a selection of published texts in the journal *Nature* based on the view that authors have choices that are at least partially determined by the purpose of communication in context as the argumentation develops. Transitivity is the communicative means of representing actions, processes and arguments. When to show agency and when to emphasize an impersonal process is a choice that needs to be made in almost every sentence written so it cannot be avoided. If choices are made by prescription rather than as reasoned choices of argumentation there is a risk of misrepresentation that affects the perceived validity of the research itself. Tracing the holistic argumentation through a whole text is naturally time consuming, but an analysis of this kind needs to be done manually by a trained analyst, as computer software would not be able to interpret the subtle functional distinctions that our study requires. For example, forms such as ‘is elevated’ or ‘is subdued’ have the surface form of a passive voice, but trained human analysts can relatively easily distinguish between ‘elevated’ and ‘subdued’ as either adjectives or verbs in a textual context (see the literature review example below from a *Science* abstract). A third category of ‘be’ or ‘have’ as main verb is also important

in transitivity studies, as the assumption implicit in comparative quantification of just active/passive uses is highly problematic given the presence of a third choice which is neither of these. Admittedly, electronic corpus studies can identify first person uses just by searching for *we*, *us*, *our*, but they cannot classify the use functionally or situate it within a developing argumentation. The distribution of different phenomena across different parts of a text – and especially the contribution of a choice to the developing holistic argumentation of the paper – are of central importance to this study and cannot be determined electronically.

Using detailed analyses of a selection of papers from *Nature*, our quantitative and (primarily) qualitative investigation can be briefly summarized in the following questions:

1. What is the form, function and distribution of self-reference when it is used?
2. What is the form, function and distribution of an impersonal voice when it is used?
3. When is it ‘acceptable/accepted’ or even ‘preferable/preferred’ to use self-reference in the argumentation of a scientific text?
4. When is an impersonal voice an ‘acceptable/accepted’ or ‘preferable/preferred’ choice in the argumentation?
5. How is “acceptability” of a transitivity choice determined?

Our findings are applicable to teaching materials at all levels to ensure that future generations of scientific scholars are taught in a way that reflects a justifiable rationale of competent practice as practiced in prestigious international forums based partially on quantitative evidence of distribution, but mainly on qualitative evidence and analysis. In our local university context, as in most university contexts, developing academic argumentation skills is one of the main learning objectives of academic literacy courses and one that is needed by any scholar who publishes research in written form. Our work focuses on the characterization of critical reasoning in argumentation and has identified self-reference as an important function of transitivity. In this paper, we have developed the notion of transitivity in order to identify particular purposes of self-reference and first-person use and the way they contribute to argumentation. Currently there is some debate and uncertainty about the optimum usage of active and passive voices and the use of self-reference. This paper attempts to determine the implications of each choice at different stages of the argumentation in a research report.

An initial aim of this project was to investigate the extent to which the transitivity choices recommended in the submission guidelines of the journal *Nature*, which explicitly recommends first-person use, are practised in the articles that appear in the journal. This is important beyond

this particular journal as the relationship between the authors' own thesis and the reference to others' work through academic referencing is at the heart of academic literacy and argumentation. At the same time, the way language is used to reflect scientific reality is embodied in the transitivity system. The research investigated both qualitatively and quantitatively the transitivity distribution within a selection of twelve whole texts.

A brief review of relevant literature

Given that professional engineers are required to write reports and that engineering graduate students are encouraged to publish their research findings, future engineers increasingly require professional-level writing skills. Our previous projects have focused on the definition and identification of critical reasoning and argumentation skills as used by scientists and engineers in competent academic text. These studies (Nunn et. al, 2015; Deveci & Nunn, 2015), helped identify and classify the kinds of critical reasoning and argumentation that can usefully be developed for competent academic written communication. The relationship between authorial voice and reference to the voice of others through citation was studied in detail and a series of argumentation clusters were identified as examples of competent literacy practice. At the same time, the study highlighted the way language is used to reflect scientific reality as embodied in the transitivity system. While there are a variety of means available to authors to establish their own voice in a text, in this paper we have focused only on what is potentially the most transparent means, the direct use of a first-person pronoun.

Nunn et al. (2016) underlines the importance of 'self-regulation' as a superordinate critical thinking skill. This view is highly compatible with a systemic linguistic view of transitivity as a set of potential choices that an author must constantly make as their argumentation develops, transitivity being a means of representing scientific reality (Halliday & Matthiessen, 2004). The relationship between the authors' own assumptions, the so-called 'objectivity' of the study and the way language can provide the mere appearance of objectivity (objectification) are important concepts related to phenomenological and ontological epistemologies. A transitivity analysis provides a useful quantitative starting point for a qualitative investigation that has immediate practical consequences in that it links choices made to these concepts.

Hence our study also integrated insights from the philosophy of phenomenology (Smith, 2013) which provides an in-depth view of a first-person perspective. The philosopher Husserl (1931, 1960, p. 58) for example, in his seminal work on phenomenology, argues that what we appear to ‘know’ as universal absolute truths are mediated by “acceptance phenomena” which pass through “antecedent” human cognition and are also potentially subject to error. This is because “I can enter no world other than the one that gets its sense and acceptance or status [Sinn und Geltung] in and from me, myself” (p. 61). Liberman (2008, p. 350) writing from a social perspective about Husserl’s seminal work, suggests that “[t]he radical sense of “we,” the quantum “we” if you will, can be evaded only when our reflections remain strictly theoretical; however, as soon as we begin to address actual courses of reason in action, including scientific reason, the primacy of the “we” becomes obvious and is unavoidable.”

The ‘self’, it is argued, is never totally free of inter-subjectivity and what any researcher or philosopher claims to be ‘objectively’ known is unavoidably mediated through our own subjective and intersubjective identity. We (here the present authors, both individually and collectively) have earlier proposed that (individual) competence in academic literacy (Nunn, 2014, Deveci & Nunn, 2015) is inevitably linked to communities of practice. “We,” as members of an academic community, report our own work (potentially using an “I” or “we” perspective), refer to *other’s* work (often with an impersonal voice that may or may not be justified) and we propose “our own” or “my own” thesis in relation to what has apparently been commonly accepted by the community of practice.

It has already been established (Guo, 2012) that the first-person is frequently used in scientific writing and that specific purposes for its uses can be identified. It is also clear that style manuals have also moved in this same direction. The Chicago Manual of Style Online (2017) (which is recommended by IEEE, the referencing style commonly required by several engineering disciplines) currently argues against a totally impersonal voice:

As a matter of style, passive voice (the matter will be given careful consideration) is typically, though not always, inferior to active voice (we will consider the matter carefully). The choice between active and passive voice may depend on which point of view is desired. For instance, the mouse was caught by the cat describes the mouse's experience, whereas the cat caught the mouse describes the cat's. (p.5.115)

Similarly, the journal *Science* (n.d., para. 5) asks authors to use the active voice with the first person where appropriate, the example below indicating that the traditional preference for an impersonal form such as 'this team' or an impersonal active or passive form, would often be most appropriately conveyed with a simple "we" and active voice.

Use active voice when suitable, particularly when necessary for correct syntax (e.g., "To address this possibility, we constructed a λ Zap library...", not "To address this possibility, a λ Zap library was constructed...").

Our study offers a new dimension to these prescriptive recommendations by investigating the way authors in a leading international scientific journal (*Nature*) use self-reference and transitivity choice in the light of the journal's own recommendations.

As a brief example, in the recent *Science* abstract of Maher and Chamberlain (2014) below, the distribution of transitivity choices is as we might expect given the guidelines. Of the eight main clauses there is one passive, four active uses (including one first person use, "we propose") and three uses of "be" as the main verb. Of the infinitive uses, all are active (e.g., "to explain" rather than "to be explained"), with the exception of "to be regulated".

- (1) *Science* abstract (Maher & Chamberlain, 2014, p. 1502)

Earth's temperature is thought to be regulated by a negative feedback between atmospheric CO₂ levels and chemical weathering of silicate rocks that operates over million-year time scales. To explain variations in the strength of the weathering feedback, we present a model for silicate weathering that regulates climatic and tectonic forcing through hydrologic processes, and imposes a thermodynamic limit to weathering fluxes based on the physical and chemical properties of the river basin. Climate regulation by silicate weathering is thus strongest when global topography is elevated, similar to today, and lowest when global topography is more subdued, allowing planetary temperatures to vary depending on the global distribution of topography and mountain belts, even in the absence of appreciable changes in CO₂ degassing rates.

The first-person use has a clear strategic function in that it highlights an original contribution by the authors/researchers. By extension, given its location in the developing argumentation, what the model then does ('regulates') is associated with this authorial contribution. Similarly the double passive voice ('is thought to be regulated') indicates more general received knowledge. The choice of 'is thought' may also serve to distance the authors from the view expressed. This kind of example of competent argumentation highlights the constant transitivity choices that authors need to make as their argument develops. While the scientific knowledge is created through experiment, much of the argumentation is the authors' own.

The first person plural pronoun *we* has inclusive and exclusive functions. The former helps authors "form some kind of association with his/her audience" and "convey the message that what is being discussed is shared in an academic community, and therefore expresses solidarity with other scholars in a given field" (Deveci & Nunn, 2014, p. 2). Kuhl, Tofigh and Babaie (2013) identified the following functions of the inclusive *we*:

a) Creating audience involvement by indicating that the argument of the text is being built up by a collaborative writer/reader effort ... b) ensuring the reader to feel that they are part of “*joint enterprise*”... c) constructing dialogism between writers and the audience by making the discourse reciprocal. (p. 37)

On the other hand, exclusive *we*, as our argument above also indicates, is used to establish an authorial voice when used to highlight a contribution to the existing literature (Kuhi, Tofigh, & Mabaie, 2013).

We adopt ‘self-regulation’ (Facione, 2011, p. 6; Paul & Elder, 2010, 2017) as a superordinate concept of critical reasoning and argumentation that subsumes general critical thinking concepts such as analysis, synthesis, interpretation, evaluation and explanation and is closely related to metacognitive and meta-communicative ability. The developing argumentation of a paper when examined in terms of transitivity provides clues about the authors’ role not only in the text but also as the agent of the research being reported (Halliday & Matthiessen, 2004).

Methodology

We selected 10 papers from the *Nature* journal online site to conduct a detailed transitivity analysis. A variety of topics from a variety of the journal’s subsections were selected by an engineering graduate and co-researchers. They were selected to cover a range of the journals in the group from papers published in 2015 or late 2014. The following 10 papers made up the sample and will henceforth be referred to by number:

- [1] Miyata, Y., Nakayama, K., Sugawara, K., Sato, T., & Takahashi, T. (2015). High-temperature superconductivity in potassium-coated multilayer FeSe thin films. *Nature Materials*, 14, 775-779.
- [2] Li, L., Ye, G., Tran, V., Fei, R., Chen, G., Wang, H., Wang, J., Watanabe, K., Taniguchi, T., Yang, L., Chen, X. & Zhang, Y. (2015). Quantum oscillations in a two-dimensional electron gas in black phosphorus thin films. *Nature Nanotechnology*, 10(7), 608-613.
- [3] Hwal Shin, J., Hwee Kim, G., Kim, I., Jeon, H., An, T., & Lim, G. (2015). Ionic liquid flow along the carbon nanotube with DC electric field. *Scientific Reports*, 5, 11799.

- [4] Bailis, R., Drigo, R., Ghilardi, A., & Masera, O. (2015). The carbon footprint of traditional woodfuels. *Nature Climate Change*, 5(3), 266-272.
- [5] Long Han, Y., Liu, H., Ouyang, C., Jian, T. L, & Xu, F. (2015). Liquid on paper: Rapid prototyping of soft functional components for paper electronics. *Scientific Reports*, 5, 11488.
- [6] Jeon, N., Noh, J., Yang, W., Kim, Y., Ryu, S., Seo, J., & Seok, S. (2015). Compositional engineering of perovskite. *Nature*, 517(7535), 476-480.
- [7] Rivnay, J., Leleux, P., Hama, A., Ramuz, A., Huerta, M., Malliaras, G., & Owens, R. (2015). Using white noise to gate organic transistors for dynamic monitoring of cultured cell layers. *Scientific Reports*, 5, 11613.
- [8] Frederix, P., Scott, G., Abul-Haija, Y., Kalafatovic, D., Pappas, C., Javid, N., Hunt, N., Ulijn R., & Tuttle, T. (2014). Exploring the sequence space for (tri-)peptide self-assembly to design and discover new hydrogels, *Nature Chemistry*, 7,(1), 30-37.
- [9] Engineer, C., Ghassemian, M., Anderson, J., Peck, C., Hu, H., & Schroeder, J. (2014). "Carbonic anhydrases, EPF2 and a novel protease mediate CO₂ control of stomatal development. *Nature*, 513(7517), 246-250.
- [10] McGlade, C., & Ekins, P. (2015).The geographical distribution of fossil fuels unused when limiting global warming to 2 °C", *Nature*, 517(7533), 187-190.

We established the following stages of analysis:

1. Identifying all clauses as either active, passive or 'be'/'have' main verb clauses with double checking by different coders.
2. Recording their distribution in the different sections of the text (whether headed by a generic or non-generic heading) quantitatively. Where no headings were available paragraph numbers were used.
3. Identifying all first-person uses.
4. Recording their quantity and distribution in the different sections of the text (whether headed by a generic or non-generic heading) quantitatively.
5. Conducting a contrastive, qualitative analysis of the different functions and perceived purposes of all first person uses.
6. Elucidating the relationship between each first-person use and the use of reference to the work of other scholars qualitatively.

7. Conducting a contrastive analysis of the different function and perceived purpose of impersonal uses of language identified.

Results

Generic structure

Prior to presenting the most relevant findings, it is important to point out that *Nature* journal papers have an unusual generic structure in that the methodology section appears at the end of full research papers and is only briefly summarized in the main body of many papers, with the exception of some of the shorter report papers. Given that the stage in the argumentation is important to the choices made (Grice's Principle, 1989), we have therefore provided two (contrastive) analyses of each paper. One is for the main body of the paper, the other for the methodology section. We identified a striking contrast between use of the active/first person in the main body of the articles and the predominant use of the passive voice in the extensive methodology sections of the papers.

Brief quantitative analysis across ten papers

While we are mainly concerned with the transitivity choices made in terms of argumentation, some quantitative information allows us to consider the distribution of active/passive/first person use. Our brief quantitative discussion will focus on contrasting first-person uses in the method section and the main bodies (non-method) of the papers. We would, however, underline that quantities of passive versus active use and personal versus impersonal uses need to be interpreted with caution, as we will discuss in our qualitative analysis the way that the choice between the two depends on contextual factors each time the choice is made.

As can be seen in Figure 1 below, the active voice was the most frequent choice across papers, but was not more frequent in a majority of the papers.

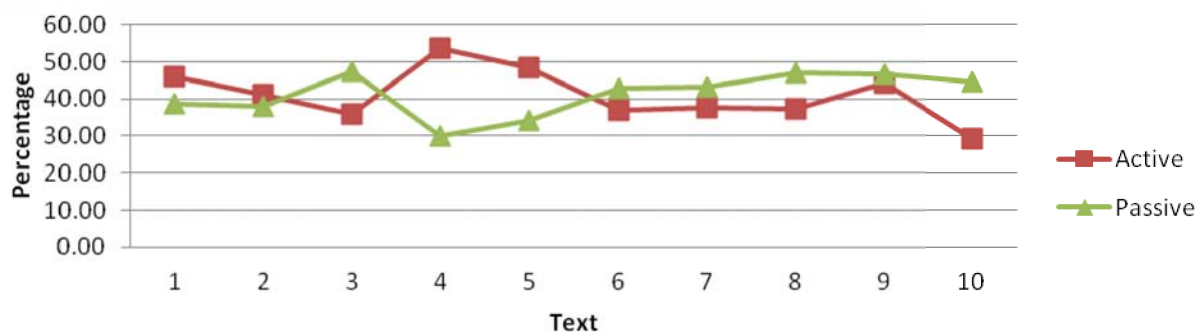


Figure 1. Comparison of active vs passive uses across papers

Figures 2 and 3 provide the clearest distributional breakdown, showing that the passive voice was used much more frequently than the active voice in the method section of almost all the texts, but dominated only in this section. In the non-method sections, it is clearly the case that the active voice dominated. Taken together, the data indicate that the authors of the ten texts we analyzed tended to opt more frequently for the active voice of their papers with the exception of the method sections. There was a clear preference for active use in the main body of the texts (non-method) in all but one paper.

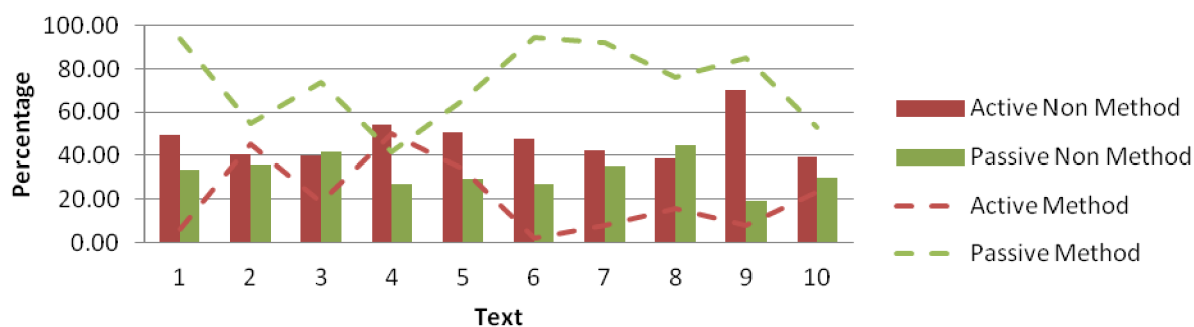


Figure 2. Comparison of non method vs method sections for active vs passive

Figure 2 further indicates that the dominance of the passive over the active in the method section is stronger than the dominance of active voice over passive in non-method sections. This warrants further qualitative exploration to interpret the effect (and therefore indirectly the purpose) of an active or a passive choice at different stages of the argumentation.

We also analyzed the use of the first person in our data set, and compared it to the use of the active/passive voice, the results of which can be seen in Figures 3 and 4. The least frequent use of first person was in the method sections (Figure 3).

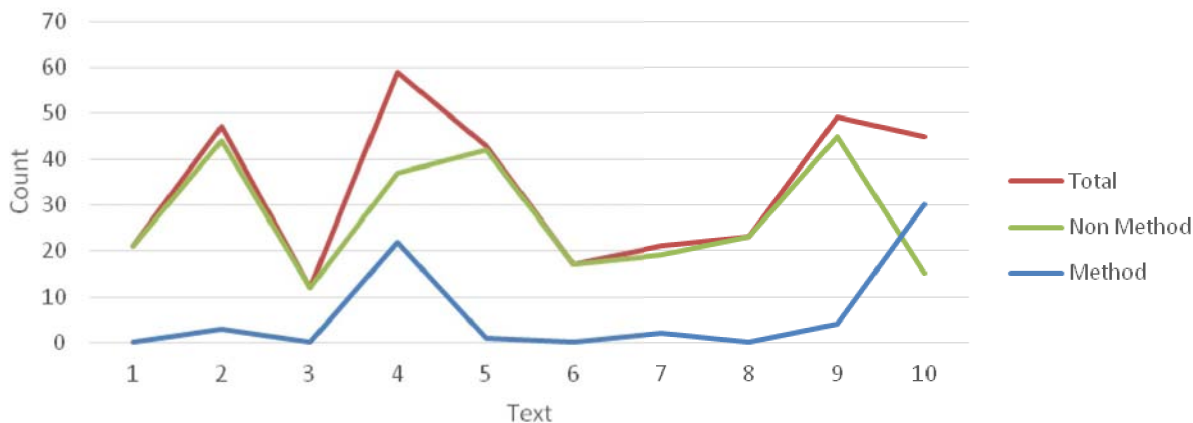


Figure 3. Comparison of first person word count in different sections

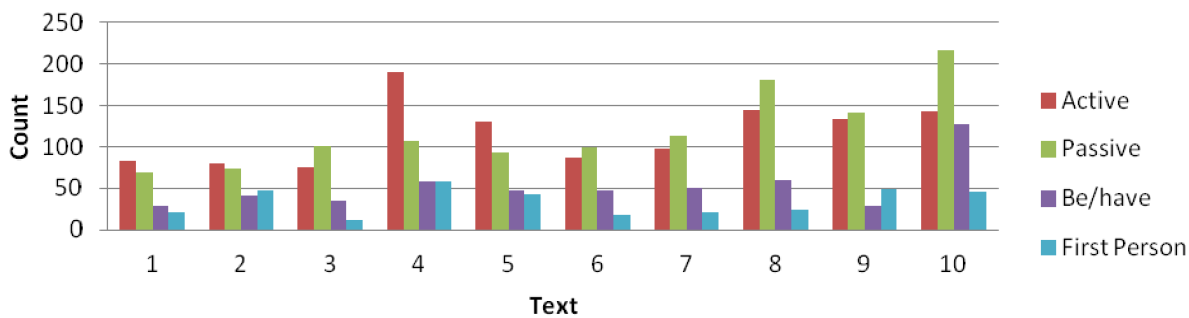


Figure 4. Comparison of active, passive, be/have and first person for the entire article

When the whole data set is considered (Figure 4), we also notice that the first person uses were far less frequent than total active voice uses. This is important because it is then clear that impersonal active use outweighs the personal active use.

Quantitative results of two papers

We now provide a contrastive analysis of a different style of paper from *Nature*, *The carbon footprint of traditional woodfuels*, written by Bailis et al. (2015). This article identifies potential areas of wood fuel driven deforestation in order to mitigate climate change effects (Article 4). It is important to note that this paper presents an original model based on a review of previous

studies. It is therefore an atypical paper in our sample and provides a useful contrast to help us draw conclusions about the effect and purpose of different transitivity choices made in an experimental research study. We will contrast it with an experimental paper (Engineer et al., 2014) which identifies mechanisms and genes that function in the repression of stomatal development in leaves during atmospheric CO₂ elevation. (Article 9). This paper is typical of the transitivity choices among the experimental studies analyzed.

The findings of this experimental paper (Article 9 in Table 1) indicated that self-reference was used frequently in the main body of the text. (See Appendix 1 for the full transitivity distribution in each section of the paper.) 32 of the 37 overt instances of the first person contained the subject pronoun *we*. Ten of these were in the two-paragraph discussion section. Elided uses of *we* were counted separately in cases where the verb shared the subject pronoun *we* with the previous verb, but are included as first-person uses in the tables.

Table 1. Transitivity in the main body of Article

Totals	Active	Passive	Be/have main verb	First person
177 clauses with main verbs	124 70.06%	33 18.64%	20 11.3%	43 (37 overt + 6 elided uses)

Tables 2 and 3 below (Article 4 then Article 9) clearly indicate that the passive voice is dominant in the methodology section of the experimental paper (article 9). Indeed, passive clauses in the Methodology section outnumber active by 107 to 10. A similar pattern was observed in the 8 other experimental papers analysed (see figure 1 above), all of which describe a step-by-step experimental process. In Article 4, the passive does not dominate in any section, including the methodology section. We note that no step-by-step experimental process is described in this paper. Nonetheless, in the section which outlines the (non-experimental) method in Article 4 the passive is proportionally more frequent than in other sections of the same paper.

Table 2. Transitivity distribution in a non experimental review paper (Article 4)

	Active voice	Passive voice	Be/Have	First person
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Abstract	9	3	6	6
Introduction	27	15	4	5
Pan-tropical wood fuel supply and demand	10	5	1	2
Wood fuels and LCC	25	15	3	11
Wood fuel sustainability	31	21	21	2
GHG emissions	11	2	6	0
Mitigation potential of efficient cookstoves	9	6	0	2
Discussion and implications	32	10	11	9
Methods	36	30	6	22
Total	190	107	58	59

First-person usage totaled 59 (15.5% of the total number of clauses) and 49 (16.2%) in Articles 9 and 4, respectively. In Article 9 most of the first-person usage was in the main body with just 8.2% of first-person uses in the methods section, while in Article 4, 37.3% were in the (non-experimental) methods section. There is a marked difference in the quantity of passive use between the Discussion and Implications section and the Method section in Article 4.

Table 4 gives an overview of the total distribution of the clauses across the two articles. We have already indicated (Tables 3 & 4) that the total use is misleading. Article 9, for example, has a higher total usage of passive clauses (47%) than active (44%) due only to the large use of passive in one section, the method section, which is also physically separated in that it appears below the the main body rather than as a section within the paper. As discussed in the overall quantitative analysis above, the distribution is critical to interpreting the figures. We also note that there are not many headings used in Article 9. There is a very marked distinction between the transitivity use in the main body of the paper (where the active dominates strongly) compared to the methodology section which appears after the main body of the paper (where the passive dominates strongly).

Table 3. Transitivity distribution in an experimental research paper (Article 9)

	Active voice	Passive voice	Verbs to be/have	First person
Abstract	19	2	2	4
Introduction	5	1	1	0
Main Body	99	27	16	41

Methods Summary	1	4	0	0
Methods	10	106	9	4
Total	134	140	28	49

Table 4. Clause types and distribution across both articles

	Active voice	Passive voice	Verbs to be/have
Article 4	54 %	30 %	16 %
Article 9	44 %	47 %	9 %
Average	49 %	37.5 %	12.5 %

Qualitative discussion of selected extracts

Our qualitative discussion attempts to address the following questions:

1. What is the form, function and distribution of self-reference when it is used?
2. When is it ‘acceptable/accepted’ or even ‘preferable/preferred’ to use self-reference in scientific text, based on textual evidence and qualitative analysis?
3. When is an impersonal voice a ‘preferable/preferred’ choice?

Examples (2-5) below are taken from the experimental paper (Article 9). There are no page numbers in the online versión of *Nature*. We use the following colour coding conventions:

Red = references

Green = first-person

Blue = active

Purple = passive

Yellow = Verb to be/have as main verb

- (2) Intensive use of first-person and active voice in a discussion section (Article 9)

We hypothesized that there is a distinct extracellular protease(s) that mediates CO₂ control of stomatal development. SDD1 belongs to a 56- member subtilisin-like serine protease family (subtilases). Therefore, we pursued proteomic analyses of apoplast proteins in leaves and [we] identified four abundant subtilases (SBT1.7 (also known as ARA12), SBT1.8 (At2g05920), SBT3.13 (At4g21650) and SBT5.2; Extended Data Fig. 5). Because SBT1.7 has been shown to be required for seed mucilage release²⁸ and SBT3.13 was detected in two of five experiments, we focused on SBT5.2 rather than SBT3.13, SBT1.7 or its closest homologue, SBT1.8. Interestingly, qPCR data from developing cotyledons showed an increase in the abundance of SBT5.2 transcripts in WT plants after both long term (5 days; Fig. 3b) and short term (4 h; Extended Data Fig. 5f) exposure to the elevated CO₂ concentration. By contrast, the ca1 ca4 plants failed to show this increase in SBT5.2 transcript abundance at the elevated CO₂ concentration (Fig. 3b). We named SBT5.2 as CRSP (CO₂ RESPONSE SECRETED PROTEASE). CRSP is widely expressed in guard cells and meristemoid- and pavement-cell-enriched samples, as well as in other plant tissues, including high expression in roots^{17,29}. Our experiments with a CRSP–VENUS construct showed that CRSP is targeted to the cell wall (Extended Data Fig. 5c, d). We tested the effect on CO₂ control of stomatal development of two T-DNA insertion alleles encoding mutated forms of this extracellular protease (Fig. 3c and Ex- tended Data Figs 1b, 3, 4 and 5e).

As already established, in the whole of the main body, the active voice dominates and there is regular use of the first person. This corresponds to the submission guidelines of the journal. In extract 4 (2) above, agency is established with great clarity. We note that the discussion starts in the form of a hypothesis, “we hypothesize” , which we classify as metacommunication and makes the authors’ own metacognitive processes transparent. The authors also provide transparent agency of experimental decisions made in “we pursued proteomic analyses... and identified four abundant subtilases.” The communicative effectiveness of indicating their own agency can also be seen contrastively in “Because SBT1.7 has been shown to be required for seed mucilage release²⁸ and SBT3.13 was detected in two of five experiments, we focused on SBT5.2 rather than SBT3.13”.

Here the passive is used contrastively to indicate the agency of other researchers (ref. 28). Hence the use of the first person also has a contrastive function which results in greater transparency. This adds to the clarity of the text as agency is clearly identifiable. “We named SBT5.2 as CRSP...” again indicates the novel contribution which reinforces the relevance of this paper to the academic community.

Similarly extract (3) below illustrates the predominance of active use and the frequent use of the first-person voice which represents a typical pattern in the whole main body of the text (70 % of all clauses).

(3) Typical main body extract (Article 9)

Environmental stimuli, including elevated carbon dioxide levels, **regulate** stomatal development¹⁻³; however, the key mechanisms mediating the perception and relay of the CO₂ signal to the stomatal development machinery **remain** elusive. To adapt CO₂ intake to water loss, plants **regulate** the development of stomatal gas exchange pores in the aerial epidermis. A diverse range of plant species **show** a decrease in stomatal density in response to the continuing rise in atmospheric CO₂ (ref. 4). To date, one mutant that **exhibits** deregulation of this CO₂-controlled stomatal development response, *hic* (which **is** defective in cell-wall wax biosynthesis, ref. 5), **has been identified**. Here **we show** that recently isolated *Arabidopsis thaliana* b-carbonic anhydrase double mutants (*ca1 ca4*)⁶ **exhibit** an inversion in their response to elevated CO₂, showing increased stomatal development at elevated CO₂ levels. **We characterized** the mechanisms mediating this response and **identified** an extracellular signalling pathway involved in the regulation of CO₂-controlled stomatal development by carbonic anhydrases. RNA-seq analyses of transcripts **show** that the extra-cellular pro-peptide-encoding gene EPIDERMAL PATTERNING FACTOR 2 (EPF2)^{7,8}, but not EPF1 (ref. 9), **is induced** in wild-type leaves but not in *ca1 ca4* mutant leaves at elevated CO₂ levels. Moreover, EPF2 **is** essential for CO₂ control of stomatal development. Using cell-wall proteomic analyses and CO₂-dependent transcriptomic analyses, **we identified** a novel CO₂-induced extracellular protease, CRSP (CO₂ RESPONSE SECRETED PROTEASE), as a mediator of CO₂-controlled stomatal development. **Our results identify** mechanisms and genes that **function** in the repression of stomatal development in leaves during atmospheric

CO₂ elevation, including the carbonic-anhydrase-encoding genes CA1 and CA4 and the secreted protease CRSP, which cleaves the pro-peptide EPF2, in turn repressing stomatal development.

In extract (3), the first person use indicates the agency of the authors when they report doing something new resulting in a novel finding as in: “we identified a novel CO₂-induced extracellular protease, CRSP (CO₂ RESPONSE SECRETED PROTEASE), as a mediator of CO₂-controlled stomatal development.” Similarly “our results identify” indicates a new finding. In their detailed discussion of relevance theory, Sperber and Wilson (1995) refer to a guarantee of relevance, which is a guarantee that the author can be assumed to be proposing something new in relation to what a reader already knows. While the passive is used in limited cases only (17.5% of all clauses), it is frequently used contrastively in conjunction with a reference, i.e., someone else’s work, as in: “To date, one mutant that exhibits deregulation of this CO₂-controlled stomatal development response, hic (which is defective in cell-wall wax biosynthesis, ref. 5), has been identified” where the passive “has been identified” refers to the authors of reference 5. We also note here that impersonal active use (which outweighs personal active use in all papers) is also used in a similar fashion throughout this extract.

Use of the passive voice. In contrast, when we move to the method section, even a rapid glance at the colour coding of extract (4) below clearly indicates a massive dominance of the passive. The passive here is used to describe an experimental process.

- (4) Typical method section extract (Article 9)
- Rosettes of 10 soil grown plants (8 weeks old, or in the case of cotyledon apoplast extraction, cotyledons and hypocotyls from 5-day-old seedlings) were vacuum-infiltrated with 0.3 M mannitol for 2 min at room temperature, after which leaves were centrifuged at 200g in a swinging bucket rotor at 4 uC for 15 min. The same leaves were re-infiltrated with 0.2 M CaCl₂ in 0.3 M mannitol for 3 min under vacuum at room temperature, after which the leaves were centrifuged at 200g in a swinging bucket rotor at 4 uC for 20 min. The pH of this extraction buffer was varied between 4 and 9 to maximize the capture of proteins based on their predicted pKa values. The centrifugation step produced 19 ml apoplast fluid, which was separated on an Amicon Ultra-15 filter column (15 ml capacity) in a swinging bucket rotor at

4,100 r.p.m. and 4 uC. The flow-through was passed through the column three times, resulting in a final volume of 300 ml in the filter cup. Protease Inhibitor Cocktail (Sigma, 30 ml) was added to the 300 ml protein sample. The 300 ml protein sample was then acidified with 1% trifluoroacetic acid (TFA) to a final concentration of 0.1% TFA. ZipTip pipette tips (Millipore) were used according to the manufacturer's protocols, and protein samples were eluted in an acetonitrile dilution series as follows: 5, 10, 20, 30, 40 and 50% acet- onitrile in 0.1% TFA. The samples were desiccated and re-dissolved in 0.1% TFA and 5% acetonitrile. The peptides were then extracted and desalted using Aspire RP30 desalting columns (Thermo Scientific). For the isolation of secreted cysteine- rich peptides, two separate experiments including WT and ca1 ca4 seedlings or WT and crsp-1 seedlings were cultured in 0.53 MS liquid medium under constant agitation and light for 10 days. Secreted proteins from the liquid growth medium were size-fractionated to isolate peptides of 3–10 kDa using Amicon Ultra-15 filter columns. Cysteine-rich peptides were purified on Thiopropyl Sepharose 6B (Sigma) with and without a dithiothreitol pre-reduction step. The eluted and flow-through samples were analysed as described below. We attempted several proteomic approaches (including 35S promoter-driven EPF1 and EPF2 overexpression, inducible oestradiol-mediated overexpression of EPF2, liquid culture of seedlings followed by enrichment of cysteine-rich secreted peptides, and analysing the apoplast proteomes of 5-day-old cotyledons and hypocotyls) and did not detect these low abundance EPF peptides from in planta samples.

While Extract 4 is a typical method-section extract given that, in this section of the paper, 84% of all clauses are in the passive, the authors agency does appear in “We attempted several proteomic approaches ... and did not detect...”. This use is similar to the use in the main body where the authors use first person to indicate key experimental decisions that they made in relation to the more impersonal sequential process.

We have already established that the greatest proportional use of the passive voice was in the methods sections of experimental papers. This is further illustrated in extracts (5) and (6) below.

- (5) Impersonal transitivity (passive voice use; Article 4)

We assume a threshold of 12-hour one-way travel. When several consumption sites are considered simultaneously, the woodshed is determined by the aggregate demand from all sites.

Extract (5) illustrates an interesting contrast between the personal active use representing a thought process (“we assume”) and the more factual statements that follow in the passive voice.

- (6) Impersonal transitivity (passive voice use; Article 4, p. XX)
RapiGest SF (Waters) was added to the mixture to a final concentration of 0.1%, and the samples were boiled for 5 min. Tris-(2-carboxyethyl) phosphine (TCEP) was added to a final concentration of 1 mM, and the samples were incubated at 37 uC for 30 min.

Extract (6) further illustrates the most frequent usage of passive across our sample, where a sequential experimental process is reported. This corresponds to earlier findings (Nunn, 2014) in the analysis of science papers from a different journal.

Use of the impersonal active. The greatest proportion overall of transitivity use was in the active voice. However, most of the uses were impersonal uses rather than expressing the agency of the author. Personal and impersonal use is shown in extracts (7-9) below. Extract (7) illustrates the way a first person pronoun is used to make it clear that this is their own assumption/estimation. The impersonal use that follows illustrates a physical phenomenon in which “combustion” is seen as an agent causing global emissions. The combination of the two is important here in that the impersonal scientific information “using the best available data” is presented as a personal estimate by the authors.

- (7) Contrast between personal and impersonal active voice (Article 4)
Using the best available data, we estimate that unsustainable harvesting and incomplete combustion contributed 1.9–2.3% of global emissions of well-mixed GHGs and SLCFs in 2009.
- (8) Use of impersonal active voice (Article 9)

These analyses and independent single gene quantitative PCR (qPCR) studies of developing cotyledons **showed** that elevated CO₂ **induced** upregulation of transcripts of EPF2 (which **encodes** an extracellular pro-peptide ligand, 7,8) in WT plants but not ca1 ca4 plants.

Extracts (7) and (8) provide only impersonal scientific explanations or descriptions of results, but they are in the active voice. From these and similar extracts such as extract (9) below, we have concluded that it is not possible to equate active only with personal uses although most personal uses do come with a subject pronoun *we* and an active verb form.

- (9) Further intensive use of impersonal active voice (Article 9, p, XX)
The cell itself **works** by utilizing a flow of oxygen to either dissociate interfering species or to coalesce with the species of interest for suitable resolution. For example ArC⁺ (present at m/z 52) created within the plasma itself **interferes** with Cr⁺ at m/z 52. Oxygen gas in the DRC **dissociates** ArC⁺ and thus **suppresses** the interference. On the other hand, As⁺ (at m/z 75) **binds** to oxygen to form a complex adduct.

Use of first person. We have already emphasized our view that the first person usage reflects the authors' agency, often related to a novel contribution to the research field. It is used to clarify what exactly is contributed by the authors/researchers as illustrated in extracts (10) and (11) below. We note that the passive is sometimes used contrastively for scientific explanation or definition.

- (10) Use of first person to indicate a novel contribution (Article 4)
Woodfuel supply **is defined** by the productivity of woody biomass, which **we model** as a function of above-ground biomass (AGB) stock. **We use** recent maps of land cover and ecological zones to define a broad system of land units, including cropland and crop mosaic (often **neglected** in assessments of wood fuel supply).
- (11) Use of first person to indicate a novel 'invention' and procedure (Article 9)

To determine whether the EPF2 pro-peptide can be cleaved by CRSP, we constructed two synthetic peptides spanning the predicted EPF2 cleavage site. We subjected these peptides to in vitro proteolytic analyses using in vitro-synthesized CRSP protein.

Conclusions

An interesting generic feature of *Nature* journal papers is that they often separate an extensive method section placing it below the main body of the paper. Method is only referred to in the main body in conjunction with discussion of the results. It is therefore the original findings that are emphasized alongside the way the authors achieved these findings. This separate method section totally disrespects the journal's explicit drafting instructions as the passive always strongly dominates. However, neither of the sections precludes other choices. There is a selective use of passive in the main body where active dominates. A selective use of active (including with first person) is found in the method section where the passive dominates. We used a detailed analysis of Article 9 to highlight the contrast. While in the main body of Article 9, 70.5% of all clauses were in the active and only 18% in the passive, in the separated methodology section, 84.5% of all clauses were passive and only 8.2% active. In the main body there were 37 clear first person uses and six elided uses which are easily identified. In the long methodology section there are only two. The contrast is therefore striking. This supports our view that the authors are seen to self-regulate in that they use their own judgement in order to make appropriate choices as their argumentation develops. These are clearly not totally free choices, but it is still impossible to pre-determine a particular choice without considering the purpose at a particular stage of the argumentation.

We therefore believe our analysis permits a strong provisional conclusion. The competent choice between active and passive (or neither) is always one that is context dependent and varies according to the stage of communication. Hence a methodology stage indicating a routine step by step process is likely to be in the passive regardless of the journal's instruction but not invariably in every clause. There is a reasonable explanation for this. Namely, that there is no need to emphasize the author/researchers' agency or voice at this stage of communication. It may even be inaccurate to do so as authors/researchers are unlikely to physically conduct every stage themselves. The need to emphasize a process rather than a personal agent is simply more important at this stage of the report.

While we can observe a regular quantitative pattern, there is therefore always the option available to the authors to use a passive voice in the main body and an active voice with first person in the methodology section. We have found that there is an identifiable purpose in all cases and that this purpose can be deduced from the context of the ongoing argumentation.

While we cannot therefore devise simple categorical instructions for authors for drafting papers, some choices are clearly ‘preferred’ at particular stages of a report. The instructions issued by *Nature*, if they even imply that a first person with an active verb is always preferred, are simply not tenable or borne out by the evidence in their own published papers. It may nonetheless serve a useful purpose in that it requires authors to consider using a form they may have previously avoided. In our view, authors have only used a first person for an appropriate purpose at the stage of their argumentation.

Rather, like more traditional instructions to use only the passive in scientific writing, the instruction is perhaps too categorical. We cannot find any evidence in our analysis to suggest that the passive use is inappropriate when used. We did find a clear purpose for its use to describe a step by step process where the experimental procedure needs to be emphasized: something we have observed in all our scientific text analyses both in these and in other journals. The use of passive with a reference to literature in contrast to an original contribution by the authors with a first-person active also results in greater clarity. The instruction is therefore not explicitly followed in any section of *Nature* papers, and is totally flouted in the methodology sections, but this does not lead to any functional linguistic difficulty that we could identify in their published articles, which appear to be expertly drafted as regards transitivity choices. We conclude that the spirit of the law, rather than the letter of the law, takes precedence.

We further conclude that both journal editors and technical/scientific writing instructors need to be aware that transitivity use is complex and it is unwise to suggest or even imply that *only* one available choice could be used to draft a text. Competent professional authors are aware of the choices and select the most appropriate in the context of their self-regulated argumentation as the paper develops stage by stage. We cannot provide a deterministic rule, as argumentation by specialists is complex and detailed. Subtle distinctions cannot be predicted in advance. However, we believe that our study can help authors themselves determine when it may be appropriate to choose one over the other.

We conclude that adjacent contrastive transitivity choices enhance the clarity of a text. From a phenomenological perspective, authors have to situate themselves, along with their own actions and thoughts, in relation to knowledge already established by other members of an academic community. Establishing a balance between the thinking, knowledge and experimentation of others and our own is at the heart of academic literacy. To show we have made a relevant novel contribution, we need to situate our own agency in relation to what has already been done by others.

Transitivity analysis of the type we have briefly presented here provides evidence that content knowledge and its communication are inextricably related. It also provides evidence that there is no simple formula for authors to follow. Every clause we write requires us to make a transitivity choice and each choice is inextricably linked to the way we need to represent our (scientific) research process in the interests of transparency and clarity. We have argued in this paper that hiding behind impersonal language does not lead to greater scientific clarity. While there is no ready-made formula, apprentice authors who are able to analyze texts in their own specializations for both language use and content in order to develop their own expertise in presenting their scientific argumentation may have an advantage in managing to publish their original work.

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Appendix: Sample quantitative analysis of a complete paper

Table A1. Sample quantitative analysis of a complete paper – main body of the paper (Article 9).

Para. no. + word count	Active	Passive	Be/have (as main verb)	First person
Para 1 313	19	2	2	4
Para 2 132	5	1	1	0
Para 3 251	10	5	1	3
Para 4 103	5	0	0	2
Para 5 226	9	1	2	3
Para 6 116	5	0	0	2
Para 7 154	8	1	3	1
Para 8 179	6	1	2 (have)	4
Para 9 209	9	3	2	2
Para 10 359	13	6	4	6 1
Para 11 172	8	3		4
Para 12 181	8	0	1	2
Para 13 157	9	3	0	1 2
Para 14 163	9	4	1	0
Methods summary (para 15)	1	4	0	0
Totals in main body of paper	124	33	20	43
177 main verbs	70.5%	17.9%	11.6%	(24.3%)*

*The first-person % is a % of the total number of clauses

Table A2. Method section of Article 9 (located below the main body of the paper). This is an expansion of the Methods row from Table 3.

Paragraph (heading) and word count	Active	Passive	Be/ have (as main verb)	First person
Statistical analyses. 144		5	0	0
Stomatal development analyses RNA-seq and qPCR analyses 112	3	14	3	
Primer sequences 92	0	5	0	0
In vitro cleavage of synthetic EPF peptides. 71	1	1	3	1
The synthetic EPF2 192	1	3	1	0
Oestradiol induction of EPF1 and EPF2 102	1	9	0	0
Apoplast and secreted protein isolation. 409	0	5	0	0
Sample trypsinization 349	3	19	0	2
Alternative protocol 469	0	20	1	0
Totals 2536	10 8.2%	106 84.4%	9 7.4%	3

Language as a Window into Discrimination: A Corpus Linguistic Analysis of Hatred

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Abstract

There is perhaps no better way to gain an insight into a society than to observe the language it uses. And there is no better way to analyze such a discourse than to use large representative language corpora available today. Following this claim, I wish to propose a hypothesis that the extent of discrimination in one society (a very important topic at this point in time of global migrations) can be linked to the extent to which discriminatory expressions are used in everyday communication in that given society. To demonstrate the empirical attestability of this hypothesis, I will offer an analysis of the extent of discriminatory expressions within four South-European languages (and by hypothesized correlation also societies), namely in German, Romanian, Serbian, and Slovenian.

Keywords

Discrimination, Race, Gender, Sexual orientation, Discourse, Corpus linguistics, Politeness, Microaggressions, Populism, Right-wing rhetoric, Prejudice

With the heightened incidence of racial discrimination in the era of global migration and spill-over anti-immigrant sentiments in countries increasingly electing populist leaders, an important

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factor to consider is how we as societies linguistically deal with these issues. This is a crucial question since few things represent a society better than the language it uses. This comes as a fact if we consider that the only relevant reality is the one constructed by and through language (Teubert, 2010). Verbal interaction is what allows human social groups to be infinitely complex, as humans are unique in that they constantly negotiate the content of their reality collectively (Skinner, 1957). The meanings language conveys are in that way not representations of the real world: they are agreed-upon paraphrases of the world, as we communally comprehend it within one general distinctive discourse shared among communities using different underlying discourses (Teubert, 2010). These paraphrases are not only negotiated at the points of immediate conversations, but rather rely upon everything previously communicated within one language community -- as well as on our panhuman and pancultural mapping of our surroundings, feelings, and experiences. Hence, language is extremely social in character (Foucault, 1980). As such, it is indeed the most unique and most empirically accessible representative of the society that uses it, representative of the ideas and beliefs of the society that uses it, ideas which that society constructs in the described collective interpretation of the world, (Berger & Luckmann, 1966). It follows that language is the best-suited platform for empirically analyzing a society and the relationships within it. Unfortunately, one of the ever-present relationships is that of hatred and negativity between members of a society, as is very evident these days in the manner in which many societies deal with immigration, refugees, and racial and economic divisions.

Discrimination is a relationship in which certain persons are treated less favorably than others on account of morally irrelevant considerations (OED, 2012). A discriminatory act, then, is the act of treating or considering a person differently based on class or category rather than on individual merit. It is, in other words, treating someone unfavorably due to certain unfounded beliefs, prejudices, and stereotypes. There are two major kinds of discriminatory behavior. One is termed *indirect discrimination*, and it occurs when someone acts in such a way that it causes offence and unfavorable treatment of a person but without this being intentional. This kind of discriminatory behavior is often the result of the traditional and unquestioning ways in which societies are ordered and the frame of mind present in the subconscious of the individual (synonymous in many ways with stereotyping). The other kind is called *direct discrimination* and it occurs when people engage in a discriminatory action with intention, the intended purpose of the act being to hurt and insult. For instance, in the case of many television commercials

advertising laundry detergents, it is observable how women are being discriminated against on the basis of their gender as they are mainly presented as homemakers cleaning up happily after their somewhat comically untidy husbands. It is obvious that this is a case of indirect discrimination, since such discriminatory acts do not stem out of the authors' desire to offend, but rather from the traditional (and morally faulty) background they undoubtedly have. In this example, the observed indirect discrimination is actually parallel with stereotypes and the prejudiced generalizations we make, such as, for example, the widely spread stereotypes of Germans being very punctual or Italians being always late. On the other hand, websites used by various extremist groups contain language full of racial insults and ethnic slurs, which is a clear example of racial insults and ethnic slurs they use is a clear example of offending with the intention to do so, which makes it a case of direct discrimination. In the end, discrimination understood as such, when applied to language norms, is the use of language by which a certain individual or a group of people are referred to or addressed in an unfavorable manner on the basis of their personal attributes (such as race, skin color, nationality, gender, and more).

This division between indirect and direct discrimination is important because even though direct discrimination has mostly been, in the last century at least, condemned and sanctioned by society, the appreciation of the negative aspects of indirect discrimination (and its very existence for that matter) has only come about in the last few decades. For example, in the 1960s people began to understand how certain expressions they have been using daily have additional marked meanings and how they may be understood as discriminatory, though without conscious intention (Hughes, 2009). One attempt to remedy the situation of rampant indirect discrimination, at least in linguistic terms, was the emergence of political correctness in the USA at this time.

The term *political correctness* was forged as a political notion initially, but it assumed other meanings during the ensuing decades. Eventually, it became a label for everything considered liberal, both in politics and in society: environmental conservation, feminism, peace movements, non-governmental organizations, and the anti-discrimination movement. In the end, the meaning crystallized into the one it holds today: non-discriminatory usage of language. It marked the emergence of a need in society to redefine certain values by redefining the language it uses to describe people. Apart from political correctness, another conceptual link could be made to paradigm of *microaggressions* (Sue et al., 2007; Sue, 2010). Sue defined

microaggressions as the everyday verbal, nonverbal, and environmental slights, snubs, or insults, whether intentional or unintentional (hence direct or indirect), which communicate hostile, derogatory, or negative messages to target persons based solely upon their marginalized group membership (2010, p. 5). His account serves to further reinforce the given psycho-social framework of discrimination as being both direct and indirect (as well as widespread and socially entrenched). In terms of attesting to the discriminatory use of language, the analysis will include both kinds of discrimination, focusing on its concrete linguistic instantiations.

If we really try to look deeper at where the disapproval of discrimination comes from in philosophical terms, we can start with a realization that modern society rests on several fundamental pillars such as economy, religion, law, and social norms. Social norms are among the most important ones because they actually sustain the structure of our civilization and maintain its contemporary form. Social conventions function as a binding tissue keeping human communities together because they provide rules that offer guidance in terms of social interaction. They also stand to protect civil rights as defined by a given society. Any breach of those social norms when directed towards individuals is seen as unacceptable, including discriminatory behavior. This is why these social norms were forged into laws very early on. Observed from a legal perspective then, discrimination is deemed not only socially but also, for the most part, also legally unacceptable. Investigating different legal frameworks out there, they all seem to be guided by the same principles of morality and fairness on the whole, upholding the ideal social norms and protecting the rights and dignity of all. Starting with the UK anti-discrimination law (Disability Discrimination Act 2005), which stands as one of the first legally ordered sets of documents covering human rights and relations in Europe, it is comprised of several statutes dealing with gender (The Sex Discrimination Act 1975), race (The Race Relation Act 1976) and disability (The Disability Discrimination Act 1995). Put together they represent a comprehensive set of rules dealing with discrimination on the basic grounds of gender and marital status, race, color, nationality, ethnic and national origin, and disability in the fields of employment, education, law, and the provision of goods and services. Such moral standings have generally been respected in societies across the globe for a long time, but in the 1970s the UK was one of the first to actually define violation of them as illegal and punishable by law. Another, also remarkable, achievement of the UK anti-discrimination laws is that they first provided valid definitions of what race, gender, disability, nationality and other notions stand for

in legal terms (Disability Discrimination Act 1995). Looking into the EU anti-discrimination law, since the draft of the Constitution of the EU has been signed, a significant push towards implementing EU-wide laws has been made, especially in the field of protection of fundamental human rights.

The signing of many treaties in the late 1990s and early 2000s (such as the Treaty of Amsterdam of 1997) led to a certain moment in 2006 when a document compiled of several different acts, charters, and directives and agreed upon over the last decade, all dealing with the protection of human rights, was published by the European Commission (and which has been revised since then). The document was dubbed the *EU Anti-discrimination Law* and though it draws heavily upon its UK predecessor, it adds some interesting new elements into the consideration of discrimination. The first difference, probably resulting from the fact that the basis of this law reflects similar laws present in all respective EU member countries, can be seen in the major types of discrimination this law is designed to cover, which are nationality and national and ethnic origin, gender and marital status, religious or political beliefs, disability, age, and sexual orientation. The second difference consists of the somewhat expanded definitions of nationality and ethnicity, most probably because of the specific structure of the EU itself.

Finally, the USA anti-discrimination law is one more important instance in regarding what is generally to be considered as discrimination. The federal laws prohibiting discrimination are comprised of several important legislative documents: Title VII of the Civil Rights Act of 1964, the Equal Pay Act of 1963 (EPA), the Age Discrimination in Employment Act of 1967 (ADEA), Title I and Title V of the Americans with Disabilities Act of 1990 (ADA), Sections 501 and 505 of the Rehabilitation Act of 1973, the Civil Rights Act of 1991, the Civil Service Reform Act of 1978 (CSRA), and, of course, the US Constitution. All put together they forbid discrimination within the USA on the basis of the following criteria: race, color, national origin, religion, gender, ethnic group, political beliefs, sexual orientation, disability, and age. Those laws, combined with certain individual state regulations, form the backbone of the anti-discriminatory apparatus on the federal level. Similar laws can be found worldwide and generally follow the same trends.

Hence, if we consider discrimination from the standpoints of social norms and the laws representing them and try to translate this into linguistic terms, we can reiterate the definition of discrimination as the use of language in such a way that a certain individual or a group of people

is treated in an unfavorable manner on the basis of a set of personal attributes. The different documents sanctioning discrimination just considered sum discrimination up within the following eight grounds (with brief definitions from the legal frameworks for the ambiguous ones):

- race and color: race (and color by extension) is generally outlined as not referring to scientific (biological or genetic) or anthropological notions, but rather taking into account social and cultural characteristics as well as ancestry;
- ethnic and national origins: *national origin* refers to the nation from which a person originates and relates to the specific legal relationship between the person and the state, while *ethnic origin* refers to less formal (legal) relationships relating to a person's background (ancestry, lineage) or personal (cultural) identity;
- religious and political beliefs: the reference here is very wide and marks the condemnation of discrimination based on any religion, religious belief, political standpoint, or philosophical belief. Political affiliation aside as given, looking at religion we must note that as there is no definitive list of internationally recognized religions, even religions not officially recognized in individual countries may still be recognized as a philosophical belief;
- gender: while *sex* may refer to the biological and physiological characteristics that define men and women, *gender* is generally recognized as referring to socially constructed roles, behaviors, activities, and attributes;
- sexual orientation;
- age;
- disability; and
- social status and appearance: *social status* signifies one's supposed position or rank within a society (based on different and often unclear criteria) while *appearance* refers to someone's perceived appearance in terms of criteria such as attractiveness.

It is the research goal of this study to propose and initially test the hypothesis that there is a strong positive correlation between levels of different kinds of discrimination in a given society and the linguistic use of corresponding discriminatory expressions in the same society. The

rationale is that if a particular concept is more present in one society and its collective consciousness, then it will be, by default, more referred to in communication and be more present in its discourse (Dobrić, 2015). To illustrate the argument, we can take an example of a society which has to deal with a lot of racial diversity, and hence has experienced a lot of racially motivated discrimination. It is expected, unfortunately, that the given society will have developed a sizeable derogatory vocabulary to express this commonly appearing issue and will be referring to it often in daily communication. On the other hand, a society which has not had extensive experience with racial diversity will not be referring to it as often as it does to other topics that are commonly occurring phenomena for them. Hence, derogatory vocabulary referring to race will not be extensively developed nor will it be as commonly employed in communication, meaning that in a more homogenous society there would be less discrimination directed at race. To demonstrate the methodological feasibility of this kind of a socio-linguistic study and offer a glimpse into its general plausibility, I will offer an proof of concept²² investigation (and comparison) of discrimination discourse (and the levels and types of discrimination it entails) in four South-European languages and societies including German, Romanian, Serbian, and Slovene.

Methodology

Having in mind the goal just posed, the data collection stage consisted of two tasks. One was to compile a representative lexicon of discriminatory expressions relating to any and all of the eight listed grounds of discrimination in each of these four languages. The second step was to find representative corpora of the languages involved to serve as the empirical platforms for assessing the frequency of each of the target discriminatory expressions, as well as to define the criteria of actually identifying the discriminatory expressions in the said corpora.

Discrimination discourse

As stated, the first task of the analysis was to put together a lexicon comprised of discriminatory expressions, relating to any and all of the eight derived bases of discrimination we put forward previously (namely race, color, nationality and ethnicity, religious and political beliefs, gender,

²² It is important to stress that the analysis offered is to serve as exemplifying the methodology only as there are serious issues with representativeness of both the lexicons used and the corpora investigated (as is elaborated in the final section of the paper), as well as the lack of a qualitatively grounded comparative study.

sexual orientation, age, disability, and social status and appearance). The investigatory part of the work revolved around a list of 400 discriminatory expressions (one hundred for each of the considered languages). The lists of offensive expressions were gathered mostly from media sources such as newspapers, TV shows, and general Internet sites, as well as various Internet publications by multiple racist and fascist organizations operating in the given countries. Any other more official sources are, unfortunately, nonexistent but the list compiled in this paper may serve as a starting point for constructing one in the future. Finally, the list consisted of nouns only, which best showcased the derogatory content available and also lent themselves well to practical corpus analysis.

Due to the nature of investigating corpora, we had to divide the procedure of searching for the given key words in terms of semantic transparency. On one side we had the semantically unambiguous lexical terms (in terms of their derogatory content), such as *Neger* (GER) / *negrotei* (RO) / *niger* (SER) / *črnuh* (SI)²³ (which all solely refer to a person of African or African-American descent in a very derogatory manner and have no other semantic content), that leave no other interpretation in terms of their discriminatory nature. In essence they present cases of very direct linguistic discrimination, can be attested directly in the relevant corpora, and all of their appearances can be safely counted towards the final discrimination count. On the other side, semantically ambiguous cases (again in terms of their derogatory uses), such as *Stute* (GER) / *pisica* (RO) / *cica* (SER) / *mačka* (SI) (where each of them can refer in their non-metaphorical prototypical meaning to a type of animal – namely *mare*, *cat*, *pussycat*, and *cat* respectively) required disambiguation when it came to their particular contextual use, since their discriminatory meaning was perhaps to be found in possible secondary metaphorical uses. In such cases there was a need to employ a metaphor identification technique generally following the standard Pragglejaz Metaphor Identification Procedure (MIP) (Steen, 1999; Pragglejaz Group, 2007; Steen, 2007; Steen et al., 2010; Dobrić & Weder, 2015). Hence, the analysis involved first reading the wider context housing the discovered KWICs²⁴ of the said lexemes (in themselves each a potential metaphor) to accurately establish their basic (prototypical) and immediate contextual readings. The meanings of the target lexemes and of the potential lexicalized metaphors have been weighted in terms of their contextual readings by comparing

²³ The shorthand marking the different source languages: *GER* for German, *RO* for Romanian, *SER* for Serbian, and *SI* for Slovenia.

²⁴ Key Word in Context.

them with the first listed general readings in the dictionaries relevant to each language, which was taken as a benchmark of basic prototypical meanings. Then the lexical units at hand were marked as metaphorical if their immediate readings related to their basic meanings through some form of a similarity relationship. Once disambiguated in this manner, only the metaphorical instances marking a discriminatory use of these polysemous lexemes were attested in a representative selection of relevant corpora.

The corpora

Once the lexicons have been compiled, I defined step two as selecting the appropriate and representative corpora (Dobrić, 2009) within which to assess the frequency of occurrence of each of the discriminatory expressions and, by hypothesized correlation, the prevalence of each of the possible bases for discrimination. The list of corpora selected for analysis is given below in alphabetical order:

- German: The *German Reference Corpus* (known also as *Deutsches Referenzkorpus* (DeReKo), *Mannheim corpora*, *IDS corpora*, or *COSMAS corpora*) is a 5 billion-word reference corpus of contemporary written German. It constitutes the world's largest linguistically motivated collection of electronic corpora and can be accessed via COSMAS II, access to which is free of charge. It contains belletristic, scientific and popular scientific texts, a large number of newspaper texts, as well as a wide range of additional text types. The corpus archive is continuously updated and expanded (Kupietz et al., 2010);
- Romanian: The *Romanian web as corpus* (RoWaC) is a 50 million-word corpus of contemporary Romanian sourced mostly from academic written works. It was gathered from the web and the texts within were further processed in order to remove the unwanted content, with the first version available through Sketch Engine in August 2009. A program of additions and improvements over a number of years is anticipated (Szabo, 2015);

- Serbian: The *SrpKorp Corpus of Contemporary Serbian Language* (*SrpKorp korpus savremenog srpskog jezika*) was started in 1981 during the Mathematical and Computer Linguistics (*Matematička i računarska lingvistika*) project. It was further developed by Duško Vitas, together with Cvetana Krstev and other associates from the Department for Language Technologies, Faculty of Mathematics at the University of Belgrade. The corpus today counts 113 million words from written sources and has been automatically POS tagged (Utvić, 2011; Popović, 2010); and
- Slovene: The *FIDA Plus* corpus is the most representative and balanced general corpus of Slovene. It is comprised of a wide array of possible sources (though the spoken language is still underrepresented) of relatively contemporary language ranging from 1990 to 2000. It currently stands at 621,150,000 entries all tagged following the MUTEKT – East tagging format (Dobrić, 2009).

The listed corpora have been chosen on the basis of two criteria: representativeness and availability. Representativeness as a criterion is extremely hard to achieve when it comes to corpora and refers to how well they represent the given language in its entirety. As is evident from the descriptions given above, and as it will be clarified further on when describing limitations of this study, most corpora out there (and especially those of languages other than English) lack somewhat in terms of representativeness. This means that the sources they derive from are not diverse enough, there is very little or no spoken language represented, or they are comparatively small for any real statistical validity. However, they are the best that can be found for investigating a particular language in any quantitative form. The second criterion governing our choice refers to this fact and basically translates into using corpora that are actually available for study.

With both the discriminatory lexicon and the selection of corpora in place, Table 1 presents the top five discriminatory lexemes, by language, for each of the eight discrimination categories attested within the corpora listed above (actual counts can be found in Appendix 1).

Table 1. The top five ranked discriminatory expressions in each category, by language

	GERMAN	ROMANIAN	SERBIAN	SLOVENE
race and color	Jud	colorat	crnac	cigan
	Neger	negricios	niger	murček

	Zigeuner	negrotei	ciga	črnc
	Kaffer	gorila	garavi	črnokožec
	Schlitzaug	țigan	crnja	črnuh
nationality and ethnicity	Araber	gabor	englez	švab
	Zigeuner	cioara	amer	čefur
	Ami	cioroi	balija	balkanec
	Piefke	jidan	vlah	nemškutar
	Kanak	vlah	šiptar	aziat
religion and politics	Nazi	clampau	separatista	domač
	Mullah	comunist	antihrist	satanist
	Faschist	rasist	poturica	izdajalec
	Gutmensch	bigot	cionista	fašist
	Sozi	habotnic	satanista	nevernik
gender	Sack	pisica	riba	jalovec
	Macho	fusta	kurva	koza
	Stute	blonda	cica	mačka
	Schnitte	curva	usedelica	kobila
	Hengst	puta	macan	kljuka
sexual orientation	Warmer	pervers	bolesnik	peder
	Homo	poponar	Manijak	lezbijka
	Schüttler	lesbi	Peder	perverznež
	Lesbe	bulangiu	Peško	manijak
	Schwuchtel	homalau	lezbejka	toplovodar
age	Tattergreis	senil	matori/a	baba
	Knirps	ramolit	matorac/ka	metuzalem
	Mädi	dinosaur	metuzalem	babura
	Halbstarker	sclerozat	dinosaur	dinozavri
	Pimpf	mucoasa	Baba	staruh
disability	Behinderter	idiot	budala	tepec
	Blinder	cretin	Idiot	tele
	Depp	degenerat	Ludak	idiot
	Trottell	paranoic	Kreten	kreten
	Krüppel	handicapat	Slepac	neumen
status and appearance	Kuh	porc	Smrad	konj
	Schwein	cur	majmun	gorjan
	Arsch	vagabond	magarac	kmet
	Sandler	drogat	narkoman	osel
	Pauker	vaca	prosjak	mrha

Distribution across categories: Example study

On account of the differing sizes of the corpora used, their rank order rather than their counts is used for the purposes of comparison. Figure 1 below shows the ranking of each of the eight discrimination categories for each of the attested languages. Each of the discrimination dimensions is, as explained, represented by five related expressions in each language. The value on the y-axis represents ranking from least to most prevalent use, thus the height of the bars correlates to the relative frequency within the corpus.

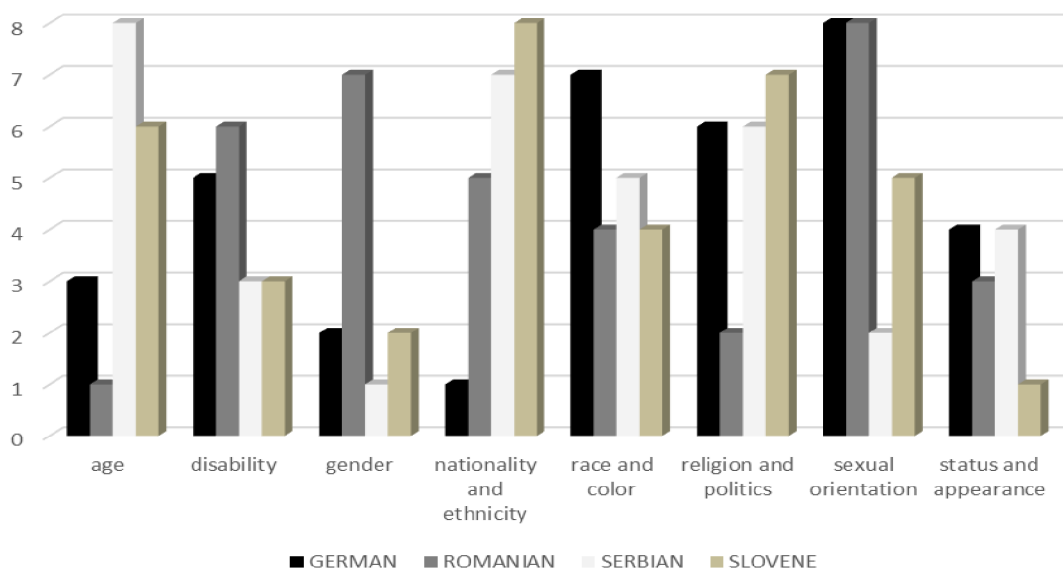


Figure 1. Ranking of the eight discriminatory areas across the four languages

If we look at the distribution of each of the areas of discrimination in the figure above, we can see that *age* seems to rank highest in Serbian, third-highest in Slovene, and then relatively low in German (second from last) and Romanian (the very last). If we follow our reasoning that the amount of linguistic discrimination reflects and positively correlates to the extent of discrimination present in a given society, we could say that in both Serbia and Slovenia people tend to discriminate a lot in terms of people's age, while not so in Romania and Germany. *Disability* comes as third highest in Romanian, fourth-highest in German, and then is in the lower half for Serbian and Slovene. *Gender* shows interesting distribution, coming as second highest in Romanian and then really low in all three other languages. *Nationality and ethnicity* is quite the opposite: it ranks extremely low in German (last ranked) and then relatively high in the

other languages – the highest ranked in Slovene, second highest in Serbian, and third highest in Romanian. *Race and color* is, unfortunately quite expectedly, ranked relatively high for all languages, being the second highest for German. *Religion and politics*, apart from Slovene, also ranks quite highly for the other three languages and societies. *Sexual orientation* is the area ranking the highest in average, being the top one for German and Romanian, third highest for Slovene, and then quite low for Serbian. *Status and appearance* ranks relatively low for all again, being in the bottom half ranks across the spectrum.

All of this would translate into a deduction that in Germany people mostly discriminate against other people on the basis of their sexual orientation and least on the basis of their nationality and ethnicity. In Romania they share this trend, while discriminating least on the basis of age. Serbians discriminate mostly based on someone's age and least based on someone's gender. Finally, in Slovenia they are least tolerant of people of different nationality and ethnicity and most open to people of differing status and appearance.

Discussion and limitations

If we accept as plausible and methodologically feasible the premise that discrimination in a given society is reflected in the amount of discriminatory expressions existing and being used in its discourse, what we can do after presenting the quantitative results is to try and postulate reasons as to why the distribution is as we have attested it. Seeing that any such analysis would entail qualitative insight into possible causes (including interviews, surveys, and similar methodology), the most we could do is to make educated guesses towards that end. To illustrate this aspect of what must be an integral part of any such complete analysis, we can focus on the discriminatory dimension of nationality and ethnicity. We could pose, for instance, that in the Serbian and Slovene societies high discrimination based on *nationality and ethnicity* is connected to the relatively recent political changes and civil wars, or more precisely, to the intolerance stemming from such unfortunate events. On the other hand, Germany could be demonstrating a rather low count due to the emancipation period it underwent in the last century after the issues brought about by the WWII and its problematic past. Similar argumentation could be made in the other cases we have seen above.

However, any such interpretation of these or any other results obtained using similar methodology must be aware of its limitations. They are two-fold and refer both to the source of

keywords used for investigation as well as to the corpora used as the basis of the investigation. The pivotal concept is once more representativeness – the lexicons must be representative of the discriminatory areas in question, and the corpus must be representative enough of the discourse (and society) being scrutinized. If we once more take one of the examples from above, we can, with quite a lot of certainty, propose that the area of *sexual orientation* owes its relatively low rank in Serbian due to the failures of corpus representativeness. Serbia has experienced numerous problems in terms of organizing pride parades and struggles as a society to accept alternative sexual orientations. The fact that the corpus of Serbian we investigated lacks any spoken dimension is the most likely reason that the expressions referring to this type of discrimination did not rank much higher or on par with the other languages. Additionally, even in cases where one can find representative corpora, annotation in terms of coding for metaphorizations of discriminatory behavior is, despite obvious importance, almost entirely lacking.

Ultimately, two major conclusions can be drawn from our study. One is that the hypothesis of positively correlating use of discriminatory linguistic expressions and the extent of discrimination in a particular society seems to be quite plausible and opens up an interesting methodology for conducting sociological and sociolinguistic studies. The extent of us naming a concept and the frequency of referring to it in communication are seemingly directly influenced by the degree of the relevance of the given concept in one discourse community, which can then be accessed following the logical route back. The second is that in order to assess the actual use of the linguistic expressions and the extent of discrimination we need corpora which are representative enough of the languages actually being spoken in the said community.

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Appendix

Table A1. Ranked raw corpus counts

	SERBIAN	SrpCorp+	GERMAN	COSMAS II	ROMANIAN	roWaC	SLOVENE	Fida Plus
race and	crnac	553	Jud	14559	colorat	1467	cigan	166
color	niger	106	Neger	7847	negricios	321	murček, muri	68
	ciga	87	Zigeuner	3334	negrotei	29	črnec	56
	garavi	55	Kaffer	786	gorila	6	črnokož ec	33
	crnja	32	Schlitzaug	1	țigan	1	črnuh	26
nationality	englez	576	Araber	15247	gabor	239	švab	41
and ethnicity	amer	72	Zigeuner	8359	cioara	114	čefur	28
	balija	55	Ami	5021	cioroi	67	balkanec	23
	vlah	42	Piefke	812	jidan	66	nemškut ar	13
	šiptar	14	Kanak	563	vlah	60	aziat	12
religion and	separatista	546	Nazi	8950	clompau	2928	domač	48
politics	antihrist	99	Mullah	2071	comunist	567	satanist	44
	poturica	36	Faschist	1078	rasist	80	izdajalec	40
	cionista	23	Gutmensch	1045	bigot	58	fašist	37
	satanista	16	Sozi	1003	habotnic	56	nevernik	28
gender	riba	2164	Sack	43689	pisica	498	jalovec	158
	kurva	194	Macho	9489	fusta	305	koza	147
	cica	85	Stute	7972	blonda	91	mačka	129
	usedelica	40	Schnitte	7892	curva	50	kobila	111
	macan	26	Hengst	7693	puta	32	kljuka	60
sexual	bolesnik	1392	Warmer	20995	pervers	484	peder	129
orientation	manijak	110	Homo	15064	poponar	47	lezbijka	48
	peder	75	Schüttler	8908	lesbi	4	perverz ež	26
	peško	34	Lesbe	633	bulangiu	2	manijak	22
	lezbejka	13	Schwuchtel	278	homalau	1	toplovod ar	19
age	matori/a	405	Tattergreis	6564	senil	132	baba	101

	matorac/ka	28	Knirps	4247	ramolit	65	metuzal em	81
	metuzalem	18	Mädi	599	dinozaur	37	babura	32
	dinosaurus	18	Halbstarker	293	sclerozat	34	dinozavr i	18
	baba	7	Pimpf	238	mucoasa	31	staruh	8
disability	budala	732	Behinderter	20393	idiot	1522	tepec	145
	idiot	294	Blinder	7085	cretin	529	tele	83
	ludak	246	Depp	6854	degenerat	178	idiot	48
	kreten	166	Trottet	2872	paranoic	138	kreten	45
	slepac	92	Krüppel	1834	handicapat	126	neumen	44
status and appearance	smrad	325	Kuh	30712	porc	1879	konj	271
	majmun	260	Schwein	19438	cur	488	gorjan	172
	magarac	241	Arsch	4701	vagabond	440	kmet	170
	narkoman	201	Sandler	4108	drogat	255	osel	110
	prosjak	160	Pauker	1559	vaca	216	mrha	101

Cultural Representation of English Translation of Cultural Specific Items (CSIs) in Two Persian Books

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Abstract

The present research was conducted in order to find out if the source language was represented or misrepresented through the translation process. For this purpose, two award-winning contemporary Persian novels which had been translated into the English language were selected as the corpus of the study: "Things We Left Unsaid" by Zoya Pirzad, translated by Franklin Lewis (2012), and "Symphony of the Dead" by Abbas Maroufi, translated by Lotfali Khonji (2007). Also, the theoretical framework applied in this study was Aixela's categorization of culture-specific items (1996) which includes "common expressions" and "proper nouns". The frequency and percentage of each strategy applied for translating CSIs were calculated. As the statistics demonstrated, CSIs were translated mostly through Absolute Universalization and Linguistic (non-cultural) Translation which belonged to Substitution and Conservation groups, respectively. Naturalization was another most frequent strategy which belonged to Substitution as well as the Orthographic adaptation which belonged to Conservation. According to the results, it could be inferred that English translations of Persian CSIs, neither represent nor misrepresent the source culture because strategies of both groups were used almost equally.

Keywords

Translation, Culture Specific Items, Proper Nouns, Common Expressions, Translation Strategies, Source and Target texts

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According to Catford's definition (1965) translation is defined as “a procedure of transferring a written text from SL to TL, conducted by a translator, or translators, in a specific socio-cultural context” (Hatim & Munday, 2004, p.6). According to such definition, it seems that translation is more a linguistically oriented kind of profession; however, translation is more than the mere replacement of material from one language into another language. It was in 1990 that Bassnet and Lefevre coined, for the first time, the term "cultural turn" to refer to the fact that translation should not be regarded as a linguistically- oriented phenomenon; rather it must be looked upon in accordance with culturally-loaded theories of translation which can provide a deeper outlook in the domain of translation. They thus assumed that:

The growth of Translation Studies as a separate discipline is a success of story of the 1980s. This subject has been developed in many parts of the world...Translation Studies brings together work in a wide verity of fields, including Linguistics, Literary Studies, history, anthropology, psychology, and economics. (Lefevere, 1992, p. vii)

The literature of each specific culture functions as a representative when it is translated and travels to other cultures. Since culture (in general) and translating culturally specific features in literary systems (in specific) are of paramount importance in every society and can affect everyday life (Bahameed, 2013), many scholars have made efforts to systematically define the notion of culture in their own words. For example, some believe that

Translation involves far more than the replacement of lexical and grammatical items between languages...once the translator moves away from close linguistic equivalence, the problem of determining the exact nature of the level of equivalence aimed for beginning to emerge. (Bassnett, 2002, p. 34)

It is obvious that translation is not limited to the knowledge of a language, but a comprehensive knowledge of the culture of that language. In other words, one cannot claim to have translation competence just because he knows two languages; thus, translation skills require more than knowing two systems; meaning that:

Apart from an excellent knowledge of both the source and the target language, which comprises vocabulary and word formation, grammar, spelling, and pronunciation, the translator also has to possess so-called socio-linguistic competence which helps him to understand the text within its context, to determine its functions and predict who is going to receive it. (Paluszliewicz- Misiaczek, 2005, p. 243).

Considering the fact that culturally specific items can be very important and interesting phenomena and due to the fact that there is a lack of research in an English translation of Persian novels in terms of cultural specific items, the main objective of this research was to investigate the translation of these items from Persian into English.

Review of the Related Literature

In order to reach an understanding of the important issues addressed in this study, it seems necessary to have a review of theories and empirical studies on this matter. Many scholars have made efforts to offer comprehensive definitions of translation. However, translation can be seen from different perspectives. In its simplest definition, “Translation is a craft consisting in the attempt to replace a written message and/or statement in one language by the same message and/or statement in another language” (Newmark, 1981, p.7). In another definition, Bell (1991) defines translation as “the expression in another language of what has been expressed in another language, preserving semantic and stylistic differences” (p. 5). Although this definition seems to be a better definition, still it lacks a comprehensive and unified cohesion which can cover all aspects of translation. In other words, such simplistic definition of translation cannot be regarded as a comprehensive definition and other scholars have approached translation from other perspectives.

As a Russian-based linguist, Jakobson (as cited in Munday, 2001) categorizes translation into three main groups; namely as

- Intralingual translation, or 'rewording': an interpretation of verbal signs by means of other signs of the same language;
- Interlingual translation, or 'translation proper': an interpretation of verbal signs by means of some other language;

- Intersemiotic translation, or 'transmutation': an interpretation of verbal signs by means of signs of nonverbal sign systems (Munday, 2001, p. 5).

As can be seen, Jakobson (*ibid*) has approached translation from linguistically- oriented perspectives and believes that everything which is expressed in one language can also be expressed in another language and it is only poetry which requires some creativity. One of the first theories of translation and translation equivalence in the twentieth century was the one which was offered by Nida. He who used to work as a Bible text translator divides translation into two dichotomies as formal equivalence vs. dynamic equivalence (Munday, 2001). For him, formal equivalence is the one which requires resemblance to source text in terms of style, content, and form; while dynamic equivalence is oriented to the needs of the target language in terms of content and form.

Although the dichotomy of formal equivalence vs. dynamic equivalence was very popular on its time, some other scholars offered different definitions of translation, one of which is the translation theory which was offered by Newmark. In other words, Newmark divides translation into two different parts as semantic translation and communicative translation. For him, communicative translation is the one which tries to make an effect on the recipients that is as natural as possible to that one which is expressed in original readers; while semantic translation is the one which attempts to change, as much as possible, the structures of the target language towards the structures of source language. It is clear that although many different definitions of translation have so far been offered by different scholars, one cannot look for one unified and comprehensive definition of translation which can be suitable for every context.

According to Torop (2002), translation is a kind of activity which is the result of communication between two languages and thus is inseparable from the concept of culture. The translational capacity of culture is an important criterion of culture's specificity. Culture operates largely through translational activity, since only by the inclusion of new texts into the culture can the culture undergo innovation as well as perceive its specificity.

The act of translation involves not only transferring meaning from one language to another, but involves transferring culture from source to target in a sense that it does not distort the source culture. Translation acts as bridge between heterogeneous cultures and is not only a verbal transfer but also contains transferring elements of that culture. Toury (2000) defines

translation as “a kind of activity which inevitably involves at least two languages and two cultural traditions” (p. 200). This definition inevitably requires that translation exceeds more than mere replacement of changing meaning from one language into another language; therefore one must take culture into account. Toury furthermore requires that translation is totally a culturally-oriented activity and does not take into account the linguistic parameters. For him:

Translation activities should be regarded as having cultural significance. Consequently, 'translatorship' amounts first and foremost to be able to play a social role, i.e. to fulfill a function allotted by a community — to the activity, its practitioners, and /or their products — in a way which is deemed appropriate in its own terms of reference. The acquisition of a set of norms for determining the suitability of that kind of behavior and for maneuvering between all the factors which may constrain it is, therefore, a prerequisite for becoming a translator within a cultural environment. (Toury, 1978, p. 83)

The Cultural Turn is another major change which drew the attention of translation from linguistically- oriented theories towards more cultural directions. The proponents of this orientation believe that translation should be viewed from cultural perspectives and that translation is not just a mere replacement of words from one language into another language; thus:

Translation has to do with authority and legitimacy and, ultimately, with power, which is precisely why it has been and continues to be the subject of so many acrimonious debates. Translation is not just a “window opened on another world,” or some such pious platitude. Rather, translation is a channel opened, often not without a certain reluctance, through which foreign influences can penetrate the native culture, challenge it, and even contribute to subverting it. (Bassnett & Lefevere, 1990, p. 2)

Larson defines culture as "a complex of beliefs, attitudes, values, and rules which a group of people shares" (Larson, 1984, p. 431). In this regard, the translator should know the cultural system of both languages, so he may transfer the culturally specific items from the source into target text. However, this is not the only definition of culture; there are some other

more complex definitions of culture which look at it from other perspectives, among which is the definition which approaches culture from anthropological perspectives and believes that

The anthropological concept of culture refers to the overall way of life of a community or society, i.e. all those traditional, explicit and implicit designs for living which acts as potential guides for the behavior of members of the culture. (House, 2002, p. 93)

Davis (2003) considers culture a unified set of rituals, demeanors, and values which are shared by a group of people and is passed through learning and education. In this view culture is a notion that must have the feature of being accepted by a group of people and furthermore must be passed from one to another through education and learning. Newmark is another scholar who looks at culture from another perspective (2010). He believes that culture does not have a specified and already established concept or definition and this is due to the fact that many people are intermingled in different ways in a way that:

[G]iven that this is increasingly an age of involuntary and voluntary migrations, of asylum and tax-haven seekers, - what a contrast! – of transnational companies, international organizations and worldwide N.G.O s, or of refugees and tourists, this concept of culture becomes increasingly blurred and slippery and fuzzy. (Newmark, 2010, P. 173)

What Newmark (2010) postulates about culture is based on an anthropological definition. He believes that culture and language are inseparable from each other and have to be examined in a common ground which means that meaning "the way of life and environment peculiar to the native inhabitants of a particular geographical area, restricted by its language boundaries" (p. 173). In line with Newmark's definition of culture, House defines culture in an anthropological perspective. In other words:

The anthropological concept of culture refers to the overall way of life of a community or society, i.e. all those traditional, explicit and implicit designs for living which acts as potential guides for the behavior of members of the culture (House, 2002, p. 93).

Translating culture-specific items has always been an arduous kind of activity which requires too much time and effort. In other words, to understand all the implications in a literary text it is essential to know its culture. Culture-specific items are those words, sentences or phrases which are specified in the cultural contexts. However, to define culture-specific items, it can be said that:

Those textually actualized items whose function and connotations in a source text involve a translation problem in their transfer to a target text, whenever this problem is a product of nonexistence of the referred item or of its different intertextual status in cultural system of the reader of target text (Aixela, 1996, p. 58).

There are numerous classifications of CSIs, however, most authors identify CSIs with items such as local institutions, streets, historical figures, place names (toponym), personal names (anthroponymy), periodicals, works of art etc. (Aixela, 1996). Baker (1992) believes that CSIs items may be "abstract or concrete, it may relate to a religious belief, a social custom, or even a type of food, which is called culture-specific items" (p. 21).

Translating Cultural Specific Items

Brasiene (2013) considers that translating cultural specific items is a very arduous and sophisticated task and thus these elements can be analyzed from different approaches. One very popular model for analyzing CSIs is the model proposed by Venuti. Inspiring from Schleiermacher (Munday, 2001) the dichotomy proposed by Venuti (1995) is one of the approaches by which one can look at translation. Venuti divides translation methodology into two main classifications as domestication and foreignization. In Venuti's words (1995), domestication is defined as

[T]he domination of "Anglo-Americans translation culture. It involves 'an ethnocentric reduction of the foreign text to Anglo-American cultural values'. This entails translating in a transparent, fluent, 'invisible' style in order to minimize the foreignness of the target text. (p. 469)

What domestication requires is that the cultural elements of the source text be transferred in accordance to target language's culture in a sense that one may not easily distinguish it from source language text. However, the other classification is that of foreignization. For Venuti, foreignization "entails choosing a foreign text developing a translation method along lines which are excluded by dominant cultural values in the target language" (Venuti, 1997, p. 242). What foreignization requires, contrary to domestication, is that the translator may have to transfer the source language's cultural elements in such a way that the reader might understand that he is reading a translation. Although different scholars have shed lights on the pros and cons of this dichotomy, Venuti himself advocate for foreignization (Munday, 2001).

Cultural Specific Items can be analyzed from different perspectives. As an example, Leskovar (2003) conducted a comparative study on the translation of American prose into Slovenian literature. To this end, he analyzed some American novels which had been translated into Slovenian language. In analyzing these books, Leskovar found that most books had been domesticated through extra-textual gloss techniques such as adding some introductory sections.

Also, Paluszkieicz-Misiaczek (2005) did a research on strategies and methods in dealing with CSIs Polish-English translations of certain administrative and institutional terms. What he found in this study was that generalization, using a more specific word (homonym) and using cultural substitution of words were among the most used strategies in dealing with CSIs.

CSIs translation has been the subject of inquiry in modern translation studies and a number of studies have been conducted in this area of inquiry. In this regard, Shokri and Ketabi (2015) conducted research on the English translation of a Persian (Farsi) novel. Their study was seeking domestication and foreignization items. Their findings pointed that the book had been translated by applying domestication strategy. The results also could show that within domestication strategies, synonym was the most frequently used in the translation process.

Farahani and Mokhtari (2016) embarked on a case study on the CSIs translation in the English translation of a Persian (Farsi) novel. This study was conducted to see if CSIs are translated according to the domesticated or foreignization dichotomy. The findings of their study revealed the fact that the CSIs were translated in a way that the target text was more like a domesticated translation.

In line with the above studies, Amininadji (2016) did a study on CSIs translation of a Persian play into English. In this study, she was to see how CSIs were translated and which strategies were used by the translator. Her corpus of the study was limited to a very well-known Persian play and its English translation. In this study, she used Newmark's classification of CSIs. The results of her study demonstrated that cultural equivalent was the dominant strategy in translating CSIs followed by transference and functional equivalent.

Moreover, Bagheridoust and Mahabadi Mahabad (2017) investigated translation of culture-specific items in a case study of Persian architecture terminology. In this source text-oriented research, they were to analyze the texts to see how the translators were successful in rendering or preserving the CSIs. Their theoretical framework was Van Doorslaer's model and their corpus of the study consisted of two Persian books written in the field of architecture. The results of the study showed that the translators were successful at finding the appropriate equivalents in translation and that direct translation and word for word translation were the most used strategies.

The reviewed literature showed that although cultural items have been investigated by various scholars; however, the investigation of these items in a Persian- English context in the field of literature is an ignored area of inquiry which deserves more research.

Research Questions

Based on the above-mentioned issues and in line with the purpose of this study, the current research study was an attempt to address the following questions:

1. Do English translations of CSIs in the selected novels represent Persian local culture?
2. Are the most frequent procedures in accordance with this purpose?

Methodology

The design of the current study was descriptive, non-experimental and qualitative in nature so as to analyze the CSIs in two Persian books and their English translations. This research looked CSIs of two Persian novels which were translated into the English language. The model proposed by Aixela (1996) was used as the theoretical framework both in identifying CSIs and in

their translation procedure. The model proposed by Javier Franco Aixela has three phases. Aixela (1996) defines CSIs as follows:

Those textually actualized items whose function and connotations in a source text involve a translation problem in their transference to a target text, whenever this problem is a product of the nonexistence of the referred item or of its different intertextual status in the cultural system of the readers of the target text. (p. 58).

Aixela divides CSIs into two main categories as proper nouns and common expressions (ibid). To him, proper nouns prefer to use pre-established norms of the translation. By contrast, common expressions, mean those objects, institutions, habits, and opinions restricted to each culture that cannot be included in the field of proper names. She proposes a number of techniques by which the translator can deal with CSIs.

Repetition: the translator keeps the original CSIs in the target language.

Orthographic adaptation: it includes such strategies as transcription and transliteration and is used in cases where the original reference is said in a different alphabet from that of the original.

Extratextual Gloss: the translator uses some footnotes and/ or endnotes to make the text clearer.

Intratextual Gloss: the same as the extra-textual gloss, but the translator uses extra information as part of the text.

Synonymy: the translator explores a kind of synonym or parallel reference (s) so as to avoid repeating the CSI in the target language.

Limited universalization: when the CSIs are too nebulous for the readers in the target language thus, the translator uses another reference which belongs to source language context.

Absolute universalization: when the translator deletes nebulous connotations and chooses a reference which is more or less neutral for their readers.

Naturalization: when the translators change the CSIs of the source text in a way that it is felt by the target language readers as a specific reference to their language.

Deletion: when the translator comes to the idea that the CSIs of the source text cannot be accepted, for a variety of reasons, in the target language.

Autonomous creation: when the translator tries to coin new expressions close to its readers in the target language.

Corpus of the Study

In this research, two of the bestselling novels of contemporary Persian literature and their English translations were selected. Both of them are famous and popular besides their awards. The two novels are considered as the best works of their authors. The first book was *Things we left unsaid* translated into English by Franklin Lewis (2012) published May 3rd, 2012 by One World Publications. This multi-award winning novel set in southern Iran follows an Iranian-Armenian housewife's struggles to find fulfillment within her family's expectations. Zoya Pirzad is a renowned Iranian-Armenian writer and novelist. She has written two novels and three collections of short stories, all of which have enjoyed international success. Her most recent collection of stories, *The Bitter Taste of Persimmon*, won the prize for Best Foreign Book of 2009 in France. The second book was *Symphony of the Dead*, which was greeted with widespread praise when it was first published in Iran in 1989. This book was first written by Abbas Maroufi.

Table 1. Information on the Corpora

Title of the Book	Author	Translator
Things We Left Unsaid	Zoya Pirzad	Franklin Lewis
Symphony of the Dead	Abbas Maroufi	Lotfali Khonji

Size of the Corpora and level of Analysis

The corpora of this study included two Persian novels each of which had 215 pages more or less together with their English translations. The works in company with their English translations compile remarkable corpora to analyze translation process of culture-specific items. It is worth mentioning that this study covered the entirety of both books and did not restrict itself to portions

of them. In addition, it must be said that the analysis was at word and phrase and sentence levels to cover as many CSIs as possible.

Procedure

This research was conducted through several steps. At the first step, by applying Aixela's model (1996) for identifying CSIs, data was extracted from the two Persian novels. The extracted CSIs from the original novels, alongside their English translations, were entered in separate tables according to their cultural categories defined by Aixela. These cultural items were categorized according to Aixela's categorization of CSIs. At the second step, the English equivalents of CSIs were extracted from their English translated versions of the novels. At the third step, the procedures applied for translating CSIs of the two novels were identified according to the strategies proposed by Aixela.

Data Analysis

The total number of the extracted CSIs from 215 pages of Pirzad's novel is 314 those of Maroufi's novel from 215 pages is 308; and the total number of CSIs is 622. Following Aixela's categorization of CSIs, the extracted data were divided into two categories, namely as Proper Nouns and Common Expressions. Persian CSIs and their English translations were inserted in tables.

Table 2. Number of CSIs Items in Two Books

Common	436
Expressions	
Proper	186
Nouns	

Table 2 represents the number of CSIs in two books. As can be seen, common expression items are 436; while proper nouns are 186 only and the number on aggregation is 622 CSIs.

Table 3. Frequency and Percentage of Strategies for Translating Common Expressions

Strategy	Frequency	Percentage
Repetition	0	0%
Orthographic	6	2%
Adaptation		
Linguistic	85	19%
Translation		
Extratextual Gloss	0	0%
Intratextual Gloss	9	2%
Synonymy	2	0%
Limited	35	8%
universalization		
Absolute	191	44%
universalization		
Naturalization	92	21%
Deletion	11	3%
Autonomous	3	1%
creation		
Compensation	2	0%
Dislocation	0	0%
Attenuation	0	0%

Table 3. demonstrates the number and the frequency of the strategies applied in translating common expressions in two books. As can be inferred from the data, Absolute universalization, Naturalization, and Linguistic Translation were the most applied strategies used in translating CSIs with 44%, 21%, and 19%, respectively. Also, the data show that repetition, dislocation, and attenuation with all 0% were the least used strategies, followed by Autonomous creation with 1% and Intratextual Gloss with 2% only.

Table 4. Examples of Strategies Used for Translating Common Expressions

English Sentence	Persian Sentence	Strategy
Things we left unsaid	چراغ ها را من خاموش می کنم	Autonomous creation
The girl	دخترک	Absolute universalization
Came to my defense	بهداد مر سید	Linguistic(non-cultural) translation
I hemmed and hawed	منو من کردم	Naturalization
Dump, scattered	ولو	Synonymy
Senior grade	سینیور	Intratextual Gloss
My love	عزیزم	Limited universalization
Hmm	هوم	Orthographic adaptation
-----	خیالت تخت	Deletion

Table 5. The Frequency and Percentage of Applied Strategies for Translating Proper Nouns

Strategy	Frequency	Percentage
Repetition	0	0%
Orthographic Adaptation	44	24%
Linguistic Translation	37	20%
Extratextual Gloss	1	0%
Intratextual Gloss	7	4%
Synonymy	2	1%
Limited	7	4%

universalization		
Absolute	51	27%
universalization		
Naturalization	28	15%
Deletion	3	2%
Autonomous	2	1%
creation		
Compensation	4	2%
Dislocation	0	0%
Attenuation	0	0%

Table 5 demonstrates the frequency and percentage of applied strategies for translating proper nouns. As can be seen, while the Absolute universalization with 27%, Orthographic Adaptation with 24% and Linguistic Translation with 20% constitute the main portion of used strategies, respectively, dislocation and attenuation with 0% and Autonomous creation with 1% are the least applied strategies in dealing with CSIs.

Table 6.Examples of Strategies Used for Translating Proper Nouns

English Sentence	Persian Sentence	Strategy
School uniforms	روپوش	Absolute universalization
G-4	جی 4	Orthographic adaptation
Persian Calligraphy	خط نستعلیق	Linguistic (non-cultural) translation
Coffee table	میز جلوی راحتی	Naturalization
The Armenian Revolutionary	حزب دشناسکسیون	Intratextual Gloss
Peanuts	نخودچیکشمش	Limited universalization

-----	تخمشربتی	Deletion
-----	قنادینگرو	Compensation
Cart	گاری	Synonymy
Almond cookies	شیرینی عسلی	
		<i>Compensation</i>
Orange shift dress	لباسکیسپه اینارنجی	Autonomous creation
Persian carpet	قالیچه	Intratextual Gloss

Results

Response to the Second Research Question

The first research question of the current study sought to see if English translations of CSIs in the selected novels represented Persian local culture or not. A quick look at the data gained from tables 3 and 4 show that that cultural representation is not something that could be fulfilled exactly in translation because CSIs are items that are translated differently through opposite strategies in different contexts. Thus, it can be concluded that it is unlikely that the CSIs can represent source text culture in the translation process. The finding of the current study is in line with Vahedi's study (2012). He studied translating CSIs in terms of domestication and foreignization strategies. His study showed that translator had used both techniques, while domestication strategy was the main one; thus, CSIs had not been fully observed in the translation process.

Response to the Second Research Question

The second research question of this study was to see if the most frequent procedure/procedures were in accordance with this purpose of representing the local culture or not. According to statistics, it can be concluded that translators' orientations for translating CSIs were neither exactly toward representing source culture nor target culture and there was some degree of fluctuation in their approaches to applying strategies. In order to completely represent source culture through translation, the translators may move towards applying conservative strategies more than substitutive ones. However, findings of this research showed that the most frequent

strategies were not in accordance with the purpose of representing the source culture due to the fact that they belonged almost equally to substitutive strategies and conservative strategies.

Discussion and Conclusion

Translating culture specific items is one of the most challenging concerns of the translators. For translating such items, the translator must be familiar with the target culture and the source language (Munday, 2012). Indeed, it is obvious that translation is not limited to the knowledge of a particular language but a comprehensive knowledge of the culture of that language (Rezaei, M., & Kuhi, 2014). As Aixela (1996) puts it, CSIs are not the items, words or expressions that are held by them; rather, they are the fruit of intercultural interaction and transferring source texts items into target text. As a matter of fact, translating CSIs has been a controversial topic of research in translation. Since culture and language are very interrelated to each other (Mahadi & Jafari, 2012), one has to be very attentive towards this phenomenon. This complicated kind of job can be mainly due to the fact that

Translating culture-specific concepts seem to be one of the most challenging tasks to be performed by a translator; in other words, culture and intercultural awareness, are far more complex phenomena than it may seem to the translator. The more a translator is aware of complexities of differences between cultures, the better a translators/he will be. (Braçaj, 2015, p. 475).

This study was set to analyze two well-known Persian translations together with their English versions. In other words, the question concerning this study was on the English translation of Persian CSIs which were extracted from two award-winning contemporary novels. The researcher concerned whether the most frequent applied strategies for translating Persian CSIs had the conservative orientation so that they could represent Persian culture or not.

According to the results of the present study, Absolute Universalization was the most frequent strategy for translating common expressions and proper nouns which belongs to the Substitutive group. As statistics showed, two categories of CSIs, common expressions and proper nouns, were translated almost similarly, but there were some differences. In other words,

although Absolute Universalization was the most frequent strategy of both, Orthographic adaptation and linguistic translation were second and third applied strategies for translating proper nouns, for common expression it was not exactly the same. Common expressions were translated mostly through Absolute Universalization, naturalization, and Linguistic Translation.

You are using caps sometimes and others not for these terms. Esp paragraph above.

Other strategies for both categories of CSIs had almost similar percentages which were either 0% or under 5%. Accordingly, we can conclude that cultural representation is not something that could be fulfilled exactly in translation because CSIs are such items which are translated differently into opposite strategies. For example, when translator faces with a proper noun, he/she finds it more challenging than common expressions. As Aixela (1996) states, common expressions (as opposed to proper nouns) are much more liable to substitution strategies, i.e. to cultural domestication. In this connection, it seems useful to pay attention to what could be described as a sliding of translation strategies towards the cultural manipulation pole, where we can perceive a clear shift of the dominant strategy, which was Absolute universalization and Orthographic adaptation in the case of proper nouns, and turns into Absolute Universalization and Naturalization in common expressions.

According to statistics of this research, we can conclude that translators' orientation for translating CSIs was neither exactly toward representing source culture nor target culture and there are some fluctuations in their approaches for applying strategies. Some suggested implications that can be discussed in this study are as follows: although proper names had a greater share of using conservative strategies, they had a big share of absolute universalization too. For translating proper names, translators should take into account the lexical relations between hyponyms and hypernyms, which is a semantic relationship between specific and general lexical items. For the case of proper nouns, according to Harvey and Higgins (2002)

in translating a name, there are in principle, at least two alternatives. Either the name can be taken over unchanged from source text to target text, or it can be adapted to conform to the phonics/graphic conventions of the target language, and involves no cultural transposition (p.22).

It is a form of exoticism. It may be impracticable if it creates problems of pronounceability. In case of the second alternative, transliteration, Harvey, and Higgins state that it is less extreme conversion. Similarly, the same case exists in this corpus; translators prefer to transliterate proper nouns through the strategy of Orthographic Adaptation so that they could decrease pronunciation problems of their target audience. Furthermore, the findings showed that although CSIs essentially belonged to the same area- which is culture- they have not been translated exactly through the same strategies and different strategies have been used in different situations. Thus, it can be recommended that translator, with regard to the context of the situation, choose the proper strategy.

The last, but by no means, the least implication and suggestion is that the matter of being native or non-native does not have any impact on translation. In other words, the translator of Pirzad's novel was a Native American and a professor of Persian literature; while the translator of Maroufi's novel was a Native Persian. However, both translators took similar approaches for translating CSIs; thus it can be inferred that being a native speaker of one language, although a good asset, does not necessarily mean that the native speaker translator can have a better a translation.

Like any other study, the current study was subjected to some limitations which could, to some extent, have impact on the generalizability of the findings. First and most, the books were translated based on the order of the publishers; the translators had no influence on the publishers' idiosyncrasies or norms of the translation; nor had the researchers any impact over the idiosyncrasies of the translators. Furthermore, since analyzing each book was an arduous and time-consuming activity, the present study was limited to two well-known books. This also could constrain the generalizability of the results. Moreover, there are some other theoretical frameworks for analyzing CSIs in translation. However, the theory of the present study was not tested in terms of validity and reliability.

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