International Journal of Sociology and Anthropology Research
Vol.8, No.3 pp.32-40, 2022
Print ISSN: ISSN 2059-1209
Online ISSN: ISSN 2059-1217

Morphosyntactic complexity in Japanese advertising slogans

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Citation: Wenchao Li (2022) Morphosyntactic complexity in Japanese advertising slogans, *International Journal of Sociology and Anthropology Research*, Vol.8, No.3 pp.32-40

ABSTRACT: *This study applies mathematical linguistics to explore the morphological richness and syntactic freedom of Japanese advertising slogans and identify associations between the morphosyntactic features and the popularity of slogans. The data were drawn from the Tokyo Copywriters Yearbook, which includes 12 genres of advertising slogans. Mean dependency distance (MDD) and entropy (ENTR) were employed to measure syntactic diversity, and moving-average morphological richness (MAMR), moving-average mean size of paradigm (MAMSP), and mean word length (MWL) to measure lexical diversity. The findings indicate that in terms of syntactic complexity, slogans of the imperative form were the simplest and slogans of the volitional form were the most complex. In information amount, exclamatory slogans had the highest and volitional slogans the lowest. Spearman's rank correlation test for MMR, MAMSP, MWL, MDD, and ENTR showed that MAMR and MDD reflect the proposed 'complexity trade-off hypotheses'. Furthermore, the analysis of the Tokyo Copywriters Club (TCC)-Prize-winning slogans from 2018 to 2021 reveals a tendency towards popularity among the Japanese in the past four years, such that the simpler the slogans, the better. We hope that this research will aid copywriters in producing effective advertising slogans.*

KEYWORDS: Japanese, advertising slogan, lexical diversity, syntactic complexity, morphological richness

INTRODUCTION

Advertising has long served as an economic engine, promoting competition, driving innovation in business and providing benefits to society by attracting funds and attention. In Japan, advertising is of two types: commercial (CM) and *kyacchikopii* 'catch copy' (slogan or sales copy). Catch copy is a Japanese-coined English word, deriving from verb phrase *catch* copywriting, where *catch* refers to 'catch attention'. A CM advertisement focuses on listening, and a slogan focuses on seeing (Jantima 1998). A good deal of research has been devoted to advertising slogans in a variety of fields, such as pragmatics (context), syntax (particularly regarding case particles), semantics (rhetoric), and lexicon (Gotoo 2000; Arai 2006, 2007; Lv 2014, 2016; Sui 2021). In particular, slogans have been examined from a syntactic point of view, given that the Japanese language is fond of the 'middle construction'

(known as an *iisashi* expression), which is an incomplete sentence ending with a conjunction or a particle, as exemplified by (1) and (2).

(1) Ikitaidesuga.
go-want-predicate-conjunction
'I should like to go, but…'

(2) Mirai e.
Future to
'to the future.'

It has been discovered that the efficiency of advertising slogans is linked to four issues: (a) writing script; slogans written in katakana appear to be more effective than in hiragana (e.g. 止まれ *tomare* 'stop' →トマレ); (b) phonologically, special Japanese sounds (contracted sounds, prolonged sounds, geminate consonants), mimetics, and onomatopoeias (cf. Yang and Yang 2013, Ruan 2015) may improve a slogan's efficiency; (c) syntactically, slogans that end with a case particle appear to be more subjective, shortening the distance between advertisers and consumers, which in turn enhances the advertisement's efficiency. The Japanese language has nine case particles, each playing different pragmatic roles in advertising slogans; for example, *e* 'towards' is likely to imply a trend, the accusative case particle *o* tends to indicate a hope, the dative case particle *ni* renders a result, and so on (Shao 2015). Furthermore, free word order plays a part. Japanese is basically subject-object-verb ordered. It also allows up to six encoding strategies so long as the verb remains sentence-final and case particles are moved together with the semantic roles: に N を, を N に, が N を, を N が, が N に, and に N が. An advertising slogan is a summary of what it stands for, such as specialty, position, and commitment. Human memory has limitations. Eye-catching, impressive advertising slogans tend to be short, concise, and sometimes in a reversed word order. This study aims to examine the information amount that advertising slogans of different sentence types carry using the concept of information entropy. Second, will the efficiency of slogans be associated with word length, syntactic complexity, or morphological richness? Accordingly, this study explores the following two matters:

(a) the information that an advertisement slogan carries (measured by entropy), its syntactic complexity (measured by dependency direction and dependency distance), and its lexical sophistication (measured by mean word length and morphological richness); and
(b) the link between the above features of advertising slogans and slogans' popularity.

In this article, Section 2 outlines the methodology (including the corpora, metrics and calculation), Section 3 addresses results and discussions, and Section 4 presents the conclusion.

DATA AND METHODS

Data

The data were drawn from the Tokyo Copy Yearbook, produced by the Tokyo Copywriters Club (TCC). TCC is a nationwide association of copywriters and commercial message planners, founded in 1958, and its yearbook is published annually. This study collected 1,000 copies from 2018 to 2021, which included 12 genres of slogans: fashion, food, education, business, medical health, industry, university fairs, entertainment, literary award, recruitment, arts, and tourism promotion.

Procedure

The syntactic complexity and lexical diversity of 12 types of advertising slogans were analysed to examine their morphosyntactic feature and the connections to their popularity. The following procedures were conducted:

Step 1: Draw raw data from the TCC Yearbook and build a database

Step 2: Category the slogans into five groups based on sentence types: declarative, imperative, exclamatory and interrogative manually

Step 3: Analyse slogan from a lexical and syntactic level

Step 4: Carry out a corelation analysis between morphsyntactic features of slogan and their popularities

Analysis

This study employed mean dependency distance (MDD) as a measure of syntactic diversity, entropy (ENTR) to assess information amount, moving-average morphological richness (MAMR) and moving-average mean size of paradigm (MAMSP) to measure morphological richness, and mean word length (MWL) to measure lexical diversity. These were all computed using self-written computer programme scripts.

Syntactic complexity

Dependency distance is a concept under the framework Dependency Grammar (Tesnière 1959; Yngve 1960; Hudson 2007; Liu 2009b). It indicates the distance between the governor and the dependent. The governor acts as the core linguistic element in a sentence. It is usually conveyed by verb, predicate. The dependent is the subject, object, oblique, adverb, post/prepositional phrase, etc. In light of Liu, Hudson, and Feng (2009), the MDD of the whole sentence could be measured via |governor − dependent|, i.e.

$$\mathrm{MDD} = \frac{1}{n}\sum_{i=1}^{n} |\mathrm{DD}_i|$$

Syntactic arbitrariness: Entropy

The concept of information entropy was initially put forward by Shannon (1948) and its formula is as follows.

ENTR = $-\sum_{i=1}^{n} t_i \times \ln t_i$

The higher the ENTR, the more information that the research target carries.

Morphological richness

Moving-average morphology richness (Cech and Kubat 2018) are employed as the metric. It is suggested by Covington and McFall (2010), Yan and Liu (2021), Li, Liu and Li (2022) that, using a moving window can obtain a better average type-token ratio (TTR). The moving window of TTR in terms of word form can be obtained by the following formula:

$$MATTR\ (W)_{word\ form} = \frac{\sum_{I=1}^{N-W+1} F_i}{\mathrm{W}\ (\mathrm{N}-\mathrm{W}+1)}$$

The moving window of TTR in terms of lemma can be obtained in the same way, i.e.

$$MATTR\ (W)_{lema} = \frac{\sum_{I=1}^{N-W+1} F_i}{\mathrm{W}\ (\mathrm{N}-\mathrm{W}+1)}$$

Lexical diversity is obtained by $\frac{\sum_{I=1}^{N-W+1} F_i}{\mathrm{W}\ (\mathrm{N}-\mathrm{W}+1)} - \frac{\sum_{I=1}^{N-W+1} F_i}{\mathrm{W}\ (\mathrm{N}-\mathrm{W}+1)}$. Essentially, the higher the MAMR, the greater the lexical sophistication.

RESULTS AND DISCUSSION

With the methodology highlighted above, this section assesses the morphological richness, lexical sophistication, syntactic complexity, and information amount of Japanese advertising slogans. Section 3.1 examines slogans on the lexical level (metrics: MAMR, MAMSP, and MWL), while Section 3.2 addresses slogans on the syntactic level (metrics: MDD and ENTR). The correlations between the five metrics are then examined. Section 3.3 examines how morphosyntactic features connect to their popularity.

Japanese advertising slogans (lexical sophistication)

Lexical sophistication is measured by the MWL and morphological richness (MAMR, MAMSP) of four sentence types (declarative, imperative, exclamatory, and interrogative). The results are summarised in Table 1. With increasing MAMR, MAMSP increases, meaning that the two morphological metrics are internally consistent. Regarding word length, Spearman's rank correlation analysis reveals a negative correlation between MAMSP and MWL (cf. $\rho = -0.900$, $p = 0.037$), and no significant correlation between MAMR and MWL (cf. $\rho = -0.700$, $p = 0.188$).

Table 1. Lexical sophistication and syntactic complexity

Sentence types	MAMR	MAMSP	MWL
imperative	0.0000	1.0000	2.0638
interrogative	0.0022	1.0034	1.9267
exclamatory	0.0023	1.0032	1.9029
declarative	0.0030	1.0030	1.9526
volition	0.0104	1.0140	1.8059

Japanese advertising slogans (syntactic complexity and arbitrariness)

The MDD of slogans is measured to determine syntactic complexity, and entropy is examined to detect the information carried by each slogan. The findings reveal that imperative slogans present the simplest structure complexity and volitional slogans present the highest. Regarding syntactic arbitrary and information amount, it is exclamatory slogans that bear the highest and volition the lowest. Crucially, there is no significant correlation between MDD and ENTR, as confirmed by Spearman's rank correlation analysis (i.e. $\rho = -0.821$, $p = 0.089$).

Table 2. Syntactic complexity

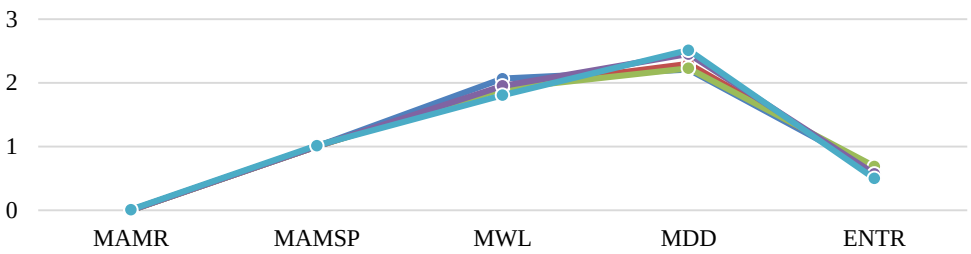
Sentence types	MDD	ENTR
imperative	2.2074	0.6365
exclamatory	2.2284	0.6890
interrogative	2.2946	0.6365
declarative	2.4526	0.5730
volition	2.5116	0.5004

To answer the question of whether a slogan's morphosyntactic features fit the complexity trade-off hypothesis proposed I numerous earlier studies (Sapir 1921, Jakobson 1936, MacFadden 2003, Sinnemäki 2014, Yan and Li 2021), Spearman's rank correlation test was conducted between MMR, MAMSP, MWL, MDD, and ENTR. The findings suggest that only MAMR and MDD show a positive correlation: $\rho = 0.900$, $p = 0.037$ (cf. Table 4 and Figure 4).

Table 4. Spearman's rank correlation analysis for MAMR, MAMSP, MWL, MDD, and ENTR

Lexical/syntactic	MDD	ENTR
MAMR	ρ = 0.900	ρ = -0.667
	p = 0.037	p = 0.219
MAMSP	p = 0.700	ρ = -0.359
	p = 0.188	p = 0.553
MWL	ρ = -0.600	ρ = 0.205
	p = 0.285	p = 0.741

Figure 4. Corelation between MAMR, MAMSP, MWL, MDD and ENTR



The correlation between MAMR and MDD reflects the agglutinative nature of the Japanese language, in which one or more suffixes are added to a verb/adjective stem to construct complex predicates, as in (3).

(3) 換え-させ-られ-まし-た-か

kae-sase-rare-mashi-ta-ka
change (stem)-causative-passive voice-honorification-tense. past-question marker

Figure 5 shows the positive correlation between morphological richness and MDD.

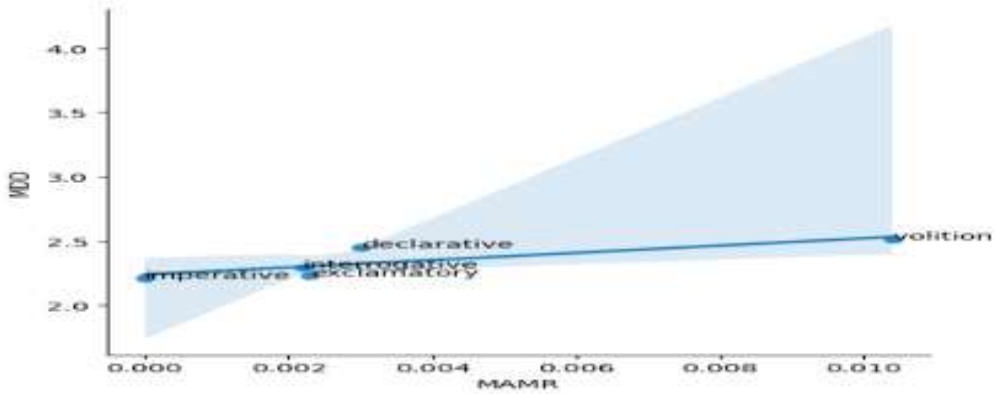


Figure 5. Spearman's rank correlation between MAMR and MDD

The association between slogans' morphosyntactic features and popularity

The previous section presented a picture of the morphosyntactic features of Japanese advertising slogans, indicating that morphological richness is linked to dependency distance. This section proceeds to examine whether morphosyntactic issues might affect slogans' popularity. To this end, this study extracted the TCC-Prize-winning slogans from 2018 to 2021. Table 5 presents the metrics of morphological richness and information amount of each year's slogan.

Table 5. Analysis of the TCC Prize-won slogans (2018-2021)

Year	MAMR	MAMSP	ENTR
2018	0.0127	1.0156	0.0
2019	0.0103	1.0124	0.6931
2020	0.0014	1.0016	0.5004
2021	0.0	1.0	0.3250

As suggested by Table 5, from 2018 to 2021, morphological richness as well as information amount decreased, which reveals a tendency of popularity among the Japanese, such that the simpler the slogan, the better.

CONCLUSION

This study applied mathematical linguistics to explore the morphosyntactic features of Japanese advising slogans. The targets were slogans from the TCC Yearbook from 2018 to 2021, which were measured on two levels using five metrics: MDD was employed to measure syntactic diversity; entropy for information amount; and MAMR, MAMSP, and MWL for lexical diversity. The findings indicate that imperative slogans present the simplest structural complexity, volitional slogans the highest; exclamatory slogans bear the highest syntactic arbitrary and information amount, and volitional ones the lowest. To answer the question of whether a slogan's morphosyntactic features reflect the complexity trade-off hypothesis, Spearman's rank correlation test was conducted between the five metrics: MMR, MAMSP, MWL, MDD, and ENTR. The findings suggest that MAMR and MDD show a positive correlation result.

This study examined whether morphosyntactic features might affect a slogan's popularity. Our analysis of the TCC-Prize-winning slogans from 2018 to 2021, found a downward trend in morphological richness and information amount, suggesting a tendency of popularity among the Japanese in the past 4 years, such that the simpler the slogan, the better. We hope that this can aid copywriters in producing effective advertising slogans.

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