



Does Collocation Congruency Between L2 and L3 Play a Role in Processing L3 Collocations?

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Abstract

Previous research has shown that L1-L2 congruency is a facilitative factor in collocation processing. The present study explores the congruency effect between learners' L2 and L3. Thirty-three proficient Norwegian learners with Lithuanian as their L1 and English as their L2 completed a phase acceptability task consisting of three groups of Norwegian collocations: congruent with L2, congruent with both L1 and L2, and incongruent with both. The results revealed that collocation L2-L3 congruency facilitates collocation processing.

Keywords: congruency, collocation, collocation processing.

Introduction

The congruency effect has been studied extensively in the context of collocation processing and learning. The results are pretty consistent: congruent collocations are learned more easily and processed faster than incongruent ones. However, to the best of our knowledge, the studies so far have only focused on items that are congruent between learners' L1 and L2. However, it is not uncommon for learners to already speak more than one language. In such cases, new collocations to be acquired can be

(in)congruent with any language the learner already knows. The present study sets out to explore the effect of congruency between L2 and L3 collocations on processing collocations in L3. To do so, we tested proficient Norwegian learners who all shared Lithuanian as their L1 and spoke English as their L2. While this study was largely exploratory, it is a step towards better understanding the interplay between different languages known to a person when processing collocations.

Congruency

Congruency can be defined as “the presence or absence of a literal L1 translation equivalent” (Peters, 2016, p. 114). Collocation congruency was mainly studied from two perspectives: learning and processing. In terms of learning, Peters (2016) looked at how congruency, among other factors, affected deliberate learning of collocations. She showed that congruency had a positive effect, at least for the form recall tests. In a more recent longitudinal study, Vu and Peters (2022) looked at learning collocations incidentally from reading and showed larger gains for congruent rather than incongruent collocations. Boone et al. (2023) also looked at the effect of congruency in a longitudinal study that tracked Dutch learners of German for as many as three years. They also showed that in all three times of testing, participants scored higher on congruent items.

As for collocation processing, in one of the first studies on the topic, Yamashita and Jiang (2010) looked at the effect of proficiency and congruency on collocation processing and showed that higher proficiency learners accepted both congruent and incongruent collocations equally fast. The authors suggested that learners have no problems accessing a collocation once they know it. However, even the proficient learners made more errors with incongruent collocations. Lower proficiency learners processed incongruent collocations both slower and with more errors. Wolter and Gyllstad (2011) came to a very similar conclusion: they suggested that congruency was more important for beginners, and once L2-only collocations were known, they were processed the same way as congruent collocations. However, in their later study, the authors showed the facilitative effect of congruency even with high-proficiency learners (Wolter & Gyllstad, 2013). Interestingly, Wolter and Yamashita (2018) found that congruent collocations showed more facilitation for L2 speakers than for native speakers. They suggested that potentially spreading activation in two languages can explain this effect. This claim still needs more evidence, but all these processing studies taken together show that congruency with L1 facilitates L2 collocation processing.

The Present Study

As any new collocation we learn might be congruent with collocations in other languages that we know apart from our L1, potentially, these other languages could also affect how easily we learn or process that collocation. In the present study, we explored whether learners process L3 collocations that are congruent with their L2 but not L1 faster than collocations incongruent between all three languages.

For this aim, we had learners of the Norwegian language (L3) perform a phrase acceptability task on Norwegian collocations. The study items consisted of collocations congruent with L2 (English), collocations congruent with both L2 and L1 (Lithuanian), and Norwegian collocations that were incongruent with both L1 and L2. We had the following hypothesis:

- If only the L1 congruency mattered, collocations would be accepted faster in the L1 and L2 congruent group only.
- If the congruency with any known language mattered, both congruent groups would show an increase in speed in acceptability judgments.

Method

Participants

In all, 33 Lithuanian native speakers (5 male and 28 female) took part in this experiment. They all spoke English as their L2 (at least to the B2 level) and Norwegian as their L3. Most participants were students learning Norwegian at a Lithuanian university, while the rest were employees of a Norwegian company based in Lithuania and were learning Norwegian at the company's language school. Some participants were university students and used Norwegian for work. On average, the participants had been learning Norwegian intensively for about 2.9 years.

Study Items

The Norwegian collocations were selected from *Sketch Engine Norwegian Web 2017 Bokmål corpus* (Kilgarriff et al., 2014). The selection criteria were frequency (collocations had to occur at least 100 times in the study corpus) and predicted familiarity for the study population (as evaluated by the second author who belonged to that population).

For the collocation to be judged as congruent, it needed to have a direct translation to Lithuanian or English, and its translation had to occur in Sketch Engine's Lithuanian Web 2014 corpus or in the BNC, respectively. As shown in Table 1, collocation groups were not matched in length or frequency. Therefore, these factors were included in the statistical model for statistical control. The study also included 45 implausible word combinations for the participants to reject.

Table 1 Study Items

Collocation type	<i>n</i>	Length	Frequency	Example
L1&L2 congruent	15	12.47	10.65 per million words	<i>sterk kaffè - strong coffee - stipri kava</i>
L2 congruent	15	10.93	3.67 per million words	<i>gã konkurs - go bankrupt - *eiti į bankrotą (bankrutuoti)</i>
Incongruent	15	11.93	10.42 per million words	<i>ta kontakt - *take contact (to contact) - *imtis kontakto (susisiekti)</i>

Ideally, we would also have wanted to have a group of collocations congruent with L1 only. However, this proved impossible, as English and Norwegian are typologically closer together than Lithuanian and Norwegian.

Procedure

The participants were presented with an online phrase-acceptability task on *Psychtoolkit* software (Stoet, 2017). They had to press *Yes* if they thought the word combination on the screen was common and frequently used in Norwegian. They were instructed to respond as quickly and accurately as they could, and there was a 4-second time limit for their response. The participants first saw four training items. After completing the task, the participants were given a short language background questionnaire.

Data Analysis

We analyzed participants' reaction times and the accuracy of their responses. In the reaction time analysis, we analyzed only the accurate responses (22.96% were inaccurate and thus discarded). Responses that were faster than 250 ms or took longer than 2.5 SDs above the mean (3.05% in total) were also discarded.

The experimental data were analyzed using *R* (R Core Team, 2013) version 3.4.4. A linear mixed-effects model was fitted for reaction times, and a generalized linear model with binomial distribution was fitted for the Accuracy data. Both used the *lme4* package (Bates et al., 2014), *p* values were estimated using the *lmerTest* package (Kuznetsova et al., 2015). All reaction times and frequencies were log-transformed before the analysis. The main predictor of interest was the type of collocation (congruent with L1 and L2, congruent with L2 only, or incongruent). Collocation length and frequency were entered into the model as covariates. The models included random intercepts for participants and collocations.

Results

Table 2 summarizes the reaction times and accuracy for the different types of collocations. On average, the participants took the longest to respond and made the most errors in the incongruent condition. Table 3 presents the results of the two mixed effects models: one looking at the reaction times and one at congruency.

The accuracy model showed no congruency effect. As for the reaction time model, there was a significant congruency effect, but interestingly, the participants reacted faster to collocations that were congruent between their L2 and L3 but not between all three languages.

Table 2 *Reaction Times and Accuracy*

Collocation group	RT (ms)	SD	Accuracy (%)
L1&L2 congruent	1,450.03	(525.62)	82.80%
L2 congruent	1,372.36	(519.26)	80.34%
Incongruent	1,509.21	(551.16)	74.46%

Table 3 *Mixed-Effect Model Results*

Model		Fixed Effects					Random Effects	
		<i>b</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>	Item <i>SD</i>	Participant <i>SD</i>
RTs	Intercept	7.68	0.17	42.73	45.33	<.001	0.11	0.17
	Congruency (L1&L2 congruent)	-0.04	0.05	40.66	-0.93	.357	—	—
	Congruency (L2 congruent)	-0.10	0.05	40.56	-2.12	.040	—	—
	Log frequency	-0.07	0.01	39.74	-5.10	<.001	—	—
	Length	0.02	0.01	41.46	2.78	.008	—	—
Accuracy	Intercept	-2.73	1.53	—	-1.79	.074	0.98	0.82
	Congruency (L1&L2 congruent)	0.58	0.41	—	1.42	.155	—	—
	Congruency (L2 congruent)	0.77	0.42	—	1.83	.067	—	—
	Log-frequency	0.41	0.12	—	3.34	.001	—	—
	Length	0.04	0.06	—	0.64	.524	—	—

Note: Congruency was a categorical variable with *Incongruent* as the base category; The *t* statistics for the Accuracy model are Wald *z* statistics from a logistic model with a binary dependent variable. RT model: R^2 marginal = .13, R^2 conditional = .43; Accuracy model: R^2 marginal = .08, R^2 conditional = .38.

Discussion & Conclusions

Despite the very explorative nature of the study, the results seem to suggest that congruency with other known languages matters when it comes to collocation processing. Collocations congruent with L2 were reacted to faster than incongruent items. This finding suggests that when studying aspects of collocation processing, we should remember that participants are rarely monolingual. It would hardly be possible to perfectly control for collocation congruency with multiple languages in a large group of participants. However, the study results are one more piece of evidence that when processing words in one language, we do not isolate them from all the other languages we know, even if these languages are entirely unused explicitly during the experiment.

No facilitative effect for the L1 and L2 congruent collocations was somewhat surprising, considering that all previous studies consistently showed such an effect. However, we would argue that the lack of this effect is possibly due to the experimental limitations of the present study. The groups of collocations were not matched perfectly,

and even if they were all expected to be familiar to the student group, the ones that were congruent with Lithuanian only might have been more difficult for the learners.

There are numerous ways to take this study further. First, it should be replicated with better-matched collocation groups to see whether the L1-L2-L3 congruent collocations would also show the effect. It could also be replicated with other language combinations to allow for L1-L3 congruent collocations. However, keeping the limitations in mind, the study suggests that the congruency effect seems to work between any languages we know, at least the ones we are proficient in.

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