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The functioning of structural priming in Czech

Fungovanie štrukturálneho primingu v češtine

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1. Introduction

Evidence from research and everyday observations demonstrate that individuals tend to align their speech with their conversational partners. This alignment manifests in various forms, including also syntactic repetition, which is the focus of the present thesis. This phenomenon, in which the perception of a specific syntactic structure increases the processing of the same structure, is called structural (or syntactic) priming (Bock, 1986; H. Branigan, 2007). Structural priming is evident in both comprehension and production: individuals process sentences more quickly if they have previously encountered a similar syntactic structure, and they are more likely to produce sentences with structures they have recently processed.

Bock (1986) was the first to experimentally confirm the existence of structural priming. Her research examined the alternation between prepositional and double-object dative structures (e.g., "A rock star sold some cocaine to an undercover agent" vs. "A rock star sold an undercover agent some cocaine") and between active and passive voice (e.g., "One of the fans punched the referee" vs. "The referee was punched by one of the fans"). The study revealed an 8% increase in the probability of using the same structure for voice alternations and approximately 22% for prepositional and double-object dative constructions.

Structural priming is an important tool for investigating language production processes and the mental representation of syntactic structures. Its significance lies in its ability to uncover hidden abstract syntactic representations and the relationships between sentence elements. Structural priming has been observed in both speech production and comprehension, as well as in cross-linguistic translation (for review, see Vasilyeva & Waterfall, 2012). Numerous studies have confirmed the priming effect across various languages, with a significant focus on the Germanic language family (e.g., English: Bock, 1986; German: Scheepers, 2003; Dutch: Hartsuiker & Kolk, 1998). However, there is also evidence from other language families, such as Mandarin (Cai et al., 2012) and SOV languages like Korean (Chung & Lee, 2017) and Basque (Santesteban et al., 2015).

Despite the extensive research on syntactic priming, studies on Slavic languages are sparse (Vasilyeva & Waterfall, 2012). This dissertation aims to address this gap, considering that Slavic languages, with their flexible word order, offer a unique

perspective on structural priming. The flexible word order of Slavic languages presents a distinct advantage in examining syntactic priming.

The abstract nature of structural priming has been confirmed by numerous studies, which highlight its independence from prosodic, semantic, or lexical language levels. Nonetheless, research suggests that the priming effect may be enhanced by various linguistic factors, such as animacy, information structure, event structure, prosody, and shared phonology (Pickering & Branigan, 1998). Slavic languages can also provide new insights into the role of morphology in structural priming, an area that is underexplored. Only two studies have investigated the effect of morphology, specifically of case-endings of nouns: one in Basque (Santesteban et al., 2015) and another in Korean (Chung & Lee, 2017). The results were inconclusive, with the Basque study failing to confirm the effect, while the Korean study did.

The case-marking morphemes in Czech are ideal for examining the morphological effect of structural priming. Czech marks noun cases with different endings based on grammatical gender and noun class. The repetition of a case-ending morpheme could potentially strengthen the link between morphemes and syntax, leading to a higher probability of using the same syntactic structure for nouns with identical case endings. That means that prime 1 (Sentence 1) should prime target 1 (Sentence 2) more than prime 2 (Sentence 3) should prime target 2 (Sentence 4), because prime 1 and target 1 share the same case-marking morphemes.

1. Same suffix prime: Inženýr posílá šéf *-ovi* obálk *-u.*
   (*The engineer sends an envelope to the boss.*)
2. Same suffix target: Sestřička podává doktor *-ovi* vod *-u.*
   (*A nurse is giving the doctor water*.)
3. Different suffix prime: Pošťák vydává sluh *-ovi* krabic *-i.*
   (*The postman gives the servant the box.*)
4. Different suffix target: Mechanik opravuje žen *-ě* motork *-u.*
   (*A mechanic repairs a motorcycle for a woman*.)

1.1 Goals and research questions

The aim of this thesis is to examine syntactic priming in the Czech language. Since syntactic priming was not previously studied in Czech, the main goal is to replicate the

results obtained in English and other languages. The next aims are to conduct experiments focused on elements that can affect priming, specifically on the effects of the verb repetition (lexical boost effect) and effect of repetition of the case marking morphemes (named morphological boost effect). Other effects, including the roles of working memory and social interaction, are also examined. Based on these goals, the following research question were formulated:

1. Is there an effect of structural priming in Czech language production?
2. Can repetition of a lexical element influence the structural priming effect in Czech (lexical boost effect)?
3. Can repetition of a morphological element influence the structural priming effect in Czech (morphological boost effect)?
4. Can working memory influence the structural priming effect?

2. Research

In total, six different experiments were conducted focusing on various aspects of priming. Each experiment used the same priming task, Picture description task, but they varied slightly in their designs. This chapter describes the methodology, analysis, and results of these experiments, combining descriptions of their features for brevity where necessary.

2.1. Method

First, the general methodology and design of all experiments are presented, followed by a description of the differences between the experiments (Table 1).

Table 1

Main differences between conducted experiments

	Investigated boost effect	Environment	Used hint words	Other investigated effects
Experiment 1	lexical	laboratory	-	SVO/OVS structure priming
Experiment 2	morphological	laboratory	-	working memory
Experiment 3	morphological	laboratory	yes	-
Experiment 4	morphological	laboratory	yes	-
Experiment 5	morphological	online	yes	suffix type (-e vs -ovi)
Experiment 6	morphological	laboratory	yes	suffix type (-e vs -ovi)

2.1.1. General description of experiments

The goal of the presented picture description task was to read the given sentence (prime) and describe the accompanying picture (target). Ditransitive sentences with varying structures were tested, where the patient (in the dative case) could either precede or follow the object (in the accusative case, Sentences 1 and 2). Structural priming was indicated by repeating the syntax between prime and target sentences. Neutral structures (Sentence 3) were included for comparison.

1. DAT/ACC prime: Veterinářka stříhá psovi drápy. (ENG: *A vet is clipping the dog's claws.*)
2. ACC/DAT prime: Veterinářka stříhá drápy psovi. (ENG: *The vet is clipping claws of the dog.*)
3. Neutral prime: Zajíc běží do lesa. (ENG: *The rabbit is running into the forest.*)

The task was disguised as a memory test. Participants were instructed to learn a set of pictures and sentences during the initial learning phase, with additional learning stimuli used as fillers that were later repeated in the second part of the experiment. In the subsequent testing phase, participants viewed a sequence of sentences and pictures, where some stimuli were new (prime-target pairs) and others were repeated from the learning phase (fillers). Participants read the sentences and described the following pictures while the speech was recorded. Filler items were included between the prime-target pairs.

Participants were students from the LABELS pool (Laboratory of Behavioral and Linguistic Studies) who received credit for their participation. The following section describes the differences in the design of the conducted experiments.

2.1.2 Experiment 1

The aim of the first experiment was to replicate the structural priming effect in the production of Czech sentences. Two types of structures were employed: ditransitive sentences (Sentences 1 and 2) and transitive constructions with alternating SVO/OVS word order (Sentences 4 and 5). Additionally, the first experiment aimed to replicate the lexical boost effect. Half of the sentences allowed for the repetition of the verb between the prime sentences and the target pictures, while in the other half, reusing the same verb was difficult to do.

4. SVO prime: Koza žrala trávu na louce. (ENG: *A goat was eating grass in a meadow.*)
5. OVS prime: Trávu žrala koza na louce. (ENG: *The grass was eaten by a goat in a meadow.*)

2.1.3 Experiment 2

In the second experiment, only ditransitive constructions were tested because SVO/OVS sentences were found unsuitable for priming. Experiment 2 investigated the morphological boost effect. The repetition of a case-ending morpheme could strengthen the link between morphemes and syntax, thereby increasing the likelihood of using the same syntax for nouns with the same case endings. This suggests that prime 1 (Sentence 6) should prime target 1 (Sentence 7) more effectively than prime 2 (Sentence 8) primes target 2 (Sentence 9), due to prime 1 and target 1 sharing the same case-marking morphemes.

6. Same suffix prime: Inženýr posílá šéf *-ovi* obálk *-u.*
(*The engineer sends an envelope to the boss.*)
7. Same suffix target: Sestřička podává doktor *-ovi* vod *-u.*
(*A nurse is giving the doctor water.*)
8. Different suffix prime: Pošťák vydává sluh *-ovi* krabic *-i.*
(*The postman gives the servant the box.*)
9. Different suffix target: Mechanik opravuje žen *-ě* motork *-u.*
(*A mechanic repairs a motorcycle for a woman.*)

The effect of working memory was also examined. Main theories of priming suggest that greater working memory capacity should result in stronger priming effects. Therefore, another goal of Experiment 2 was to explore the connection between priming and working memory. If such a relationship exists, individuals with better working memory might exhibit stronger priming effects compared to those with worse working memory. Working memory was assessed using the Digit Span Tasks (forward and backward) and the Word Span Task.

2.1.4 Experiment 3

Experiment 3 was almost identical to Experiment 2 with slight changes. Firstly, the study no longer examined the effects of working memory. Secondly, the design was altered to display the beginning of the target sentence under the target picture. This change was made because the morphological boost effect was not observed in the previous experiment, likely due to insufficient elicitation of ditransitive descriptions. The

hint words under the picture were intended to increase the number of sentences with ditransitive structure and thereby increase the occurrence of sentences with repeated case endings.

2.1.5 Experiment 4

Experiment 4 was almost identical to the previous experiment with a small change to its design. In the previous experiment, half of the target pictures were preceded only by a prime sentence with the same case-marking endings, while the other half were preceded only by primes that did not share the case-marking morphemes. It is hypothetically possible that certain pictures were depicted in a way that biased their description towards a ditransitive structure more than others. If, by chance, more images in either condition group were affected by this bias, it could impact the results. The type of picture following the prime sentence was thus balanced between conditions.

2.1.6 Experiment 5

Experiment 5 focuses on whether different suffixes may affect the priming effect to varying degrees. The study tested the difference between case endings that are single-letter syllables (-e) and those that are longer syllables (-ovi). Longer case endings are expected to be more salient in language processing and thus should produce a greater boost effect in priming. Due to the COVID-19 pandemic, this experiment was conducted online instead of in the laboratory.

2.1.7 Experiment 6

Since Experiment 5 did not provide evidence that different case-ending morphemes can enhance the priming effect to varying degrees depending on the suffix type, the question arose whether this might be due to its online setting, where overall priming effects were weaker compared to previous experiments. Thus, Experiment 6 was a replication of Experiment 5 under laboratory conditions.

2.2. Analysis

A generalized linear mixed-effects model (GLMM) was used for statistical analysis using R (R Core Team, 2021) and the packages lme4 (Bates et al., 2015) and car (Fox &

Weisberg, 2019). The analysis was conducted using two models (Experiments 1 to 4) or three models (Experiments 5 and 6). Participants and items were included as random intercepts in all models. The outcome variable was the type of target construction, categorized into two levels (AD/DA).

The first model tested for an overall priming effect in Czech language production, incorporating prime type (neutral/DA/AD) as a fixed effect.

In Experiment 1, the second model focused on the lexical boost effect, including prime type (AD/DA), verb repetition (same/different), and their interaction as fixed factors. In Experiments 2 to 6, this model focused on the morphological boost effect, including prime type (AD/DA), suffix repetition (same/different), and their interaction as fixed factors. In the second models, the neutral level of the prime type factor was omitted because it makes no sense to talk about verb/suffix repetition between "neutral" primes and their target sentences. All target sentences would automatically fall into the category different (no repetition). Thus, coding was changed from treatment to sum (prime type: ACC/DAT coded as 1 and DAT/ACC as -1; repetition of verb/suffix: different coded as 1 and same as -1).

The third model in Experiment 5 and 6 analyzed the effect of individual suffixes (-ovi vs -e). Fixed effects were sum coded and included prime type (AD coded as 1 and DA as -1), type of repeated morpheme (-e coded as 1 and -ovi as -1), and their interaction.

In the second experiment, Pearson's correlation coefficient was used to examine the relationship between priming tendency and working memory.

2.3 Results

The following section presents the results of the conducted experiments, highlighting only significant or interesting findings for brevity.

2.3.1 Experiment 1

There was almost no variability in the production of SVO/OVS sentences. A total of 595 SVO responses were collected, but only 9 were OVS. Hence, these constructions were not tested for the priming effect and were excluded from other experiments.

On the other hand, ditransitive primes showed a significant effect on the production of ditransitive sentences. A significant effect was found only for ACC/DAT structures compared to the neutral condition ($p < 0.001$, Table 2). Given that ACC/DAT

syntax is less frequent in Czech, this confirms the inverse preference effect, where less frequent structures elicit a stronger effect (Ferreira & Bock, 2006). The second model did not confirm the lexical boost effect.

Table 2

Results model for ditransitive sentences in Experiment 1

Parameter	Estimate	SE	P-value
Intercept	0.064	0.318	-
Factor DAT/ACC	0.193	0.295	0.513
Factor ACC/DAT	-1.092	0.303	0.001 ***

Note. The response variable is target structure.

2.3.2 Experiment 2

Experiment 2 found a significant overall priming effect for ACC/DAT structures, replicating the result from Experiment 1 (Table 3). The morphological boost effect was not observed, nor was there a correlation between working memory tasks and the priming tendency.

Table 3

Results model for ditransitive sentences in Experiment 2

Parameter	Estimate	SE	P-value
Intercept	-0.209	0.276	-
Factor DAT/ACC	0.392	0.246	0.111
Factor ACC/DAT	-0.555	0.259	0.032 *

Note. The response variable is target structure.

2.3.3 Experiment 3

In Experiment 3, a significant effect was again found for ACC/DAT structures, confirming previous observations and providing further evidence for an inverse preference effect. The analysis of the second model revealed a significant effect of priming structure ($p < 0.001$) and a significant effect of suffix repetition ($p < 0.001$), but no significant interaction between them ($p = 0.638$; Table 4). This suggests that priming

functions differently when the case-ending morphemes of nouns are repeated compared to when they are not.

Table 4

Second results model for ditransitive sentences in Experiment 3

Parameter	Estimate	SE	P-value
Intercept	-0.076	0.215	-
Factor ACC/DAT	-0.396	0.115	0.001 ***
Factor Same	-0.420	0.118	0.001 ***
Interaction Prime type & Suffix repetition	0.054	0.115	0.638

Note. The response variable is target structure.

2.3.4 Experiment 4

The overall priming effect was again observed in Experiment 4, but this time an effect was found for the DAT/ACC prime structures (p = 0.013) with no effect for the ACC/DAT structures (p = 0.173). This contrasts with previous results where the less frequent ACC/DAT structures showed larger effects. The second model revealed a significant effect of priming structure (p < 0.001), an insignificant effect of suffix repetition, but a marginally significant interaction between prime type and suffix repetition (p = 0.085; Table 5). This suggests the occurrence of a morphological boost effect.

Table 5

Second results model for ditransitive sentences in Experiment 4

Parameter	Estimate	SE	P-value
Intercept	-0.337	0.303	-
Factor ACC/DAT	-0.425	0.102	3.07e-05 ***
Factor Different	-0.044	0.108	0.682
Interaction Prime Type & Suffix repetition	0.176	0.102	0.085 .

Note. The response variable is target structure.

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2.3.5 Experiment 5

In online Experiment 5, only a marginal overall effect of ACC/DAT prime structures was found (p = 0.063, Table 6). No effects of morphology were observed, either effect of morphology in general nor effect of specific suffix types (-e vs -ovi). Experiment 5 did not provide evidence that different suffixes increase structural priming to different degrees.

Table 6

Results model for ditransitive sentences in Experiment 5

Parameter	Estimate	SE	P-value
Intercept	-0.174	0.253	-
Factor DAT/ACC	0.153	0.253	0.547
Factor ACC/DAT	-0.483	0.260	0.063 .

Note. The response variable is target structure.

2.3.6 Experiment 6

In Experiment 6, the first model showed a significant difference between the effects of the ACC/DAT prime and the baseline condition (p = 0.045), and a marginally significant difference between the DAT/ACC structure and baseline (p = 0.09). Consistent with the first three experiments, this again confirms an inverse preference effect. In the second model, only the effect of priming structure was statistically significant (p > 0.001). Results of the third model showed a significant effect of priming structure (p = 0.016) but not an effect of suffix type (p = 0.374; Table 7). However, the interaction between priming structure and suffix type was also significant (p = 0.014, Table 7). This suggests that priming works differently depending on whether the suffix -ovi or suffix -e is repeated, but it depends on the structure type.

Table 7

Third results model for ditransitive sentences in Experiment 6

Parameter	Estimate	SE	P-value
Intercept	0.604	0.327	-
Factor AD	-1.059	0.438	0.016 *
Factor -ovi	-0.263	0.297	0.374
Interaction Prime type & Suffix type	1.082	0.438	0.014 *

Note. The response variable is target structure.

3. General discussion

3.1 Overall priming tendencies

The first constructions tested were transitive SVO and OVS sentences. Of the 604 transitive target descriptions collected, only 9 had the OVS construction. This may be due to the fact that OVS sentences have the same information structure as SVO sentences, but the opposite syntactic role structure. Targeting an OVS structure to an object can sound strange if it is not accompanied by context, and people do not find this syntax acceptable. SVO/OVS structures have been found to be inappropriate for priming studies.

Another type of structure used was ditransitive sentences. Statistical analysis confirmed a priming effect in all six experiments, but in the online experiment (Experiment 5) the priming effect was only slightly significant ($p = 0.063$). ACC/DAT structures were primed to a greater extent than the opposite DAT/ACC structures in five of the six experiments. Given that ACC/DAT syntax is less frequent in Czech, this confirms the inverse preference effect, whereby less frequent structures elicit a stronger effect (Segaert et al., 2011). Thus, the structural priming effect was confirmed in Czech.

3.2 Lexical boost effect

The absence of evidence for lexical reinforcement in Experiment 1 might appear unexpected considering the strong evidence from prior studies. However, descriptive statistics indicate a lexical boost effect, implying that the lack of significant findings could be attributed to low statistical power. Whether the verb was repeated between the base and target sentences depended on the participants, and they did not repeat the verb frequently. A larger sample size might have led to increased verb repetition and greater statistical power.

3.3 Working memory and priming effect

The second experiment investigated the connection between structural priming and working memory (WM). The significance of WM in structural priming has been affirmed by various studies (e.g. Ledoux et al., 2007). When a verb is activated during the processing of a prime sentence, information regarding the structures in which the verb

can occur is also activated. This activation is maintained in WM and can induce the priming effect.

However, the results did not show a correlation between priming effects and tasks measuring WM. Nonetheless, the role of WM in structural priming might be more pronounced in children and less important in adults. Children require sufficient WM capacity to maintain primed syntactic structures above threshold activation in WM. Those with lower WM capacity may struggle to retain complex syntactic structures and to reproduce them (Foltz et al., 2015).

It's important to note that the evidence does not definitively conclude that WM plays no role in structural priming in adults. However, studies with children suggest that influence of WM on sentence processing may be less significant in adults compared to children.

3.4 Social factors and alignment in priming

The interactive alignment model proposed by Pickering and Garrod (2004) offers an explanation for why structural priming occurs, emphasizing that during dialogue, interlocutors' language aligns, facilitating both production and comprehension. This suggests that priming effects can be influenced by top-down factors such as the presence of another person.

In the present thesis, although the primary aim was not to test the interactive alignment theory, circumstances allowed for its examination. One testing session was moved online (Experiment 5), while another identical experiment was later conducted in a laboratory setting (Experiment 6). This setup enabled a comparison of priming effects between less social (online) and more social (laboratory) conditions.

Despite the nearly identical design of Experiments 5 and 6, their results differed. A generalized linear mixed model revealed a significant priming effect in the laboratory settings ($p = 0.045$), but only a marginally significant effect in the online conditions ($p = 0.063$). Additionally, the significant interaction between prime structure and suffix type was observed only in the laboratory experiment, not in the online one. These findings tentatively suggest that more social conditions (laboratory) produced a stronger priming effect.

It's worth noting that previous studies examining alignment effects typically involved dialogue, which was absent in the present experiments not designed explicitly to study alignment. However, the presence of another person, as noted by Ivanova et al. (2020), may be sufficient to enhance priming effects. This perspective aligns with Schoot et al. (2019), who found stronger priming effects in dialogue settings with a live speaker compared to monologue settings with a recording, attributing this difference to the communicative intent.

Furthermore, attention, as discussed by Ivanova et al. (2020), likely plays a crucial role in alignment effects. This explanation agrees with findings by Branigan et al. (2007), where direct addressees showed stronger priming effects than indirect addressees, presumably due to their heightened attention to the conversation.

In summary, priming effects appear to be influenced by top-down social factors such as the presence or absence of a conversation partner. The attention paid to utterances and the communicative context provided by interaction may modulate the strength of priming effects, highlighting the interactive nature of language use as theorized by the interactive alignment model.

3.5 Morphological boost

In this thesis, a central question was whether morphological factors influence structural priming, particularly focusing on whether case endings affect the selection of syntactic structures. Traditionally, syntactic structure selection has been viewed as occurring independently of inflectional morphology (Levelt, 1993). The hypothesis was that structural priming would be more pronounced when case-marking morphemes were repeated between prime and target sentences, compared to conditions where they were not repeated.

Experiment 2 did not yield statistically significant evidence for the morphological boost effect, although descriptive statistics suggested its presence. It is possible that more target sentences might be necessary to detect this effect adequately.

Subsequent experiments introduced hint words under target pictures to enhance the production of ditransitive sentences. Statistical analysis of third experiment provided strong support for a morphological boost effect ($p < 0.001$). However, this boost was observed only in DAT/ACC constructions and not in ACC/DAT sentences.

In the new Experiment 4, in which conditions were counterbalanced, statistical analysis revealed an interaction effect between structure and repetition of case-marking morphemes, but it was only moderately significant (p = 0.085). The experiments argued for a morphological boost effect, but none of them presented reliably robust evidence.

Because it was assumed that not all case endings have the same effect on the enhancing of the priming effect, in the following experiments, only the two previously used case-marking endings in the dative (-ovi and -e) were retained in the test stimuli and the possibility of their different functioning was tested.

The third model in Experiment 6 examining their differences showed a significant interaction between structure type and suffix type. The findings provide compelling evidence regarding the dfferent effects of case endings (-ovi and -e) on the structural priming of DAT/ACC and ACC/DAT structures. For the DAT/ACC structure, a priming effect was observed for both suffixes (-ovi and -e), but it was notably stronger in the -ovi condition (Fig 1). This indicates that repeating the -ovi case ending between prime and target sentences enhanced the likelihood of structural priming more effectively than repeating suffix -e. In contrast, for the ACC/DAT structure, a priming effect was only evident when the -ovi case ending was repeated. This suggests that -ovi has a specific boost effect on structural priming for this syntactic structure, whereas suffix -e does not have the same effect.

These findings support the conclusion that different case-marking morphemes can have varying effects on structural priming. The stronger effect observed with -ovi compared to -e may be attributed to several factors. Suffix -ovi is phonologically more prominent as a syllable and may be more salient in attention during sentence processing. This increased salience could lead to greater activation of the structural representation associated with -ovi in subsequent sentences, thereby enhancing the priming effect.

This work has shown a correlation between the processing of case-marking morphemes and the choice of syntactic structure. Although the results can add missing information to the discussion of the interactivity between morphological and syntactic levels, they have several limitations. In Czech, the processing of noun morphology may be more important than in other languages. This is because it provides information about the constituent role of the noun that cannot be obtained from other grammatical factors, such as word order. It is also unclear whether the strengthening effect of noun endings in Czech

is transferable to other word types. Future research in these areas is needed to obtain answers.

Figure 1

Relative frequencies of targets following prime sentences in conditions with dative ending -ovi or -e in same suffix condition in Experiment 6
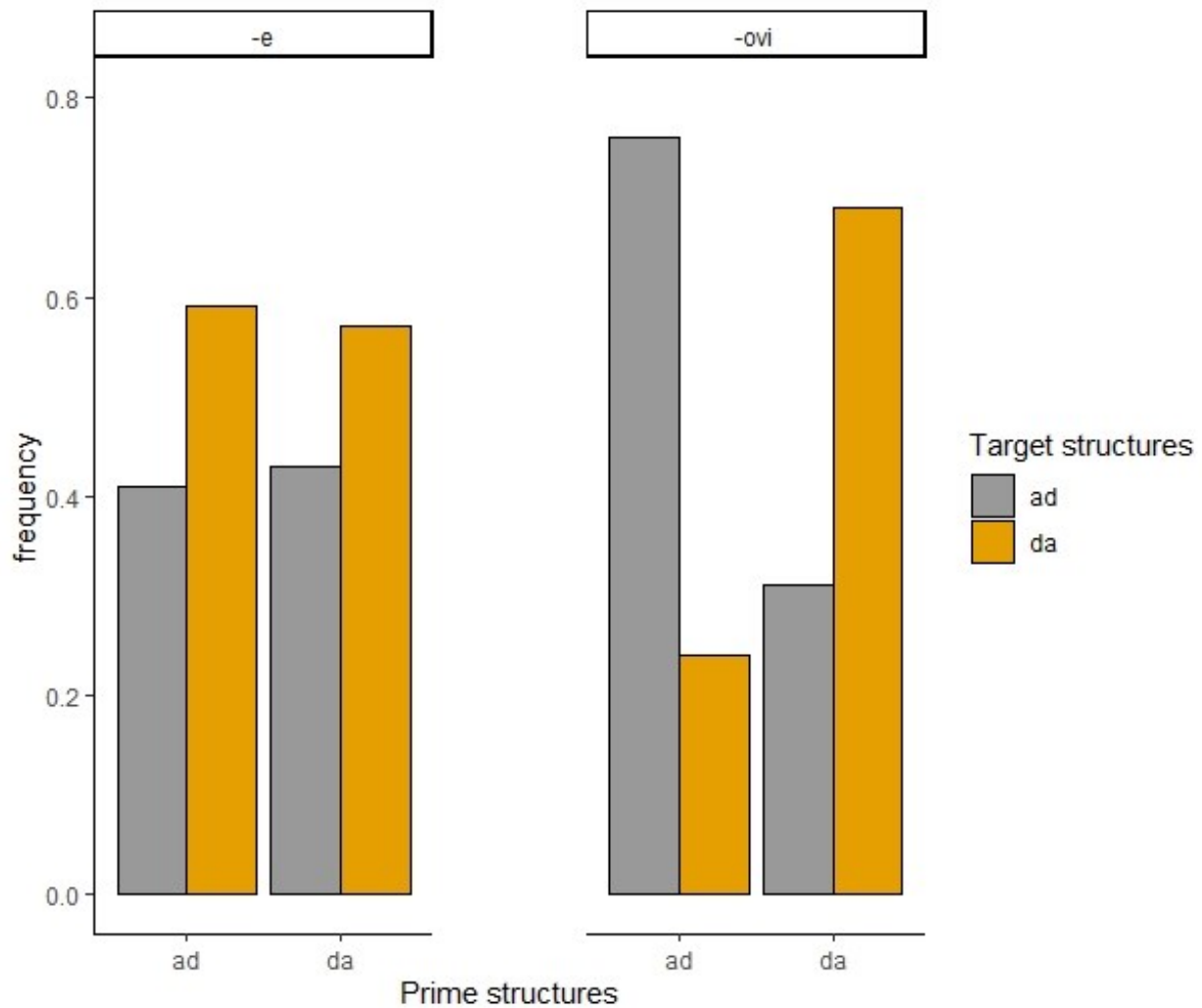
Note. Frequencies are calculated for each prime condition separately. Shortcuts represent ditransitive accusative/dative structure (ad) or ditransitive dative/accusative structure (da).

4. Conclusion

The thesis findings reveal several key insights into structural priming effects and the influence of morphological and other factors. The thesis established structural priming effects for ditransitive structures involving DAT/ACC and ACC/DAT structures. It also identified an inverse preference effect, where less frequent ACC/DAT structures were primed to a greater extent. No priming effect was observed for SVO/OVS structures, probably because they are strongly marked for the information structure.

Despite robust evidence from prior studies, this thesis did not confirm a lexical boost effect or an effect of working memory on structural priming. The reason may be the limited number of collected sentences. Additionally, the absence of working memory effects aligns with the idea that such influences might be more pronounced in children rather than adults.

The experiments showed that priming effects were stronger in laboratory settings compared to online settings. This supports the interactive alignment theory, which states that priming is enhanced in social situations. Interestingly, the mere physical presence of a potential interlocutor was sufficient to boost priming effects, suggesting that dialogue itself might not be necessary for alignment to occur.

A significant finding was also that repeating case-marking morphemes of nouns enhanced the structural priming effect. This indicates that syntactic and morphological processes are not entirely independent and are processed at least partially in parallel. However, not all case-marking morphemes had the same boosting effect; more prominent endings like -ovi enhanced priming, whereas less salient endings like -e did not show the same effect.

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Appendix: Academic CV

PUBLICATIONS

Smolík, F., & Filip, M. (2022). Corpus-based age of word acquisition: Does it support the validity of adult age-of-acquisition ratings? *Plos One, 17*(5), e0268504.

Duñabeitia, J. A., Baciero, A., Antoniou, K., Antoniou, M., Ataman, E., ... Filip, M., ... & Pliatsikas, C. (2022). The multilingual picture database. *Scientific data, 9*(1), 1-6.

Gerwien, J., Filip, M., Smolík, F. (2023) Noun imageability and the processing of sensory based Information. *Quarterly Journal of Experimental Psychology,* 17470218231216304.

TEACHING EXPERIENCE

Charles University, Faculty od Arts, Department of Psychology
Neuroimaging and physiological methods in cognitive psychology – 2023, 2024
EEG and its psychological correlates II - 2023
Psychological Methodology (seminar) – 2023
General psychology - 2024

Palacký University Olomouc, Department of General Linguistics
 Psycholinguistics - 2023