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Editorial

Iarina Albu & Estée Lindhout

LingUU is the official, peer reviewed student journal of linguistics at Utrecht University (UU). In this journal, undergraduate, graduate, and PhD students can publish their papers. Students have ideas worth sharing, and develop creative theories that should not gather dust in a professor's drawer. LingUU provides a platform for this, while giving students the opportunity to get to know, at a smaller scale, the world of academic publishing. Apart from the author's side of publishing, the journal offers students the possibility of developing the skill of peer reviewing in a real setting. The journal aims to feature articles from the different sub-disciplines of linguistics in both Dutch and English. Apart from research articles, LingUU features articles on internships, experiences studying abroad, and book reviews.

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THE COGNATE INHIBITION EFFECT ON THE PROCESSING OF DIFFERENT WORD CLASSES IN A MIXED-LANGUAGE SITUATION

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ABSTRACT

The present study investigates if noun and verb cognates are processed differently by bilinguals. In line with the non-selective access hypothesis, which argues for simultaneous language activation in the bilingual mental lexicon, cognate effects are expected to facilitate processing in single-language environments whilst hindering processing in multi-language environments. According to Van Asshe et al. (2013), noun cognates have more overlapping features than verb cognates. Therefore, the processing of noun cognates is expected to be affected more greatly by cognate effects than verb cognates.

Thirty-five Dutch-English sequential bilinguals completed a lexical decision task (LDT) featuring noun and verb cognates in a mixed-language situation. Results show that cognates, regardless of word class, were processed significantly slower than non-cognates. This supports the non-selective access hypothesis as it evidences an interaction between the two lexicons of a bilingual. However, contrary to expectations, no difference in reaction time was observed between noun and verb cognates. This challenges assumptions about the difference in the degree of feature overlap between word classes. Additionally, a learning effect was observed, with faster response times as the experiment progressed. These findings provide further evidence of the integrated nature of the bilingual lexicon and suggest assumptions on the organization of word classes can be questioned.

Keywords: bilingualism; cognates; mental lexicon; cognate effect; word class.
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1. INTRODUCTION

Over the course of the last decades, there has been a significant surge in experimental research focusing on bilingualism.[3] One of the main questions addressed has been how lexical representations are organized within the mental lexicon of bilinguals. Two main hypotheses have dominated the debate. One theory, known as the language selective access hypothesis, suggests bilingual language processing activates only the lexical representations from the target language, implying that bilinguals operate with two separate lexicons that do not interact (Gerard & Scarborough, 1989; Scarborough et al., 1984). The other theory is the language non-selective access hypothesis, which entails that bilinguals' (two) languages are integrated within a common lexicon, enabling interactions between the languages during their processing. This last hypothesis, which is the most widely accepted, is formally encompassed in the Bilingual Interactive Activation plus (BIA+) model (Dijkstra & Van Heuven, 2002).

The BIA+ model (Dijkstra & Van Heuven, 2002) proposes that a bilingual speaker's languages are represented as a network of interconnected lexical nodes. When a bilingual encounters a word, associated orthographic nodes are activated. The process of identifying words and their associated languages occurs in a bottom-up manner, starting with the basic elements of words and moving towards identifying the word itself and its language. In this view, different stages are involved in word recognition: "after orthographic representations become active, they start to activate associated phonological and semantic representations" (Dijkstra & Van Heuven, 2002, p. 183). Similarly, since representations in a second language (L2) generally have a lower frequency compared to first language (L1) representations, they tend to activate slightly slower.

One of the core phenomena that supports this model is the cognate facilitation effect. Cognates are words across languages that resemble each other in phonological and/or orthographic form and carry similar meanings (Hall, 2002).[4] Many studies have proven that bilinguals are faster at recognizing and producing cognates than non-cognates (Cristoffanini et al., 1986; Costa et al., 2000; De Groot & Nas, 1991; Dijkstra et al., 1999). This effect can be explained by the BIA+ model: since cognates are words that have orthographic, phonological, and semantic overlap across languages, word identification is facilitated because of higher activation of these shared features. This facilitation effect suggests that, on the one hand, bilingual individuals have a single and shared lexicon that integrates both languages' representations and, on the other hand, that lexical access is nonselective (De Groot, 2011), since both languages are activated simultaneously, regardless of the language in use. Furthermore, this facilitation effect provides evidence against the language selective access hypothesis. According to this hypothesis, the lexicons of a bilingual are accessed independently, implying no facilitation effect should occur with cognates. However, contrary to these predictions, processing times are faster for cognates. As cognates belong to different languages, this effect provides evidence for an interaction between the two lexicons of a bilingual.

The cognate facilitation effect has been found in experiments, primarily in lexical decision tasks (LDTs), where the stimulus list is presented in one language. However, a contrasting effect has been observed with mixed language stimuli. Here, the facilitation effect shifts towards inhibition (Dijkstra et al., 1998; Vanlangendonck et al., 2020). This means that, instead of being processed faster than non-cognates, cognates take longer to process when multiple languages are activated. The explanation of this phenomenon aligns with the concept of a nonselective lexical access to an integrated lexicon: since both languages are simultaneously activated, lexical competition increases and subsequently so do interference effects (Dijkstra & van Heuven, 2002). The need to inhibit the cognate representations in the non-target language in order to recognize the target stimulus causes an increase in processing costs, resulting in slower response times. In other words, when multiple languages are activated simultaneously, it requires greater effort, and therefore more time, to resolve the competition between them and suppress the non-target language.

Aiming to better understand the complexities of bilingual mental representations, the focus of cognates in bilingual research has been of diverse nature. Whilst investigations have spanned various task types (e.g., visual, auditory, and production tasks), a central question has been the interactions between and influences of a speaker's L1 and L2. In this sense, a stronger cognate facilitation effect has been observed in experiments that focused on the L2 than on the L1 (De Groot et al., 2002; Krogh, 2022). As accounted for by the BIA+ model, L2 representations are activated with a delay compared to L1 codes, so no facilitation effect is observed in the L1 (De Groot et al., 2002).

Differences in cognate effects have also been found regarding grammatical word class. In a single language condition, noun cognates have been shown to positively affect reaction times (Dijkstra et al., 1999; Lemhöfer & Dijkstra, 2004; Van Assche et al., 2011). Van Assche et al. (2013) conducted an LDT with Dutch-English bilinguals to extend the analysis with verb cognates. As expected, the positive effect was found, albeit to a lesser extent than for nouns. Van Assche et al. (2013) argued that the degree of overlap between formal and semantic representations is smaller in verbs than in nouns, leading to smaller facilitation effects.

The question that emerges is whether the difference in processing costs for nouns and verbs persists in a mixed-language situation. In line with the inhibition effects identified in earlier research, processing time for noun cognates has been shown to suffer negatively (Poort et al., 2015; Vanlangendonck et al., 2020; Krogh, 2022). However, to the best of the current knowledge, no study has yet examined whether verbs undergo a similar negative effect. The present study aims to address this gap.

2. RESEARCH QUESTION AND HYPOTHESES

To deepen the understanding of language mental representations in bilinguals, the present study seeks to answer the following research question: "To what extent do noun and verb cognates differently affect processing time in a mixed-language situation?". This investigation aims to determine if retrieval from the bilingual mental lexicon is influenced by word class, which would suggest that different conceptual features may be involved in the mental representations of nouns and verbs, affecting semantic overlap and, thus, processing costs. This could imply a deeper, structural distinction within the bilingual lexicon, where differentiated cognitive processing strategies are used for nouns and verbs.

Based on findings of slower recognition of noun cognates compared to non-cognates in a mixed-language condition (Poort et al., 2015; Vanlangendonck et al., 2020; Krogh, 2022), it is predicted that the reaction time for noun cognates will be longer compared to noun non-cognates. Similarly, longer reaction times are predicted for verb cognates compared to verb non-cognates. Based on these predictions, an interaction is expected between the negative facilitation effect of noun cognates and verb cognates. Specifically, mirrored inhibition effects are anticipated (Vanlangendonck et al., 2020): since the facilitation effect in noun cognates is bigger than in verb cognates in a single-language condition, the negative impact is hypothesized to also be greater for noun cognates than for verb cognates in a mixed-language situation. Such results would support the concept of an integrated lexicon, wherein the extent of feature overlap — and therefore the degree of facilitation or inhibition — varies between word classes.

3. METHOD

The hypotheses were tested by conducting a visual LDT, created using jsPsych presentation software (De Leeuw et al., 2023). Participants were asked to judge whether the presented word exists in English. Consequently, both Dutch words and pseudowords were expected to be judged incorrectly. Although the task was in English, the informed consent, the survey, and the instructions were presented in Dutch to create a stronger mixed-language situation. To prevent confounding learning effects, stimuli were presented in a pseudorandomized order, with a maximum of two succeeding items from one condition.

The experiment employed a 2x2 factorial design, comprising two independent variables: lexical relation and word class, each with two levels: cognate – non-cognate and noun – verb, respectively. Consequently, the study contained four experimental conditions: noun cognates, verb cognates, noun non-cognates, and verb non-cognates. Furthermore, the study followed a within-participant design: all participants were exposed to the same set of stimuli.

3.1. Participants

Thirty-five native speakers of Dutch (25 female, 10 male) participated in the experiment. Participants were recruited through convenience sampling and were selected based on level of English proficiency. All participants had passed their VWO ('pre-university education') English final exam, ensuring a minimum Common European Framework of Reference for Languages (CEFR) level of B2–C1 proficiency (Onze Taal, n.d.). This level indicates all were independent to proficient users of English (Council of Europe, 2001). All participants acquired English later in life, classifying them as sequential bilinguals. Participants' ages ranged from 19–28 years (M = 23;7, SD = 0;8). None of the participants had been diagnosed with dyslexia, and two participants were left-handed.

Data from two participants were excluded from the analysis as their overall error rates were exceptionally high compared to other participants (above 30%). The remaining 33 participants consisted of 23 female and 10 male speakers with a mean age of 23;10 (SD = 0;1.9).

3.2. Materials

The stimuli contained 240 visual items. In line with previous work on cognate effects in mixed-language situations using an LDT, 30 items were selected per condition (Vanlangendonck et al., 2020), resulting in 120 experimental items. The items were constructed based on prior studies (e.g., noun items from Vanlangendonck et al., 2020, and verb items from Van Assche et al., 2013).

However, contrary to methods in previous research, only non-identical cognates were considered for the purpose of the present study; identical cognates may not be perceived as English words by the participants, considering Dutch is their dominant language.

In line with the definition of cognates in the present study, cognates with semantic and orthographic overlap were selected. To control for the similarity of the cognates, the Levenshtein Distance (LD) was used to quantify the cross-linguistic orthographic overlap between the non-identical cognates and their Dutch translations. The LD refers to the number of characters that have to be replaced, added, or deleted to transform one string of characters into another string. Following Vanlangendonck et al. (2020), an LD of 1-2 was used for items in both cognate conditions. Moreover, as word length can influence reaction time, in line with prior research, the length of the stimuli was restricted to English items of 4-6 letters with Dutch translations of 4-7 letters (e.g., Poort & Rodd, 2017; Vanlangendonck et al., 2020).

Furthermore, as frequency effects have been found for recognizing words in LDTs (Lieber, 2004), the frequency of the target experimental items was controlled for using logarithmic word frequency scores obtained from the SUBTLEXus database (Brysbaert & New, 2009, cf. Poort & Rodd, 2017; Vanlangendonck et al., 2020). Subsequently, t-tests in JASP (version 0.18.3, JASP Team, 2024) revealed no significant differences in the frequencies of cognates compared to non-cognates (t(118) = -.83, p = 0.408) and nouns to verbs (t(118) = -.71, p = .481).

Finally, four filler conditions were added of 30 items each. Based on Poort and Rodd (2017), Dutch non-cognate nouns and verbs (4–6 letters) were included to create a mixed-language situation. Furthermore, 30 pseudowords with nominal properties and 30 pseudowords with verbal properties were created using Wuggy (Keuleers & Brysbaert, 2010), adhering to the syllabic structure and phonotactic constraints of English. However, to balance the amount of English and Dutch items in the experiment, the pseudowords were selected and modified to also comply with Dutch phonotactic constraints as much as possible.

3.3. Procedure

While three subjects participated in a soundproof booth in a language lab using university computers, thirty-two participants took part in the experiment using their personal laptops in an uncontrolled environment. After starting the JsPsych experiment, participants were first presented with the information letter and informed consent, which they signed before continuing with the rest of the experiment.

Subsequently, participants' background information was collected through a survey. Participants were asked their sex and age, whether their only native language was Dutch, whether they had passed the VWO English final exam, and whether they had dyslexia. Participants were excluded from the experiment if they were younger than 18 years old, if they had a native language other than Dutch, if they had not passed the VWO English final exam, or if they had dyslexia. Moreover, participants were asked about their handedness, which affected the position of the 'yes'/'no' answer keys in the experiment.

After selecting the corresponding keyboard and assigning the 'yes' and 'no' response keys to their index fingers, participants received instructions for the LDT. They were asked to judge whether the words presented on the screen were existing English words by pressing the corresponding button on their keyboard as fast as they could, without making mistakes.

Before commencing with the task, participants completed eight practice trials, one from each condition. In the practice rounds, the correctness of the answers was immediately displayed after each trial. During the experiment, participants encountered 240 stimuli sequentially, presented in a pseudorandomized order. Each trial had a maximum duration of 3500 milliseconds (ms), encompassing an intertrial interval of 500 ms, a fixation cross of 1000 ms, and the presentation of the stimulus for a maximum of 2000 ms. If participants failed to make a judgment within this timeframe, the subsequent stimulus would be presented, and the answer would be excluded from the analysis. In total, the whole experimental procedure took approximately 12 minutes.

3.4. Data Analysis

As mentioned in section 3.1, a data-driven decision was made to exclude data from two outlier participants from analysis as their performance was under 70% correct. Moreover, adopting Vanlangendonck et al.'s (2020) exclusion criteria, items that elicited at least 40% errors were removed from the data for analysis. These

removed items included two experimental items: verb cognate 'wreak' and noun cognate 'wart', as well as three pseudowords with verbal properties ('fleat', 'swom', and 'jude'). Furthermore, two outlier responses with exceptionally fast reaction times under 300 ms were excluded.

Reaction time data were statistically analyzed using RStudio (R Core Team, 2022), through linear mixed-effect modeling using the lme4 package (Bates et al., 2015). As linear mixed-effect modeling presumes normally distributed data, reaction times were logarithmically transformed after inspection of the residuals to meet the normality assumption. Subsequently, models were built in a stepwise fashion, starting with a null model only containing random intercepts (subject and experimental item) and sequentially adding fixed factors. Model comparisons were conducted using likelihood ratio tests using the anova() function in R, to identify the best-fitting model.

4. RESULTS

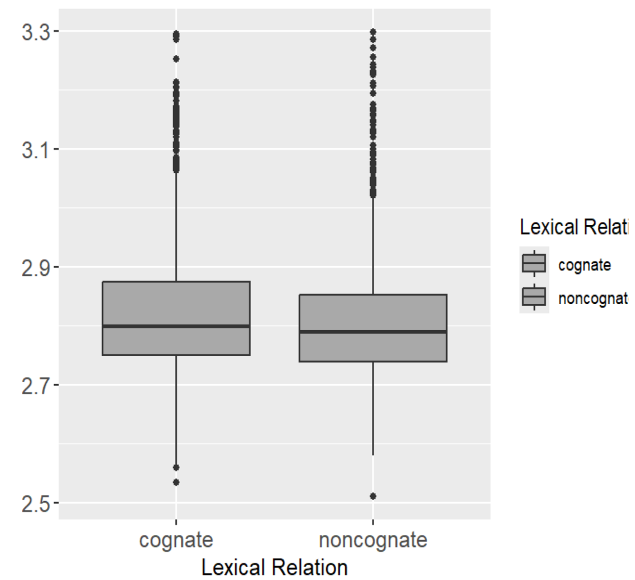
The effect of the two-level independent variables — lexical relation (cognates and non-cognates) and word class (nouns and verbs) — on the dependent variable reaction time was analyzed.

4.1. Lexical Relation

A likelihood ratio test indicated that the inclusion of lexical relation as a fixed effect significantly improved model fit, $\chi2$ (1) = 3.85, p = .049, suggesting a significant difference in reaction times between cognates and non-cognates (See Figure 1). The back-transformed standard estimates indicate that the expected reaction time for cognates was 677 ms whilst non-cognates were recognized 18 ms faster (i.e., in 658 ms). These results reveal cognates were recognized significantly slower than non-cognates in a mixed-language situation.

Figure 1

The Reaction Times of Cognates and Non-Cognates



4.2. Word Class

Moreover, the effect of word class on reaction time was examined. Although the data indicated that nouns were recognized 19 ms faster than verbs, a likelihood ratio test revealed that adding word class to the model did not significantly improve model fit, $\chi2$ (1) = 0.14, p = .71. This suggests there are no significant differences in processing time between different word classes.

Next, interaction effects between lexical relation and word class were investigated. Including the interaction term did not significantly improve model fit, $\chi2$ (1) = 0.05, p = .83, indicating that the difference in reaction times between cognates and non-cognates did not depend on whether the words are nouns or verbs.

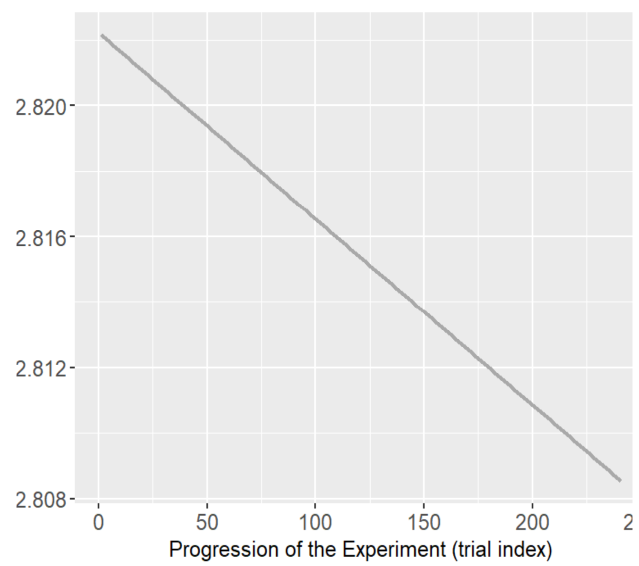
4.3. Learning Effects

In prior research using LDTs, a learning effect has been observed (see Forbach et al., 1974; Murray & Forster, 2004). Reaction times decreased while the experiment progressed (Forbach et al., 1974). To investigate if this learning effect could also be observed in the present study, the experiment was divided into two phases: the beginning of the experiment, comprising the 120 items first presented to the participants, and the end, consisting of the final 120 items. This independent variable of 'trial index' was added to the best-fitting model as a fixed factor. A likelihood ratio test revealed this addition significantly improved model fit, $\chi2$ (1) = 5.17,

p = .02, suggesting participants got faster at recognizing words as the experiment progressed (see Figure 2).

Figure 2.

The Mean Reaction Time over the Experiment



After the cognate effects were applied, the back-transformed standard estimate indicates that reaction times at the beginning of the experiment were, on average, 1ms slower compared to reaction times at the end of the experiment. This finding shows that a learning effect also emerged in the present study.

Additionally, interactions between lexical relation and trial index were analyzed. A likelihood ratio test revealed adding this interaction did not significantly improve model fit, $\chi2$ (1) = 2.80, p = .09, suggesting reaction times to both cognates and non-cognates improved over the course of the experiment independently of lexical relation.

Furthermore, to investigate if there was an interaction effect between word class and trial index, where reaction times to nouns and verbs might improve to different extents over the course of the experiment, a model was built containing random effects for subject and experimental item, a main effect for cognates and an interaction between word class and trial index. A likelihood ratio test showed that the addition of the interaction did not significantly improve model fit, $\chi^2(2)$ = 0.16, p = .92, suggesting that there was no interaction between word class and trial index. An overview of all models tested can be found in Table 1 below.

4.4. Random Slopes and Individual Variation

Furthermore, aiming to explore individual variation within the sample, a random slopes model was built.

Table 1

An overview of the built models

Model	Random effects	Fixed effects	χ^2	df	p
0	Subject + Experimental item	-	-	-	-
1	Subject + Experimental item	Lexical relation	3.85	1	**.049***
2	Subject + Experimental item	Lexical relation + Word class	0.14	1	.71
3	Subject + Experimental item	Lexical relation * Word class	0.05	1	.83
4	Subject + Experimental item	Lexical relation + Trial index	5.17	1	**.02***[6]
5	Subject + Experimental item	Lexical relation * Trial index	2.80	1	.09
6	Subject + Experimental item	Lexical relation * Trial index + Word class	0.16	2	.92

A random slope for lexical relation was added to the best-fitting model to check whether the extent and directionality of the effect of cognates on reaction time might differ between participants. A likelihood ratio test showed the inclusion of the random slope did not significantly improve the best-fitting model, $\chi2$ (2) = 0.003, p = .998. This indicates there were no significant differences in the strength and directionality of the observed cognate effect between different subjects.

After this, a random slope was added for trial index to check whether the extent and directionality of how reaction time over the course of the experiment differs between participants. A likelihood ratio test showed the inclusion of the random slope did significantly improve the best-fitting model, $\chi2$ (2) = 15.41, p < .001. This indicates there were significant differences in the strength and directionality of the observed learning effect.

In summary, it can be recognized that the best-fitting model consists of random intercepts for subject and experimental item, and main effects for cognate and trial index, with no interactions (see Table 1) and a random slope for trial index. This suggests there is a difference in reaction time between cognates and non-cognates. The estimates indicate that cognates are recognized slower compared to non-cognates. Overall, the reaction times decreased as the experiment progressed, though this differed between participants (see section 4.3). No effects of word class were observed.

5. DISCUSSION

Because little is known about the effect of cognates on bilinguals' processing of different word classes, the present study set out to investigate the cognate effect on nouns and verbs on Dutch-English bilinguals by conducting a visual LDT in a mixed-language situation. Considering the cognate facilitation effect found in previous research in a single-language condition (e.g., Dijkstra et al., 1999; Lemhöfer & Dijkstra, 2004; Van Assche et al., 2011), as well as the cognate inhibition effect found in mixed-language conditions (e.g., Krogh, 2022; Poort et al., 2015; Vanlangendonck et al., 2020), a hypothesis was formulated within the BIA+ model (Dijkstra & Van Heuven, 2002). To answer the research question of to what extent noun and verb cognates differently affect processing time in a mixed-language situation, it was hypothesized that both noun and verb cognates would negatively affect processing time, with nouns experiencing a greater negative effect than verbs. The results of the present research show that participants indeed responded significantly slower to cognates than to non-cognates. However, cognates of different word classes did not show significant differences in the size of their inhibition effects. This suggests that at least under the current experimental conditions, noun and verb cognates may undergo similar levels of lexical competition during bilingual word recognition.

The results show participants' response time to both noun cognates and verb cognates was significantly slower than to non-cognates in a mixed-language condition, suggesting interference from lexical relation. This finding is in line with previous research (e.g., Poort et al., 2015; Krogh, 2022; Vanlangendonck et al., 2020), and the effect can be explained within the BIA+ model (Dijkstra & Van Heuven, 2002): as predicted, cognates show an inhibition effect in a mixed-language situation, interfering with the speed of processing as more time is required to inhibit the cognate of the non-target language as both languages are equally activated. Therefore, the results of the present study provide further evidence in favor of the nonselective access hypothesis, arguing that different languages are stored in the bilingual mental lexicon as an integrated system. Consequently, the findings simultaneously argue against the selective access hypothesis.

Moreover, a learning effect was found, with processing times decreasing as the experiment progressed, indicating that participants gradually adapted to the task. This effect was independent of word class or lexical relation, suggesting it is an intrinsic characteristic of LDTs. In fact, this trend of faster response times over time has also been observed in earlier lexical decision studies (e.g., Forbach et al., 1974; Murray & Forster, 2004).

Furthermore, contrary to Van Assche et al. (2013), who argue that cognate facilitation effects are smaller for verbs than for nouns, the present study has been unable to confirm their findings: word class did not significantly affect the extent of the cognate effect. Van Assche et al. (2013) claim that verb cognates show a smaller cognate effect because they share less phonetic, orthographic, and semantic overlap than noun cognates (Gentner 1981 as cited in Van Assche et al., 2013). However, the current findings do not align with this claim. Considering that the present study has better controlled for the overlap of cognates' orthographic features (i.e., using the strict criterion of 4–6-letter cognates with an LD of 1–2 to their translation, whereas Van Assche et al., 2013 selected 3–7-letter cognates without controlling for orthographic similarity), it may be inferred that the semantic features of nouns or verbs, in fact, do not differ. The different cognate facilitation effect size between noun and verb cognates reported by Van Assche et al. (2013) is more likely explained by a difference in degree of orthographic overlap in their stimulus list, with nouns overlapping more than verbs. Seeing as the BIA+ model suggests the first stage of word recognition is activation of orthographic features, this may have influenced processing times. Nevertheless, the inconsistencies encourage further investigations to see whether there are differences in activations among different word classes for better understanding of the bilingual mental lexicon.

The present research also includes certain limitations. For example, the participant sample was of a small scale and only included sequential Dutch-English bilinguals within a limited age group, and of similar English proficiency levels. Given that different levels of L2 proficiency may correspond to different thresholds for lexical activation and suppression in bilingual processing, future research is encouraged to replicate the study with a more diverse participant pool. Including simultaneous bilinguals and learners at different stages of L2 acquisition could better assess the robustness and generalisability of the observed cognate inhibition effects. Moreover, the majority of the participants partook in the experiment in uncontrolled settings. Many participants in this condition commented on distractions during the task, which could have affected their response time and accuracy. The present research attempted to control for this by excluding participants with low accuracy rates and exceptionally fast response times to ensure data reliability. Finally, the nature of the LDT with words presented without context may have caused verbs to be misrepresented: their grammatical function may be lost without context, potentially confounding our results. Therefore, future research could consider investigating cognate effects within more syntactically embedded contexts, which might trigger cognate effects across word classes under more ecologically valid conditions.

Despite certain limitations, the current findings contribute to the comprehension of the integrated bilingual mental lexicon, where no difference in conceptual features for noun and verb cognates is observed. Moreover, the findings add to the broader field of second language acquisition, particularly in understanding how lexical competition from the L1 influences real-time word recognition in the L2, providing a better understanding of language in cognition and pedagogical insights. Specifically, these insights highlight the challenges bilinguals face when processing cognates especially in mixed-language contexts. Such knowledge can support the development of more effective instructional strategies and assessment tools for bilingual learners in increasingly multilingual educational environments.

6. CONCLUSION

This study investigated the cognate effects in Dutch-English bilinguals when performing an LDT in a mixed-language situation. The results revealed that participants' response times towards cognates were significantly larger compared to non-cognate words, suggesting that cognates impose a negative effect on word recognition in a bilingual context. This study extends the findings supporting cognate inhibition effects in mixed-language conditions and provides further evidence for the non-selective access hypothesis of the bilingual mental lexicon. However, no significant difference was found in the extent of the observed cognate inhibition effect between nouns and verbs. This implies that these word classes may be processed similarly and that their semantic features may overlap to a comparable degree across languages. Additionally, the present study also observed that participants' reaction times decreased as the experiment progressed, indicating a potential learning effect. Although this study extends the findings in the field of the bilingual mental lexicon, there exist limitations with regard to generalisability as well as certain methodological constraints. Further research is needed to explore the cognate effects to a greater extent and on a larger scale. Despite these limitations, the findings of this study offer potential insights into the lexical representations of bilingual populations.

Fortuny, Chen, Ledeboer and van Roij, 2025

ADDITIONAL INFORMATION AND DECLARATIONS

1. The authors all contributed equally to the research and share first authorship.

2. We sincerely thank Dr. Iris Mulders for her supervision and useful commentary on the project.

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Competing interests statement: There are no conflicts of interest.

FOOTNOTES

3. In the present study, the term bilingualism is defined as "the fact of using or being able to speak two languages" (Cambridge University Press, n.d.). This definition is used because the experimental group consists of sequential bilinguals, which are bilinguals who have learned a second language after having already acquired their first language, and therefore fall under the scope of this definition.

4. According to this definition, cognates are different from "false cognates", also known as "interlingual homographs", which are those pairs of words in two languages that resemble each other in form but have unrelated meanings (Brysbaert, 1998; Dijkstra et al., 1998; French & Ohnesorge, 1997; Gerard & Scarborough, 1989). Due to these semantic differences, false cognates are processed differently by bilinguals (Poort & Rodd, 2022). As a result, false cognates are excluded from the scope of the present study.

5. The research was conducted in the context of the course 'Experimental Design and Data Analysis' from Utrecht University. The policy of the Faculty of Humanities at Utrecht University for research with human participants in the context of education is that the teacher ensures the research adheres to ethical standards, which was achieved by obtaining informed consent from the participants.

6. The best fitting model is Model 4 with an added random slope for trial index (see section 4.4.)

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HOW DOES A PERSON'S SECOND LANGUAGE AFFECT THEIR PERSONALITY?

A look into Slavic languages

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ABSTRACT

This study explores the impact of language on personality traits among Slavic first-language (L1) speakers using English as a second language (L2). To investigate whether individuals score differently when using their L1 compared to their L2, a total of 54 participants (speakers of Bulgarian, Russian, Croatian, and Slovenian) completed the Big Five Inventory-2 Short Form (BFI-2-S) in both English and their native Slavic language. To induce a monolingual mode, participants first took the test in English, followed by a video-based language switch to L1 before retaking the test in their native language. Our main focus was on Negative Emotionality, encompassing Anxiety, Depression, and Emotional Volatility, and we predicted that participants would score higher on it when taking the personality test in their L1. However, this difference was not statistically significant ($p = 0.355$). Interestingly, scores for Extraversion and Open-Mindedness were significantly higher in L1, suggesting that personality expression may vary depending on the language of use, potentially influenced by cultural and cognitive factors. These findings add to a growing body of evidence that language not only reflects but may actively shape aspects of individual identity.

Keywords: second language acquisition, Slavic languages, personality and language, multilingualism, Big Five Inventory.
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1. INTRODUCTION

In the field of Second Language Acquisition, it is well-documented that as individuals become proficient in a second language (L2), they begin to internalise it to the extent of thinking in it. This phenomenon, referred to as the cognitive shift (Morgan & Clarke, 2011), is a sign of a high level of proficiency that marks a transition where the L2 is no longer merely translated from the first language (L1), but instead can be learnt more implicitly, processed more automatically and intuitively - much like an L1 (Ortega, 2009). As the L2 becomes integrated into the individual's mental processes, a key question arises: How does using their second language affect users' personality compared to using their first language?

Various sources and emerging research about different languages suggest that people are likely to display different personality traits depending on the language they are speaking - their L1 or L2. Bilingual individuals often report feeling or behaving differently when speaking in their L1 compared to their L2, and studies using personality assessments have shown measurable differences in scores across languages.

That conclusion brings to light many perspectives on language, and its effects on one's personality, however, the methodology differs vastly in experiments, and so far, no Slavic languages had been researched. In this study, the focus will be on English as L2 and its interaction with Slavic languages as L1 in the context of personality change. The methodology will utilise the personality test Big Five Inventory-2 (short version) assessing the levels of individuals' Extraversion, Agreeableness, Conscientiousness, Open-Mindedness, and Negative Emotionality. By targeting an underrepresented linguistic group and applying a controlled methodology designed to induce monolingual modes, this study contributes to the broader understanding of how language and personality interact in multilingual contexts.

2. THEORETICAL BACKGROUND

The connection between personality and language is a multifaceted topic that has been explored in the fields of Education and Teaching, Psychology, Cognitive Science as well as Linguistics. When learners begin to think in a second language, they are not merely translating their thoughts but are instead adopting the cognitive frameworks and cultural contexts embedded within the new language (Benet-Martinez et al., 2002). The paper by Morgan & Clarke (2011) elaborates on a possible cognitive shift, signifying a deeper level of language internalisation. When the shift takes place, the learner starts to view the world from the perspective of the second language. Thereby they integrate new identity aspects and therefore personality, aligned with this language. These experiments highlight the importance of considering proficiency to account for the effect of personality change, which was considered in the methodology of this paper. In the study conducted by Chen and Bond (2010), the theory of personality change is further explored as participants were assigned to assess their own traits in English and Chinese as well as highlight perceived traits of typical native English and Chinese speakers. The results revealed distinct differences in perceived traits between English and Chinese speakers, where participants positioned themselves midway between the two groups in terms of self-ratings. The ratings by observers of the participants also differed based on language and ethnicity, including a nuanced interplay between language, culture, and personality expression. These findings further suggest that language activates cultural norms influencing how personality traits are manifested. The difference in script, cultural norms and overall grammar of the languages can be an underlying reason for that difference, but such a difference is not limited to starkly different languages. Ramírez-Esparza et al. (2006) also investigated the link between language and persahrenonality, but in Spanish-English bilinguals. In their study, the Big Five Inventory was used in Spanish and English to measure participants' personality dimensions, including Neuroticism (which was changed to Negative Emotionality in the latest version of the test). Three groups of Spanish-English bilinguals were tested, and all of them showed lower scores of Neuroticism in English than in Spanish. This inspired us to use the very same personality test, and follow a similar methodology, and in comparison, with Chen and Bond's research (2010) - pushed us to consider another language family for a similar outcome, namely Slavic. Additionally, Pavlenko's research (2006) focuses on personality but specifically investigates whether people perceive a change in themselves when changing languages. The study finds that when people describe their personalities in languages other than their native ones, they often use words that suggest they feel fake, artificial, or like they're putting on an act (Pavlenko, 2006). From the answers given, many find their second language as a medium for the expression of their emotions, offering "new 'clean' words", without the anxieties associated with their native language (Pavlenko, 2006: 20). However, this freedom is also intertwined with nostalgia for the emotional depth of the L1, which nonetheless can both wound and heal (Pavlenko, 2006, p. 20). The link between emotionality and L2 is further elaborated by the variable of the age at which L2 is learned, due to the L1 effects stemming from affective linguistic conditioning in childhood (Pavlenko, 2005 in: Pavlenko, 2006). Pavlenko theorises that languages learned in childhood involve the limbic system and emotional memory. In contrast, those learned later in life may rely to a greater degree on declarative memory and thus produce weak responses and a feeling of detachment, disembodiment, and the perceived 'artificiality' by the participants (Pavlenko, 2006).

Further research also confirms the connection between switching languages and perceiving a personality change. According to the results of a study by Benet-Martinez et al. (2002), people who were not raised

bilingually, but are proficient in two languages reported personality changes when switching between different languages. Moreover, the research of Ahrend & Nicolai (2023) on the relation of language to personality showed similar results. In their experiment, participants had to rate their personality dimensions, such as emotionality, in both languages, and the results suggested that speakers of different languages, including those who were not raised bilingually, perceive a change in personality. This change was also associated with a difference in the level of emotionality, which provides an even stronger backing for that same argument. Another point of consideration in that regard was the monolingual and bilingual mode that a speaker can enter into. The research by Grosjean (2012) delves into the concept of language mode in bilingual individuals, arguing that they switch between monolingual and bilingual communication depending on factors like language proficiency, relationship dynamics, and setting. This concept acts as a significant confounding variable in research, as it can introduce data variability and complicate interpretation and therefore motivated this research to use tools to induce this monolingual mode for both tested languages. The study gave further perspective on the 'mode' that was targeted within our research, and therefore the videos were introduced into the methodology.

All perspectives reveal the complex interplay between language, personality, and emotion, providing a deeper understanding of the psychological impacts of second language acquisition as well as the innateness of 'being' in thinking. The theoretical background has been carefully analysed and utilised within the foundations of the study, as well as main parts of its methodology. The lack of research on Slavic languages within it is also the inspiration for this side of the research. Considering all languages and cultures have vastly different experiences regarding personality and knowledge of the language, we thought it was a needed addition to the field of linguistics.

3. CURRENT STUDY

3.1 Research Question

The current study aims to investigate how a switch between the second (L2) and the first (L1) language shifts speakers' personality traits with a particular focus on Negative Emotionality. The following question is expanded in detail: Do participants score higher in the Negative Emotionality section (Anxiety, Depression, and Emotional Volatility) of the BFI-2-S in their L1, compared to their L2?

3.2 Hypothesis

Building on the insights gained from the literature, this study proposes the following hypothesis: language users will have higher scores in 'Negative Emotionality' while taking the personality test in their first (Slavic) language compared to their scores in English. The null hypothesis is: language users will not have higher scores in 'Negative Emotionality' while taking the personality test in their first (Slavic) language compared to their scores in English. By delving into this topic, our research will contribute to a widely under researched language group, as well as provide more insight into how language shapes personality in Slavic L1 speakers. It will also give insight into the broader picture, with suggestions for further investigation on what aspects of personality are altered in L2 compared to L1.

3.3 Methodology

3.3.1 Participants

The study included participants aged 18-30, who do not have any language-related problems so that they do not affect the results in any way. The focus audience was Slavic (Russian, Croatian, Slovenian, and Bulgarian) first-language speakers. By testing the speakers of different language branches (subgroups) - Eastern South Slavic (Bulgarian), Western South Slavic (Croatian and Slovenian), and East Slavic (Russian), we aimed to represent various L1 speakers within the Slavic group. The choice of languages reflects the researchers' language proficiency and the lack of research done within that language group. Additionally, all of the participants speak English at an upper-intermediate (B2) level or higher and have not been raised bilingually with it. Different questionnaires were sent to the participants, depending on their L1. The participants were recruited through the researchers' friends, family, and acquaintances.

A total of 21 participants were recruited for the Russian survey, 27 for Bulgarian, 6 for Croatian, and 4 for the Slovenian one. Out of the participants, 3 Bulgarian participants as well as 1 Russian were excluded, due to not completing the survey properly, as their results showed that they did not follow instructions in the second part of the survey where they were asked to watch a video in their native language and answer related questions. Finally, a total of 54 participants' data were used for the analysis.

3.3.2 Ethics

The research was conducted with the guidance of our supervisor, Owen Kapelle, strictly following the guidelines of the Ethics Committee of the Faculty of Humanities. All participation was completely voluntary, and an Information brochure was given prior to participation (Appendix A). All participants were at least 18 years of age, and an Informed consent form (Appendix B) in the beginning of the questionnaire was given, which they also had to confirm. No manipulation, or misleading tactics were used, and all data was anonymous with no personal or sensitive information processed.

3.3.3 Big Five Inventory

Within the current study, the participants had to complete a survey based on the BFI-2-S personality test. Big Five Inventory-2 (BFI-2; Soto & John, 2017) assesses the Big Five domains: Extraversion, Agreeableness, Conscientiousness, Open-Mindedness, and Negative Emotionality (with facets of Anxiety, Depression, and Emotional Volatility). BFI-2-S, the short form of BFI-2 was developed for situations where measures may be needed to prevent participant fatigue, frustration and careless responding as well as different circumstances in which researchers are assessing multiple different factors and require a more concise questionnaire. After researching its accuracy, compared to the more detailed one, it was concluded that it retains much of the full BFI-2's domain-level validity, but not as much of the facet-level (Soto & John, 2017). Soto and John concluded that the BFI-2-S should not be used to examine the facets in smaller samples of participants. In this research, the participants had to complete the personality test twice, as they decided to use the short form of it. Thereafter, in this research, conclusions for the facets were not drawn.

3.3.4 Procedure

At the beginning, the information brochure (see Appendix A) and the consent form (see Appendix B) were shown to the participants, and their consent to participate was asked. In addition, they were asked to complete the survey continuously, without interruptions, and to confirm that their age is 18-30 as well as that their first language is the one that the questionnaire contains (Russian/Croatian/Slovenian/Bulgarian depending on the participant). They were also asked whether their approximate English language is C2 (Proficiency), C1 (Advanced), or B2 (Upper-intermediate).

Then the participants completed the survey in Qualtrics, based on the BFI-2-S personality test. The Qualtrics survey consisted of three parts. Firstly, there was a personality test in English. As all the information and instructions at the beginning were in English, the order of the surveys began with 30 questions of the BFI-2-S personality test in English for consistency and language switch induction to the participants' L2. It included six questions measuring Negative Emotionality which was the focus of the research. For each question, the participants were asked to choose to what extent they agreed or disagreed with the statement. The extent of agreement or disagreement varied from 1 to 5 with the numbers corresponding to the following statements: 1 - Disagree strongly, 2 - Disagree a little, 3 - Neutral; no opinion, 4 - Agree a little, 5 - Agree strongly. The instructions for this section were the following: "Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a number next to each statement to indicate the extent to which you agree or disagree with that statement." Some wordings of the original test questions were adjusted slightly to correspond to the upper-intermediate (B2) level of proficiency in English, having made sure that the original semantics of the phrases were lost neither in English nor in other languages. The full questionnaire in English is presented in Appendix C.

Secondly, language switch induction was conducted. The participants watched a short (approximately four-minute) video in their first language, so they started using their first Slavic language instead of English. To ensure a better effect, they answered five multiple-choice questions in their first language related to the content of the video. The videos and questions asked can be seen in Appendix H for each language respectively.

Lastly, there was a personality test in their first language. The participants answered the same 30 questions of the BFI-2-S personality test but entirely in their first language. The questions were translated accurately into the participants' first languages by the

researchers. Similarly to the first part, six questions connected with Negative Emotionality fell under the research's specific interest. The stimuli looked the same, with all the inscriptions translated into the participant's first language. There were four Qualtrics surveys, each containing the second and third parts in one of the four Slavic languages in question. The full questionnaires in Bulgarian, Russian, Slovenian and Croatian are presented in Appendices D-G, respectively.

4. RESULTS

4.1 Negative Emotionality

Participant data were analysed to compare Negative Emotionality scale scores between the English and first-language test results. First, each participant's Negative Emotionality scores were measured. These measurements were based on the scoring provided with the BFI-2-S. It concerned the average score of six questions from the personality test (4, 9, 14, 19, 24, 29 (see Appendix C)), three of them (14, 19, 24) being reverse-keyed (Soto & John, 2017). Then the mean and the standard deviation of the Negative Emotionality scores obtained by the participants in their first Slavic language and in English were calculated. To test the hypothesis, we compared these means and, using a paired sample t-test, calculated the p-value to observe whether the difference was statistically significant. The one-tail p-value was used since the hypothesis clearly stated the predicted direction of the difference.

The results showed that on average, the participants scored 0.02 higher on Negative Emotionality while taking the personality test in English, compared to their first Slavic language, the mean scores being 3.19 and 3.17, respectively. Since it was assumed that the participants would score higher on Negative Emotionality in their first Slavic language and the results showed the opposite, they did not provide evidence to support the hypothesis. The one-tail p-value, measured using a paired sample t-test, was 0.355, so, considering the data observed in this study, the chance that we reject the null hypothesis wrongfully is higher than 35%. Thus, this difference in the means cannot be considered meaningful and applicable to the larger population. Therefore, the findings regarding the influence of language on Negative Emotionality are inconclusive. Table 1 presents the results of the paired two sample t-test for Negative Emotionality means.

4.2 Extraversion, Agreeableness, Conscientiousness and Open-Mindedness

As the participants were being tested on all Big Five domain scales, the other dimensions' test results were analysed as well to see whether they contained any meaningful data. Each participant's scores in Extraversion, Agreeableness, Conscientiousness, and Open-Mindedness were calculated the same way as Negative Emotionality, and the means and standard deviations were measured.

To observe whether the difference in means was statistically significant, we used a paired sample t-test and measured two-tail p-value as we did not

Table 1

t-test: paired two sample for means (negative emotionality)

Test language	English	Slavic L1
Mean	3,19	3,17
Variance	0,68	0,81
Observations	54	54
Pearson correlation	0,88	0,88
Hypothesised mean difference	0	0
df	53	53
t stat	0,37	0,37
P(T<=t) one-tail	0,36	0,36

have any specific predictions on the direction of difference between the means. Table 2 presents the results of these t-tests for Extraversion, Agreeableness, Conscientiousness, and Open-Mindedness mean scores. As can be seen from the table, *p*-values in the t-tests on Extraversion and Open-Mindedness are less than 0.05 (0.0498 and 0.0016, respectively) which makes it possible to consider them statistically significant. The statistically significant results showed that on average, the participants scored lower in Extraversion and Open-Mindedness while taking the test in their second language (English) compared to their first (Slavic) language.

5. DISCUSSION

This study aimed to investigate the influence of how using English as a second language affects users' personality, specifically Negative Emotionality (one of the BFI-2-S personality test dimensions with facets of Anxiety, Depression, and Emotional Volatility (Soto & John, 2017)), compared to using their first (Slavic) language. It was predicted that participants would score higher on Negative Emotionality in their native language than in English. Unexpectedly, the study showed that participants got slightly higher scores in Negative Emotionality in English. However, this difference was not statistically significant (p = 0.355), implying that the observed difference may be due to chance rather than a direct impact of language on Negative Emotionality. The observed emotional detachment in L2 use might explain non-significant Negative Emotionality high scores in English. According to the research by Pavlenko (2006), people who learn a second language later in life frequently experience a sense of detachment or artificiality when using it. Thus, when participants had higher Negative Emotionality scores in L2 than in L1, they might feel less emotionally attached to it, influencing such scores.

Further investigation of the other Big Five dimensions (Extroversion, Agreeableness, Conscientiousness, and Open-Mindedness) showed interesting patterns. Participants scored lower on all of these aspects in their L1 than in their L2. However, only the results for Extraversion and Open-Mindedness have statistically significant differences between the two languages, with *p*-values of 0.0498 and 0.0016, respectively. As mentioned in the literature review, languages learnt in childhood involve emotional memory, while languages acquired later in life rely more on declarative memory, resulting in weaker personal attachment (Pavlenko, 2006). Extraversion and Open-Mindedness are linked with how we interact with the world and see it, and,

Table 2

t-test: paired two sample for means (extraversion, agreeableness, conscientiousness and open-mindedness)

Dimension	Extraversion		Agreeableness		Conscientiousness		Open-mindedness	
Test language	English	Slavic L1	English	Slavic L1	English	Slavic L1	English	Slavic L1
Mean	3,16	3,25	3,46	3,54	3,27	3,32	3,94	4,12
Variance	0,64	0,56	0,52	0,49	0,58	0,63	0,43	0,47
	54	54	54	54	54	54	54	54
Pearson correlation	0,92	0,92	0,92	0,92	0,93	0,93	0,82	0,82
df	53	53	53	53	53	53	53	53
t stat	-2,01	-2,01	-1,87	-1,87	-1,16	-1,16	-3,32	-3,32
P(T<=t) two-tail	0,0498	0,0498	0,0667	0,0667	0,2523	0,2523	0,0016	0,0016

since both dimensions have higher scores in the participant's L1, Pavlenko's statement coincides with our observations: a second language has a weaker personal and psychological bond. Although the questionnaire did not inquire on the time a language was learnt, not being raised bilingually with English was a factor we considered with participants, therefore it is possible to assume their L2 was learned later, after childhood, further linking our results to Pavlenko's.

These findings of personality change align with previous studies stating that while switching languages, individuals might have different personality traits, possibly due to cultural frame shifts (Benet-Martinez et al., 2002). As Slavic culture is quite different from English, it is expected to see differences within an individual's personality when using a different language with a strong cultural influence, as was noticed among Chinese-English speakers (Chen & Bond, 2010) and Spanish-English bilinguals (Ramírez-Esparza et al., 2006). Although self-perception was not investigated, the observations regarding Open-Mindedness and Extraversion were in alignment with previous research.

5.1 Limitations

An attempt to induce a monolingual mode through language-specific video stimuli in the second part, despite having a great literature base (Grosjean, 2012), faced most major limitations. The videos that were used in the second part were not sad or depressing and could have affected the participants' emotional state, potentially affecting their responses. Thus, in future research, more emotionally neutral materials may be used to make people start using a different language. Additionally, several participants reported that in the third part of the survey, they started to recall what they had answered in the first part, regardless of the language switch. A solution might be to counterbalance the recall effect by varying the order of L1 and L2 parts of the survey between two halves of participants. Moreover, taking different language tests on separate days could help address this issue, although it might reduce anonymity. As a result, the methodology of this study is limited by the use of online surveys rather than in-person interviews, which may benefit this study's accuracy more.

Furthermore, future research could include self-assessment in the survey to draw participant attention directly to the connection between their languages and personality and investigate whether the connection between negative emotionality and language arises when self-reflecting. It was used in many of the background studies (Chen & Bond, 2010; Pavlenko, 2006; Benet-Martinez et al., 2002) but was removed from the current study procedure to avoid the participants' fatigue.

With that said, further research is essential to gain a better understanding of language usage and personality relations, especially in understudied populations like Slavic language users. For instance, expanding the sample size, employing more diverse methodologies, and exploring additional personality dimensions could provide clearer insights into this complicated topic.

6. CONCLUSION

This study did not find strong evidence to support the hypothesis that participants would score higher in Negative Emotionality in their first language as the received data were not statistically significant. However, it did reveal differences in other personality dimensions, Open-Mindedness and Extraversion, when switching languages. These findings show a connection between language and personality, despite the limitations that occurred in our research.

The research itself contributes to the ongoing discourse on language and personality by highlighting the nuances and potential inconsistencies in how different languages influence individuals' personalities. The context in which the second language is used, for instance, online, in public, or at home, can influence emotional and personality expression. The online survey of the personality test might not fully capture the dynamics and slight differences in which language affects language users' personalities in everyday situations. Thus, this question could also be studied in the future.

Moreover, with this topic, especially with Slavic languages, lacking sufficient research, this study sheds light on this under-researched topic of Linguistics, more specifically on Language Acquisition, Sociolinguistics, and Psycholinguistics. Additionally, more insights into how language affects personality can improve our understanding of bilingualism, cognitive processes, and the cultural influence of language use. Ultimately, while the answer to our research question remains unanswered and, despite the limitations of our study, statistically significant data in other personality dimensions warrant further exploration, by learning more about these complicated relationships, we may gain a deeper grasp of how language impacts our identity.

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APPENDIX A

Information brochure for the First Year Group Project in BA Linguistics

Dear participant,
You will be taking part in a study, performed under the supervision of Kapelle O. in the context of the First Year Group Project of the Bachelor Programme in Linguistics at the University of Amsterdam. Before the study can begin, it is important that you read about the procedures we will be applying. Make sure to read this brochure carefully.

Purpose of the research project

We aim to investigate speakers' personalities. At this stage of the study, we cannot provide any further information on the factors we will be examining. If you wish to receive further details after the experiment has ended, you can email one of us.

Who can take part in this research

We are inviting adult first-language speakers of one Slavic language to take part in this research. During this questionnaire, you will be asked to answer personality questions in English, thus making knowledge of English essential for participation. Additionally, you will be asked to watch a short video clip in your first language, so a good hearing environment must be achieved.
You can participate in this research project if Russian, Croatian, Bulgarian, or Slovenian is your first language and you know English at an intermediate or advanced level and weren't raised knowing it from birth. We also need to make sure that you do not – to the best of your knowledge — have any language problems such as dyslexia or a specific language disorder.

Instructions and procedure

In the very beginning, we will ask for your consent to collect and analyse your data, after that, you will be asked some background questions about your first language, age, and English proficiency.
During the first part of the Qualtrics survey, you will answer 30 questions in English, about your personality, and it will take around 5 minutes.
During the second part of the survey, you will watch a short video. After that, you will answer several questions related to the content of it, and some more questions about your personality. This part will take around 10 minutes.
Overall, the survey will take between 15-20 minutes of your time.

Voluntary participation

You will be participating in this research project voluntarily. This means you are free to stop taking part at any stage. This will not have any personal consequences, and you will not be obliged to finish the procedures described above. You can always decide to withdraw your participation after the research has ended. If you decide to stop or withdraw your consent, all the information gathered up until then will be permanently deleted. Please note that deletion is only possible until after use of the data or after anonymization because we store personal details separately from the data and cannot tell which data belongs to which participant.

Discomfort, Risks & Insurance

The risks of participating in this research are no greater than in everyday situations at home. Previous experience in similar research has shown that no or hardly any discomfort is to be expected for participants. For all research at the University of Amsterdam, a standard liability insurance applies.

Confidential treatment of your details

The information gathered over the course of this study will be used only for the First Year Group Project in June. Your personal details will not be used in the resulting papers, and we guarantee that you will remain anonymous under all circumstances.

The data gathered during the research will be encrypted and stored separately from your personal details. These personal details and the encryption key are only accessible to the researching students.

Further information

For further information on the research project, please contact:
Selin Stefanova (email: selin.stefanova@student.uva.nl),
Katja Keržan (email: katja.kerzan@student.uva.nl),
Alisa Mitrofanova (email: alisa.mitrofanova@student.uva.nl),
Max Jevdokimovs (email: max.jevdokimovs@student.uva.nl), or
Owen Kapelle (email: o.e.j.kapelle@uva.nl; Spuistraat 134, 1012VB Amsterdam).

If you have any complaints regarding this research project, you can contact the secretary of the Ethics Committee of the Faculty of Humanities of the University of Amsterdam, commissie-ethiek-fgw@uva.nl, phone number: +31 20 - 525 3054; Kloveniersburgwal 48, 1012 CX Amsterdam.

APPENDIX B
Informed consent form

'I hereby declare that I have been clearly informed about the study, performed under the supervision of Kapelle O. in the context of the First Year Group Project of the Bachelor Programme in Linguistics at the University of Amsterdam as described in the information brochure. My questions have been answered to my satisfaction.

I consent to participate in this research on an entirely voluntary basis. I retain the right to revoke this consent without having to provide any reasons for my decision. I am aware that I am entitled to discontinue the research at any time and can withdraw my participation after the research has ended. If I decide to stop or withdraw my consent, all the information gathered up until then will be permanently deleted. I am aware that deletion is only possible until after the use of the data or after anonymization.

If my research results are used in student papers or made public in any other way, they will be fully anonymised. My personal information may not be viewed by third parties without my express permission. My data will be deleted as soon as they are no longer needed for the paper.

If I need any further information on the research, now or in the future, I can contact:
Selin Stefanova (email: selin.stefanova@student.uva.nl),
Katja Keržan (email: katja.kerzan@student.uva.nl),
Alisa Mitrofanova (email: alisa.mitrofanova@student.uva.nl),
Max Jevdokimovs (email: max.jevdokimovs@student.uva.nl), or
Owen Kapelle (email: o.e.j.kapelle@uva.nl; Spuistraat 134, 1012VB Amsterdam).

If I have any complaints regarding this research, I can contact the secretary of the Ethics Committee of the Faculty of Humanities of the University of Amsterdam; email: commissie-ethiek-fgw@uva.nl; phone number: +31 20 - 525 3054; Kloveniersburgwal 48, 1012 CX Amsterdam.
I hereby consent to participate in this research, being able to withdraw my details if wanted, and my data to be stored for June 2024.

APPENDIX C

Personality Test Questions (in English)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a number next to each statement to indicate the extent to which you agree or disagree with that statment.

I am someone who…

Disagree strongly

Disagree a little

Neutral; no opinion

Agree a little

Agree strongly

1. Tends to be quiet.
2. Is empathetic, has a soft heart.
3. Tends to be disorganized.
4. Worries a lot.
5. Is fascinated by art, music, or literature.
6. Is dominant, acts as a leader.
7. Is sometimes rude to others.
8. Has difficulty getting started on tasks.
9. Tends to feel depressed, blue.
10. Has little interest in abstract ideas.
11. Is full of energy.
12. Assumes the best about people.
13. Is reliable, can always be counted on.
14. Is emotionally stable, not easily upset.
15. Is original, comes up with new ideas.
16. Is outgoing, sociable.
17. Can be cold and uncaring.
18. Keeps things neat and tidy.
19. Is relaxed, handles stress well.
20. Has few artistic interests.
21. Prefers to have others take responsibility.
22. Is respectful, treats others with respect.
23. Is determined, works until the task is finished.
24. Feels secure, comfortable with self.
25. Is complex, a deep thinker.
26. Is less active than other people.
27. Tends to find fault with others.
28. Can be somewhat careless.
29. Is temperamental, gets emotional easily.
30. Has little creativity.

APPENDIX D

Personality Test Questions (in Bulgarian)

Имаме даден брой характеристики, които може да се или да не се отнасят за вас. Примерно, 'Съгласен ли си, че си човек, който харесва да прекарва време с другите?' Моля изберете число под всяко твърдение за да посочите до колко сте съгласни или несъгласни с твърдението.

Аз съм човек, който…

Напълно несъгласен

Малко несъгласен

Неутрален; нямам мнение по въпроса

Малко съгласен

Напълно съгласен

1. Често е тих.
2. Е състрадателен, има добро сърце.
3. Е често неорганизиран.
4. Доста се притеснява.
5. Се очарова от изкуство, музика или литература.
6. Е доминантен, държи се като лидер.
7. Понякога е груб с другите.
8. Му е трудно да се захване със задачи.
9. Има наклонност да се чувства депресиран.
10. Не се интересува особено от абстрактни идеи.
11. Е пълен с енергия.
12. Предполага най-доброто за хората.
13. Е надежден, винаги може да му се разчита.
14. Е стабилен емоционално, не се смущава лесно.
15. Е оригинален, измисля нови идеи.
16. Е дружелюбен, общителен човек.
17. Може да е студен и безразличен.
18. Държи нещата чисти и подредени.
19. Е спокоен, доста държи на стрес.
20. Има малко артистични интереси.
21. Предпочита другите да поемат отговорности.
22. Уважителен е, държи се към другите с респект.
23. Е решителен, работи докато задачата е приключена.
24. Се чувства сигурен, комфортен със собственото си аз.
25. Е сложна личност, мисли дълбоко.
26. Е по-малко активен, в сравнение с други хора.
27. Има тенденция да търси вината в другите.
28. Случва се да е небрежен.
29. Е темпераментен, разчувства се лесно.
30. Има малко креативност.

APPENDIX E

Personality Test Questions (in Russian)

Ниже приведен список качеств, которые могут Вас характеризовать или не характеризовать. Например, Вы согласны с тем, что Вы – человек, которому нравится проводить время с другими людьми? Пожалуйста, выберите одно число от 1 до 5 рядом с каждым утверждением, чтобы обозначить степень Вашего согласия или несогласия.

Я – человек, который…

Совершенно не согласен(-на)

Немного не согласен(-на)

Нейтрально; нет мнения

Немного согласен

Совершенно согласен

1. Склонен быть молчаливым.
2. Сопереживающий и добросердечный.
3. Склонен быть неорганизованным.
4. Часто переживает.
5. Увлечен живописью, музыкой или литературой.
6. Доминирует, ведет себя как лидер.
7. Порой бывает груб с окружающими.
8. С трудом приступает к работе.
9. Склонен к печали, депрессии.
10. Мало интересуется абстрактными идеями.
11. Полон энергии.
12. Видит в людях только хорошее.
13. Надежен, на которого всегда можно рассчитывать.
14. Эмоционально стабилен, которого нелегко расстроить.
15. Генерирует новые идеи, оригинально мыслит.
16. Общителен, открыт.
17. Может быть холодным и равнодушным.
18. Держит вещи в чистоте и порядке.
19. Расслаблен, хорошо справляется со стрессом.
20. Мало интересуется искусством.
21. Предпочитает, чтобы ответственность брали другие.
22. Относится к другим людям с уважением.
23. Настойчив, доводит дело до конца.
24. Чувствует себя в безопасности, комфортно с самим собой.
25. Сложный, глубокомыслящий.
26. Менее активный, чем остальные.
27. Склонен искать ошибки в поступках других людей.
28. Бывает беспечным/легкомысленным.
29. Темпераментный, легко впадает в эмоции.
30. Имеет мало творческих способностей.

APPENDIX F

Personality Test Questions (in Slovenian)

Navedenih je nekaj značilnosti, ki lahko veljajo za vas. Na primer, ali se strinjate, da ste nekdo, ki rad preživlja čas z drugimi? Izberite odgovor poleg vsake izjave, da označite v kolikšni meri se strinjate ali ne strinjate z izjavo.

Sem oseba ki…

Se ne strinjam

Nekoliko se ne strinjam

Nevtralno; nimam mnenja

Nekoliko se strinjam

Se strinjam

1. Je ponavadi tiho.
2. Je sočutna, ima mehko srce.
3. Je nagnjena k neorganiziranosti.
4. Jo veliko skrbi.
5. Se navdušuje nad umetnostjo, glasbo ali literaturo.
6. Je dominantna, deluje kot vodja.
7. Je včasih nesramna do drugih.
8. Se težko loti nalog.
9. Se ponavadi počuti depresivno.
10. Se ne zanima za abstraktne ideje.
11. Je polna energije.
12. Si o ljudeh predpostavlja najboljše.
13. Je zanesljiva, na katero se lahko vedno zaneseš.
14. Je čustveno stabilna, ni zlahka razburjena.
15. Je originalna, polna novih idej.
16. Je odprta, družabna.
17. Je lahko hladna in malomarna.
18. Ohranja stvari čiste in pospravljene.
19. Je sproščena, dobro prenaša stres.
20. Nima veliko umetniškega zanimanja.
21. Ima raje, da drugi prevzamejo odgovornost.
22. Je spoštljiva, do drugih ravna spoštljivo.
23. Je vztrajna; dela, dokler naloga ni končana.
24. Se počuti varno, udobno sama s seboj
25. Je kompleksna, globoko misli.
26. Je manj aktivna kot drugi.
27. Rada išče napake pri drugih.
28. Je lahko nekoliko neprevidna.

29. Je temperamentna, zlahka postane čustvena.
30. Ni zelo kreativna.

APPENDIX G

Personality Test Questions (in Croatian)

Evo nekih karakteristika koje se mogu, ali i ne moraju odnositi na vas. Na primjer, slažete li se da ste netko tko voli provoditi vrijeme sa drugima? Odaberite broj svake izjave kako biste označili u kojoj se mjeri slažete ili ne slažete s tom izjavom.

Sam osoba koja...

Ne slažem se

Donekle se ne slažem

Neutralan; nemam mišljenje

Donekle se slažem

Slažem se

1. Je obično tiha.
2. Je suosjećajna, ima meko srce.
3. Je sklona biti neorganizirana.
4. Se jako brine.
5. Je strastvena prema umjetnosti, glazbi ili književnosti.
6. Je dominantna, ponaša se kao vođa.
7. Je ponekad gruba prema drugima.
8. Se teško nosi sa zadacima.
9. Se obično osjeća depresivno.
10. Ne zanimaju apstraktne ideje.
11. Je puna energije.
12. O ljudima zamišlja sve najbolje.
13. Je pouzdana, na koju se uvijek možete osloniti.
14. Je emocionalno stabilna, ne uzrujavam se lako.
15. Je originalna, puna novih ideja.
16. Je otvorena, društvena.
17. Zna biti hladna i nemarna.
18. Održava stvari čistima i urednima.
19. Je opuštena, dobro podnosim stres.
20. Nema veliki umjetnički interes.
21. Više voli da drugi preuzimaju odgovornost.
22. Je puna poštovanja, prema drugima se odnosim s poštovanjem.
23. Je uporna; radi dok se zadatak ne završi.
24. Se osjeća sigurno, ugodno sama sa sobom.
25. Je kompleksna, duboko razmišlja.
26. Je manje aktivna od drugih.
27. Voli tražiti greške drugima.
28. Zna biti pomalo nemarna.
29. Je temperamentna, lako se emocionaliziram.
30. Ni baš kreativna.

APPENDIX H

Language switch induction

Bulgarian

The participants had to watch the popular bulgarian youtuber Tsvetoslav Tsonev's video (Tsvetoslav Tsonev, 2018) and answer the following questions with one of the answers below:

1. За какво става въпрос?
- Реклама за Нутрибулет
- Видео на ютубърът Цуро
- Реклама за здравословно хранене
2. Какво е НутриМутри? Прясно истискани сокове от...
- мутри
- бабаити
- батки
3. Как се реже морков?
- Като жената във видеото
- Не като жената във видеото
- Като мъжа от видеото
4. Къде хвърлят чипса?
- В кош
- По хората
- Не го хвърлят
5. Как се казва бабата на колелото?
- Пенка
- Пепа
- Петя

Russian

The participants had to watch a video from a popular Russian channel for comedic skits (Киножурнал Ералаш, 2015) and answer the following questions with one of the answers below:

1. Как звали учителя литературы?
- Валерий Евгеньевич
- Валерий Иванович
- Виталий Андреевич
- Фамилия рассказчика
- Хазанов
- Хасанов
- Хазаров
2. В каком году родился А.С.Пушкин?
- 1799
- 1798
- 1797
3. Из какой поэмы стихотворение "У лукоморья дуб зелёный..."?
- "Руслан и Людмила"
- "Кавказский пленник"
- "Медный всадник"
4. По какому предмету заболела учительница?
- Ботаника
- Биология
- Обществоведение

Slovenian

The participants had to watch a humorous advertisement from a Slovenian supermarket chain (HOFER Slovenija, 2022) and answer the following questions with one of the answers below:

1. Kakšen video ste si ogledali?
- Reklamo za Hofer
- Reklamo za Mercator
- Dokumentarni video.
2. Kje spi dedi?
- V postelji.
- Na supu.
- Na kavču.
3. Kakšna cena je omenjena v videu?
- Akcijska cena.
- Hofer cena.
- Sveža cena.
4. Kateri žanr glasbe v videu vam je ljubši?
- Opera.
- Narodnozabavna.
- Rock.
5. Kdo je izvajalec v videu?
- Lokalni delavec v Hoferju.
- Lado Bizovičar.
- Bivši predsednik Borut Pahor.

Croatian

The participants had to watch a video of a popular Croatian musician (Hrvatska radiotelevizija, 2024) and answer the following questions with one of the answers below:

1. Tko je u videu?
- Baby Lasagna
- Baby Spaghetti
- Baby Pizza
2. Kako jim je govorila šefica?
- Pjevala im je.
- Kao da je nitko nije slušao.
- Kot da je mačke prizivala.
3. Koji grad je u videu?
- Zagreb
- Umag
- Split
4. Što radi Marko u videu?
- Radi krevet.
- Kuha večeru.
- Pjeva.
5. Što radi Marko kad ne pjeva?
- Pravi lazanje.
- Radi kao sobarica.
- Ništa, on samo pjeva.

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SE LOS DIJE:

AN ANOMALOUS PATTERN OF CLITIC AGREEMENT IN DIALECTAL SPANISH

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ABSTRACT

Clitic systems in Spanish are known for their variation, especially in dialectal contexts. Although previous studies have examined sociolinguistic and pragmatic factors, syntactic aspects have received less attention. This paper dives into an intriguing construction found in many Spanish dialects: *Se los dije* ('I told it to them'), where the accusative clitic *los* reflects plural agreement with the indirect object (IO), despite its syntactic connection to the singular direct object (DO). Traditional explanations have stated that speakers add plural marking to *los* in an effort to keep track of the referent of the dative pronoun because the invariable dative se cannot overtly express number. This paper proposes a novel syntactic analysis rooted in Chomsky's *Agree* framework (2000, 2001). It suggests that the *v*-bundle as a unit probes for features, first targeting gender from the closest DP, the DO and then continuing its search for a marked plural feature. If no plural goal is located, default singular features surface. The features are then copied in *los* because it is the only element that can carry them. .

Keywords: clitics, agreement, Agree, variation, *se*, Spanish.
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1. INTRODUCTION

Dialectal studies have traditionally paid a lot of attention to the great variation that can be found in the Spanish clitic system. Most of the research has focused on the sociolinguistic, pragmatic and semantic values of these phenomena (Montes Giraldo, 2002; Garita Hernández, 1999; Hoff & Schwenter, 2021 among others) but a lot of syntactic work still needs to be done. The aim of this paper is to present an adequate syntactic analysis for the clitic agreement pattern that can be seen in a construction such as *Se los dije* 'I said it to you guys', namely, that little *v* contains a *v*-bundle that probes for gender and specifically plural number. The features copied are reflected in the second clitic in the phonological form (PF) because it is the only element able to carry them. In order to understand the peculiarity of this structure I will start by briefly looking at the way in which the Spanish clitic system works.

Even though Spanish has lost the case system that characterized Latin, like most of the Romance languages, there is still a remainder of it in pronouns, and therefore also in clitics. Two types of clitics based on case can be

found, dative and accusative clitics. As shown in Table 1 they share a form in the 1st and 2nd persons, but they are different in the 3rd person. The 3rd person pronouns can also be used as 2nd person clitics when the formal 'you' subject, *usted*, is selected.

Table 1
The standard Spanish clitic system

Accusative	Dative
Me	Me
Te (Lo/La)	Te (Le)
Lo/La	**Le**
Nos	Nos
Os (Los/Las)	Os (Les)
Los/Las	**Les**

As reflected above, only 3rd person accusative clitics agree in gender, using *lo* and *los* for masculine and *la* and *las* for feminine. To understand the phenomenon presented in this article it is necessary to note that when two 3rd person clitics happen together, one accusative and one dative, the latter one changes its form from *le* or *les* to se. We can see this in (1). It is important to keep in mind that this *se* is invariable for number, as reflected in the several possible translations for (1b).

(1) a. **Le* *lo* *compré.*
CL.DAT.3SG CL.ACC.3SG.M buy.1SG
'I bought it for him/her'.
b. *Se* *lo* *compré.*
CL.DAT.3 CL.ACC.3SG.M buy.1SG
'I bought it for him/her/them.'

1.1 The relevant construction

The construction that will be analysed in the present article, given in (2a), shows an agreement pattern that differs from what has just been stated. What would be expected is presented in (2b), the structure found in standard Spanish. In (2a) we can see that the accusative clitic *los* is plural when the referent of the direct object (DO) is singular and that of the indirect object (IO) is plural. The full DPs are presented in brackets in (2a) and (2b) to reflect optionality as clitics can be accompanied by the DPs with which they share reference or by themselves. This unexpected number agreement with the IO can take place while there is a visible gender agreement in the same particle with the DO, as reflected in (2c). This gender agreement must also happen in (2a), but we cannot see it because both DPs are masculine. An existing variation of the construction is presented in (2d), an example taken from Sánchez Doreste (2008). Here, the anomalous agreement can be identified with gender in addition to number, but Sánchez Doreste (2008) admits that it is a less common occurrence. The patterns shown in 2 (a-d) seem to only emerge when both clitics are 3rd person, probably because of the presence of se (the key role of se will be discussed in the next section). Taking all the structures exemplified in (2) into account, the aim in the following section will be to try to find a proposal that can explain what operations are forming them.

(2) a. ***Se*** ***los*** *dije*
CL.DAT.3 CL.ACC.3PL.M say.1SG.PST
(a ellos) *(el mensaje).*
to them.M.PL the message.M.SG
'I told them the message.'
b. ***Se*** ***lo*** *dije*
CL.DAT.3 CL.ACC.3SG.M say.1SG.PST
(a ellos) (el mensaje).
to them.M.PL the message.M.SG
'I told them the message.'
c. *La premisa* *ya* ***se***
The premise.F.SG already CL.DAT.3
las *conté.*
CL.ACC.3PL.F tell.1SG
'I already told you guys about the premise.'[1]
d. ***Se*** ***la*** *tiré* *a una*
CL.DAT.3 CL.ACC.3SG.F throw.1SG.PST to one.F.SG
de mis amigas.
OF MY FRIENDS
Un huevo con pintura
a egg.SG.M with paint.
'I threw it to one of my friends. An egg with paint.'

It is important to note that these patterns of agreement can be found in many dialects across the Spanish-speaking world. Traditionally, it has been considered a distinctive feature of American Spanish, but it has also been reported in Europe, as shown in Sánchez Doreste (2008). As attested by (3) we can even find this agreement in Peninsular Spanish leísta dialects in which the accusative masculine clitic is also *le*. The phenomenon has been reported at least in varieties of Spanish in the following areas: Mexico in Moreno de Alba (2013); Puerto Rico in Alemán (2000); Perú in Rivarola (1985); Spain in Sánchez Doreste (2008) and Argentina, Uruguay, Chile, Bolivia, Ecuador, Colombia, Venezuela, Panamá, Costa Rica, El Salvador, Guatemala, Cuba and New Mexico in Kany (1951).

(3) *Eso* ***se*** ***les*** *he dicho*
That CL.DAT.3 CL.ACC.3PL.M say.1SG.PERF
a todos. [2]
to everyone.M.PL
'I have told them all that.'

1.2 Previous proposals

1.2.1 Traditional approach

The traditional approach to this anomalous pattern of agreement, shown in (2a), as DeMello (1992) explains, is that the plurality of the IO is reflected in the accusative clitic because *se* cannot indicate number. Speakers would therefore add the -s in an effort to keep track of the referent of the dative pronoun. Of course, the agreement with the IO would sacrifice the reference tracking of the DO but this is plausible if we think that, as Moreno de Alba (2013) states, indirect objects tend to have a +human referent and therefore saliency over the DO, at least in certain cases. It is also important to notice that *se* is a particle that has a role in other structures such as passives or impersonal sentences. Due to this, it has been claimed that speakers do not actually have the perception of it having any relation with the indirect object (Moreno de Alba, 2013).

Some researchers have argued against this need of tracking the referent of the dative clitic as it does not explain the reality of the phenomenon in some respects. In this regard, it has been shown that the construction has a higher frequency when the plural DP is overtly in the sentence and therefore the number ambiguity does not hinder the interpretation of the IO (Sánchez Doreste, 2008).

1.2.2 Se los as a morphological unit

DeMello (1992), Sánchez Doreste (2008), Company (1998) and Hoff & Schwenter (2021) among others propose that in these dialectal structures, *se los* is one morphological unit that only contains the dative reference and the *-s* morpheme is, therefore, not attached to an accusative clitic even though it might look like it. Company (2001) bases this argument on the fact that Spanish is a dative prominent language and thus tends to reinforce dative case marking at the expense of accusative case marking. She considers that historically whenever a dative argument has had to compete with an accusative one (e.g. clitic duplication, prepositional marking, causative constructions) the dative one has prevailed. For the author this indicates that the distinction between datives and accusatives in Spanish is no longer a clear one.

Even though this hypothesis might seem attractive initially, there are a couple of issues with it that should not be overlooked. First, if we say that *se los* has become one unit with the dative case only, we would be implying that, as Moreno de Alba (2013) points out, *se los* is equivalent to *les*, the dative clitic when there is no accusative pronoun. However, for speakers of these dialects there seems to be a clear semantic difference between the two and they do not accept them in the same contexts. Besides this argument, there is some data that cannot be explained if we accept that *se los* has lost its original accusative case to become purely dative. It is the case of (2c), repeated below, and (4). What we see in these examples is that *las* must necessarily be marking the plurality of the IO referent and the feminine gender of the DO. To the best of my knowledge, these structures in which *las* clearly agrees in number with the IO and in gender with the DO have not been considered in most of the previous work, but they can give us very useful insight into what the process behind the phenomenon really is. Looking at these examples it is safe to say that what is happening is not that *los* in (2a) has completely lost its connection with the accusative referent.

(2) c. *La premisa* *ya* ***se*** ***las***
The premise.F.SG already CL.DAT.3 CL.ACC.3PL.F
conté.
tell.1SG
'I already told you guys about the premise.'

(4) *Me* *quedó* *clara* *una cosa*
CL.DAT.1 stay.3SG clear a thing.SG.F
y ***se*** ***las*** *conté.* [3]
and CL.DAT.3 CL.ACC.3PL.F tell.1SG.PST
'Something was clear and I told you guys.'

1.2.3 Swapped roles

Another idea regarding the underlying patterns hidden in these sentences is that of Moreno de Alba (2013). He argues that what might be happening is that *los* has indeed acquired the indirect object features but that the reference to the DO has not been lost but has moved on to lie in *se*. This way, he is proposing that in these dialects, or at least in these structures, the clitics might have swapped roles compared to standard Spanish. *Se* would then be considered accusative and *los* dative. Even if it is true that this could solve the problem of the semantic difference between se *los* and *les* that the previous theory encountered, it still does not explain how *las* in (2c) and (4) can carry number features of the IO and gender features of the DO.

Taking all this into account it is clear that there is a need for the search of a new syntactic proposal that can account for the generation of all the structures shown in (2). That is what will be done in the next section.

2. ANALYSIS PROPOSAL

So far, it has been shown that we are dealing with a structure with two clitics. The first one does not have any overt number or gender features, and the second one exhibits a plural feature that must come from the dative argument and a gender feature from the accusative. First, the behaviour of clitics in the syntactic structure will be examined, followed by an explanation of the operations that might be causing the anomalous pattern of agreement.

2.1 Syntax of clitics

Regarding the syntax of clitics in Romance, and specifically in Spanish, there are two main classic proposals, namely the Movement approach and the Base Generation hypothesis. To understand the differences between them it is necessary to know that clitics in Spanish can be found in a sentence simultaneously with the full DP, with which they share a reference, but this is not necessary. Both (5a) and (5b) are therefore acceptable. One of the main distinctions between these two proposals is precisely how they regard the relation between the clitic and the full DP.

(5) a. *Le* *di* *el regalo*
CL.DAT.3SG give.1SG the present
a mi primo.
to my cousin.
'I gave the present to my cousin.'
b. *Le* *di* *el regalo.*
CL.DAT.3SG give.1SG the present
'I gave him the present.'

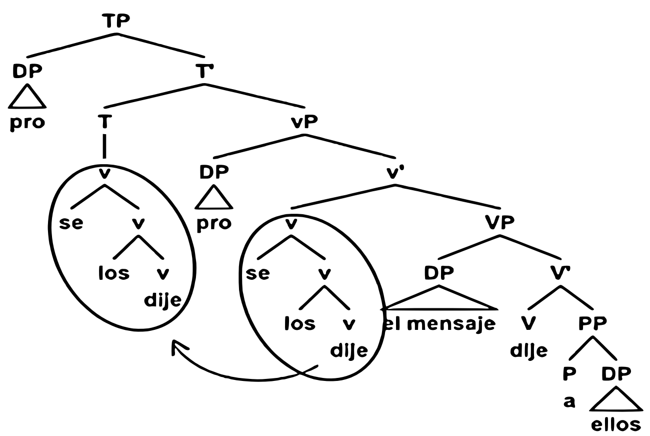
As Romain (2015, 2020) and van Craenenbroeck & van Koppen (2023) explain, followed among others by Sportiche (1996) and Cuervo (2010), Base Generation theories postulate that the full DPs are the elements generated in argument position while the object clitics are externally merged to the inflectional heads in the syntax and work as verbal agreement markers. Under this theory it is assumed that in a sentence like (5b) there is a pro in the place of the full DP. Movement accounts, on the other hand, consider that it is the clitic that is generated in argument position and that it later moves upward to the location where it is pronounced. Even though Movement theories have had trouble facing structures with clitic doubling such as the one in (5a), they argue that because the pronoun is the mandatory element in these sentences, they are the ones that must be externally merged as arguments. It follows, then, that the full DP in doubling constructions is an adjunct and therefore they would no longer state that there is a DO *pro* in (5b).

2.2 Syntax of clitics in the relevant construction

As has already been established, it seems that in sentences like (2a), repeated below, the clitic *los* takes the number feature from the IO and the gender feature from the DO. That means that these clitics must copy the features from the full DPs both when they are overt and in the form of a pro. This is not possible in Movement approaches since they postulate that number and gender features are inherent for the clitics. This implies that the same clitic cannot combine features from two different referents. It therefore looks like the Base Generation approach is the only one that can account for these constructions. The structure to be examined for a

Figure 1

Structure and movement of v-bundle



sentence like (2a) is shown in Figure 1.

(2) a. **Se los** dije (a ellos) (el mensaje).

As shown above, the full DPs are generated in the argument positions in the VP. The clitics, as the verbal agreement markers that they are considered (Romain 2020), are externally merged in little *v*. When there is *v*-to-T movement the verb together with its dependent pronouns moves upwards as a bundle. As explained by Romain (2015, 2020), the idea that these elements form some sort of syntactical unit, at least for movement, is widely accepted. The question here is, of course, how agreement between the clitics and the DPs in the VP happens. The present proposal will follow Chomsky's theory of Agree (2000, 2001). It is important to note that while most postulations under the Base Generation approach were made under the framework of Spec-head agreement, there are not many proposals following these two hypotheses together.

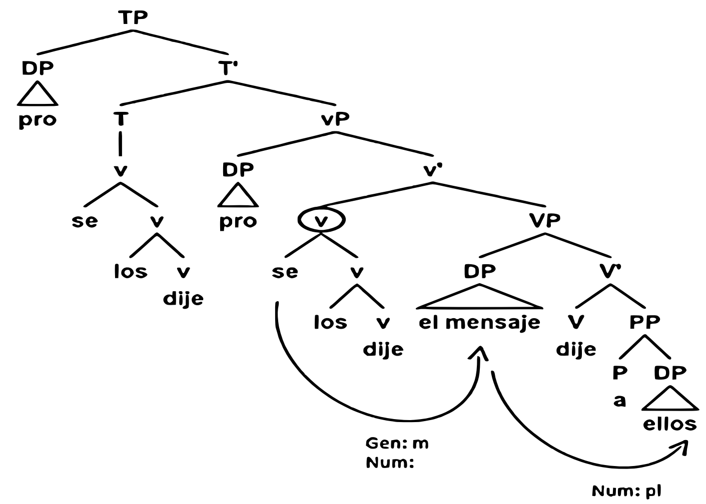
For the clitics to agree with the arguments in the VP, it seems that it is not them individually probing down in the search of a goal but the *v*-bundle as a unit. When there is a construction such as (2a) the cluster does not probe for any gender, but specifically for plural number. What is being proposed here is therefore that these constructions trigger a split phi probe (Béjar, 2003). This means that instead of a single probe targeting all φ-features simultaneously, distinct probes independently target individual features, in this case, number and gender. This split φ-probe has been proposed for some languages like Georgian (Béjar, 2003). This way, the first possible goal that is found is the DP *el mensaje* that has masculine singular features. This means that it is a suitable goal in terms of gender, and so this feature is copied, but not in terms of number. The probe then continues its search for number, and it encounters the DP *ellos* that has a plural feature and is therefore suitable. With this possible behaviour it is being suggested that the features might not be contained specifically in the clitics but in the *v*-bundle. When the information is sent to PF these features are reflected on *lo* because it is the only element that can carry them. This agreement operation is shown in Figure 2 above.

Even though this search for a specifically plural goal might seem surprising, there are other instances in Romance languages in which agreement is favoured by the plural, and therefore by the syntactically specified and most marked number (Nevins, 2011). As D'Alessandro (2017) points out, this can be seen in Abruzzese, in which the past participle is involved in an omnivorous agreement pattern (Nevins, 2007), that is, it might agree with the object (6a) or the subject (6b), and it does with whichever is plural. Examples (6 a) and (6 b) have been taken from D'Alessandro (2017). Of course, the phenomenon is of a different nature, but it shows that the need for a plural agreement feature is something that can be found in Romance.

(6) a. *Giuwannə a pittitə*
John.SG have.3 painted.PP.PL
ddu murə.
two walls.PL
'John has painted two walls.'

Figure 2

Agreement operations in v



b. *Giuwannə e Mmarijə a pittitə*
John and Mary.PL have.3 painted.PP.PL
nu murə.
a wall.SG
'John and Mary have painted a wall.'

As has been said before, some of the speakers that have this type of agreement in their grammar have been found to have a similar pattern with gender, as reflected in (2d), repeated below. In those cases, the process would be the same but instead of the probe copying the gender features of the first possible goal, the DO, it would once again continue looking for a suitable goal if the DO does not have the marked feature, the feminine. No examples have been found in the esTenTen corpus (Kilgarriff, & Renau, 2013) with anomalous agreement in gender and number in the same sentence so further research should look into whether this is also a possibility.

(2) d. *Se la tiré*
CL.DAT.3 CL.ACC.3SG.F throw.1SG
a una de mis amigas.
TO ONE.F.SG OF MY FRIENDS
Un huevo con pintura
a egg.SG.M with paint.
'I threw it to one of my friends. An egg with paint.'

The question that follows from this explanation is what happens when the probe does not find a goal with plural features, or feminine in the more exceptional cases. It is not possible to say that if none of the arguments are plural then the probe will just copy the singular features of the accusative argument because the DO is the first possible goal in the structure and so the probe cannot look ahead and know if it will find a suitable goal in the next argument. Under this proposal, it seems that what must be happening is that if the probe cannot find a suitable number goal, then the *v*-cluster is underspecified for number and consequently gets the default feature, singular in Spanish. As Preminger (2014) explains, the idea is that in cases where no adequate goal matches the clitic's φ-feature specifications, the default accusative clitic, *lo*, is selected. We follow Nevins' (2007, 2011) and Ackema & Neeleman's (2019) idea that singular agreement is simply the lack of plural agreement: that is exactly what seems to be happening here. The same reasoning would follow for gender and hence the v-cluster would get masculine features.

3. CONCLUSION

Clitics in Romance languages have always been a common place for grammar studies and yet certain constructions, probably because of their dialectological nature, have been overlooked in syntactic studies. The anomalous pattern of agreement that I have tried to analyse in this paper has been attributed to several causes in the last decades, namely to a need of tracking the dative referent, to a morphological merge of a dative and accusative clitic into a purely dative one and lastly, to an exchange of references so that *se* has become the direct object clitic and *los* the indirect object one.

The aim in this essay has been twofold. First, the data regarding the construction of interest has been examined under the aforementioned theories, and then an attempt has been made to provide a suitable syntactic explanation that can account for the way in which this construction seems to behave. The ideas of both clitics having become one and of them having swapped references have been rejected because the second clitic agrees in number with the indirect object and in gender with the direct object. These data make us deem the lack of connection with the accusative reference impossible. There is not enough evidence to also rule out the classical proposal of speakers needing to track the reference of the prototypically human referent, but whatever the origin of the phenomenon is, there is a need for a purely syntactic analysis that explains how features of different elements end up copied in one single clitic. The present proposal states that there is a bundle formed in little *v* that probes down and checks for a plural feature to copy, first in the accusative argument and then in the dative one. If it does not find a suitable goal, then the bundle is under-specified for number and gets default singular features.

Of course, this proposal has some limitations that remain unaddressed in this paper. Firstly, additional information about the speakers who produce this structure would be highly beneficial in understanding its underlying mechanisms. For instance, do all speakers who exhibit the anomalous agreement in gender also show it in number? Investigating this could help explain why, despite both gender and number mismatches being theoretically possible, the latter is far more common. Furthermore, it is crucial to determine whether this agreement pattern is optional for all speakers whose grammar allows it and to identify potential factors that trigger the anomalous pattern over the standard one. Lastly, this proposal may have certain weaknesses stemming from the Base Generation approach we advocate for. Specifically, considering that certain elements, clitics in this case, externally merge not in argument positions but higher in the syntactic structure might be a problematic assumption. However, this currently appears to be the only viable way to account for the structure under observation.

The analysis proposed in the present paper is an attempt to understand the syntactic behaviour behind one of the many anomalous patterns of agreement in the Spanish clitic constructions. What is clear is that there is a need for syntactic research to look at these special patterns as it could shed light, not only on the pattern behind them, but also on clitic structures in general, something that is part of the core of grammar.

FOOTNOTES

1,2,3. Taken from esTenTen corpus (Kilgarriff & Renau, 2013)

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A DEDICATED CAUSAL CONNECTIVE FOR SPEECH ACTS

The unusual subjectivity profile of the Italian causal connectives "perché" and "che"

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ABSTRACT

Many causal connectives across languages exhibit a subjectivity profile, often manifesting as a contrast between a main objective causal connective (active in the content domain) and a main subjective causal connective (active in the epistemic and the speech-act domains). This cross-linguistic pattern has provided support for the view that the binary objective-subjective distinction plays a central role in the taxonomy of coherence relations (cf. Sanders et al., 1992). However, the data from Italian presented in this article show an interesting new typological case.

This study investigates the subjectivity of the Italian causal connective perché 'because' and of a nonstandard alternative che. Descriptive grammars suggest that the latter is only used in the speech-act domain, which constitutes a unique subjectivity profile. This study confirmed this experimentally. The findings show that Italian causal connectives behave differently from all other causal connectives which have been studied so far. Further research is necessary to determine whether and how these findings can fit into our current theories on subjectivity and coherence markers.

Keywords: connectives, Italian, Romance, *che* polivalente, subjectivity, coherence relations, cause-effect, causal relation.
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1. INTRODUCTION

Discourse relies on being able to logically connect sentences and their meaning. When listening, for example, one must be able to identify which sentences constitute the main claim and which sentences constitute the argument. The necessary logical connections vary in several ways, constituting what we call different types of coherence relations. Based on the popular taxonomy by Sanders et al. (1992), one of the four ways in which coherence relations can be categorised is according to their source of coherence: either objective or subjective (Sanders et al., 2021). Relations are subjective if they involve the speaker's reasoning or speech acts, and are objective if they are instead strictly related to the propositional content of the clauses (Sanders et al., 2021).

Connective words are one of the tools speakers use to mark coherence relations between sentences. Of particular interest for this article are connectives that mark causal relations between sentences. Causal connectives in English are, for example, 'because', 'since', 'so', and 'therefore'. Previous research has shown that, in languages that possess several causal connectives,

the speaker's choice about which one to use is often influenced by the source of coherence. So we find that many languages employ a partial "division of labour": connectives for subjective causal relations and connectives for objective ones (see section 2.1).

This article presents a study on the subjectivity profile of two Italian causal connectives: *perché* 'because' and the non-standard alternative *che*. The case of Italian causal connectives is particularly interesting because they have received relatively little attention (see section 2.2) and, crucially, because the "division of labour" of these two connectives appears to constitute a typological case distinct from the ones attested so far. Preliminary insights, based on native speaker intuition and a brief review of descriptive grammars, suggest that *che* is a causal connective specialised at introducing the justification for a speech-act (see sections 2.3-2.4). The current study will confirm this experimentally (sections 3-6).

2. THEORETICAL FRAMEWORK

2. 1 Source of coherence and domains

The concept of source of coherence (objective vs. subjective coherence relations) is related to the one of causal domain (Li et al., 2013; cf. Degand & Pander Maat, 2003; Evers-Vermeul et al., 2011; Sanders & Spooren, 2009). Objective causal relations mainly pertain to the content domain, in which the speaker describes a causal relation in the "real world" (Sweetser, 1990, p. 77, as cited in Li et al., 2013). The content domain has two subdomains: the non-volitional and the volitional domain. In the volitional domain, the "consequence" in the causal relation happens because of somebody's intentional act; in the non-volitional it does not. See (1).

(1) English (Li et al., 2013, p. 81)

a. Non-volitional content domain

Bob fell off the bike. As a result, he got hurt in the left leg.

b. Volitional content domain

It was a very hot day; that's why Bob went swimming.

Subjective relationships mainly pertain either to the epistemic domain or to the speech-act domain (Li et al., 2013). In the epistemic domain, the causal relation happens in the logical reasoning of the speaker (Sweetser, 1990, p. 77, as cited in Li et al., 2013). In the speech-act domain, the reason clause justifies the speech act happening in the main clause, e.g., the command or question of the main clause (Sweetser, 1990, p. 77, as cited in Li et al., 2013). See (2).

(2) Italian (own knowledge)

a. Epistemic domain

Mi sa che il cane è passato di qua, perché vedo le sue orme.

'The dog must have been here, since I can see its paw prints.'

b. Speech-act domain

Quando dobbiamo andare? Che non mi ricordo più.

'When do we need to go? I can't remember.'

The binary division objective-subjective has found support in the fact that, in several languages, a pair of causal connectives is found, one of which primarily marks subjective causal relations and one which primarily marks objective ones. This is the case in Dutch (Degand, 2001; Degand and Pander Maat, 2003; Pit, 2007; Sanders & Spooren, 2015), French (Degand and Pander Maat, 2003; Pit, 2003; Zufferey, 2012), German (Pit, 2003; 2007), Turkish (Çokal et al., 2020) and Mandarin (Li et al., 2013; Xiao, Li, et al., 2021; Xiao, Sanders et al., 2021). Recent studies even suggest that languages that do not have such a pair of connectives mark subjectivity in this way through prosody (Hu et al., 2023). This would suggest that grouping together the epistemic and the speech-act domains must be meaningful.

2.2 Previous studies on the subjectivity of Italian connectives

To the best of the author's knowledge, the study of Fagard and Degard (2010) is the only one which has explicitly investigated the subjectivity of Italian connectives before. In their diachronic corpus study of French and Italian causal connectives, the authors looked at two Italian connectives, namely *perché* and *ché* (both meaning 'because').[1] However, the historical connective ché studied here (spelled with an acute accent), is a different connective from the modern *che polivalente* 'polyfunctional *che*', which is investigated in the present study (see following subsection). Fagard and Degard (2010) mention this (fn. 6; p. 120) and explain that the two connectives have different etymologies (Previtera, 1996, as cited in Fagard and Degard, 2010;

also cf. Panebianco & Varani, 2009, pp. 368-369). Given this, Modern Italian causal connectives remain heavily understudied in terms of subjectivity and domains.

2.3 Che polivalente

The Italian word *che* is mainly used as a complementiser or as a relative pronoun (like the English 'that'). However, in informal registers of Italian it has several uses which are considered non-standard (Berruto, 1989; Panebianco & Varani, 2009, pp. 368-369; Fiorentino, 2010; etc.). This phenomenon is known as *che polivalente* 'polyfunctional che'. One of such nonstandard uses is its use as a coordinating causal connective (Renzi et al., 1991, pp. 742-743; Panebianco & Varani, 2009, p. 369; Berruto, 1989; Fiorentino, 2010; etc.). See (3).

(3) Italian (Fiorentino, 2010)
Vai a dormire <u>che</u> ne hai bisogno.
'Go to sleep, <u>since</u> you need it.'

The function of this connective che is often described as being causal in some cases and "esplicativo-consecutiva" [consecutive-explanatory] in others (Berrutto, 1989, p. 69, p. 147; Fiorentino, 2010). The latter definition is used when the connective introduces a sentence which provides the direct consequence and purpose of the action suggested in the main clause (roughly translatable as 'so that'). See (4).

(4) Italian (Berrutto, 1989, p.69)
Vieni <u>che</u> ti pettino.
'Come here, <u>so that</u> I'll comb your hair.'

Within the taxonomy of Sanders et al. (1992), this distinction between causal and consecutive-explanatory coherence relations does not result in different relation types, as both uses of *che* would be considered as markings of subjective causal relations (T. J. M. Sanders, personal communication, March 26, 2024).

2.4 Domains in which *perché* and *che* are used

Given that few experimental studies explicitly assessed the subjectivity of Italian connectives (see section 2.2), this subsection will use descriptive grammars and the author's own native judgement to draw hypotheses on the subjectivity profile of the causal connectives *perché* and *che*.

Renzi et al. (1991) show that the causal *che* can be used to introduce a justification for a speech act (pp. 742-743), including commands, questions, thanksgivings, apologies and greetings. The rest of the literature does not point this out explicitly, but almost all examples of causal *che* fall within the speech-act domain (e.g., Fagard & Degand, 2010, p. 189; Renzi et al., 1991, pp. 742-743; Berrutto, 1989, p. 69; p. 147; Panebianco & Varani, 2009, p. 369; Fiorentino, 2010, examples 1 and 2; etc.; the only exception is in example 5 below). If Italian follows the pattern observed in the other languages mentioned in section 2.1, the expectation would be that this is a subjective connective (like e.g., Dutch want 'since') and that it must also be active in the epistemic domain. However, no such uses have been documented, so far. In the literature consulted for this article, the only example of a use of *che* which does not fall in the speech-act domain is reported in (5).[2] Here, *che* introduces a volitional content causal clause.

(5) Italian (Fagard & Degard, 2010, p. 189)
Rientro subito <u>che</u> devo prendere il camioncino.
'I'm coming home right now, <u>since</u> I need to take the van.'

The hypothesis that *che* is not active in the epistemic domain is supported by the author's own knowledge of the language.[3] According to the native judgement of the author, *che* is mainly felicitous in the speech-act and the volitional domains. Its main alternative *perché* is mainly felicitous in the content domain (volitional and non-volitional) and in the epistemic one. The judgements are summarised in (6), in which infelicitous options are marked with a hash ('#'). Note that since the judgements are a matter of felicity, no sentence feels completely disallowed. Also, as Renzi et al. (1991) also notice (pp. 742-743), speech pauses play a role.

(6) Italian (own knowledge)

a. Non-volitional content domain
Fuori è bagnato perché/#che ha piovuto.
'It is wet [on the ground] outside *perché/#che* it rained.'

b. Volitional content domain
Angelo viene più tardi perché/che deve finire di pulire la cucina.
'Angelo is coming later *perché/che* he needs to finish cleaning the kitchen.'

c. Epistemic domain
I vicini devono essere a casa perché/#che le luci del salotto sono accese.
'The neighbours must be home *perché/#che* the lights in the living room are on.'

d. Speech-act domain
Sbrighiamoci ?#perché/che tra un ora chiude.
'Let's hurry up ?#*perché/che* it will close in an hour.'

3. THE CURRENT STUDY

Primary insights based on literature on the *che polivalente* and on the author's own judgements (see sections 2.3-2.4) lead to think that the landscape of Italian causal connectives is different than the one in the languages investigated so far. It seems that it is not the case that you have a subjective and an objective connective, but rather a connective mainly specialised for the speech-act domain (*che*) and one used in all other domains (*perché*). If this is true, Italian represents a newly found typological case which poses a threat to the emergent hypothesis that, across languages, the main way causal connectives mark their source of coherence is by having a subjective-objective binary distinction. Given these intriguing premises, confirming these facts about Italian causal connectives becomes crucial.

On the basis of what was discussed in section 2.4, the hypothesis is that *che* will be preferred over *perché* in the speech-act domain. In the volitional domain, instead, both *che* and *perché* will be able to be used. In the non-volitional objective domain and in the epistemic domain *perché* will be preferred.

4. METHODS

The experiment was an adaptation of the connective insertion task used by Santana et al. (2021) and Savinova et al. (2023). Because it provides clear and easy-to-obtain results (Santana et al., 2021; Savinova et al., 2023), this type of task constitutes the best method to assess the subjectivity profile of connectives in a language that has not been investigated yet in this regard (Savinova et al., 2023).

4.1 Participants and procedure

45 participants whose native language is Italian took part in the study. They were recruited through the author's personal network. Participants filled in a questionnaire using Qualtrics, which they accessed through an anonymous link. They were asked to insert the connective they preferred in 36 sentences. The instructions were the following: "Immagina di essere a casa o al bar, parlando con un amico o un familiare. Riempi lo spazio vuoto (___) in ognuna delle seguenti frasi, scegliendo tra le opzioni quella che useresti." [magine you are at home or at the cafe, speaking to a friend or a relative. Fill in the blank space (____) in each of these sentences, choosing from the options the one you would use.] These instructions were repeated a few times throughout the questionnaire, in order to push participants to use a colloquial register where the causal *che* is also available (see section 2.3).

To ensure informed consent, all the participants were made aware that they were taking part in a linguistic experiment[4] and they were provided a way to contact the researcher to ask any question. All responses were completely anonymous and it is not possible to retrieve the identity of the participants on the basis of the very little metadata collected. The participation in this study was voluntary, and participants could withdraw from the study at any time, with no penalty.

4.2 Materials

The questionnaire contained 24 research items and 12 filler items. The full list of items (with translation) can be found in Appendix I. The order of the items was randomised for each participant. Like Savinova et al. (2023) and unlike Santana et al. (2021), items were invented rather than extracted from corpus data. Research items were constituted by two clauses connected by a positive causal coherence relation with basic order (cf. Sanders et al., 1992). The two clauses were separated by a blank space: "____". Six items for each of the four domains were included: non-volitional content domain, volitional content domain, epistemic domain and speech-act domain. The items were created for this study using the definitions of Li et al. (2013; p. 87). See Table 1.

The six speech-act clauses were constituted by three commands and three questions. For the question items, a decision had to be made about where to place the question mark. In the examples in literature, question marks are between the two clauses when the connective is *perché* and are, instead, at the very end when the connective is *che*. See (7).

Table 1

Paraphrases used by Li et al. (2013) to sort causal relations

Domain	Paraphrase
Non-volitional content	P leads to the physical/mental fact that Q, and no intention is involved in Q
Volitional content	P leads to the intentional physical/mental fact that Q
Epistemic	P leads to claim/decision/inference/conclusion that Q
Speech act	P leads to question/advice/command/promise that Q

(7) Italian (Renzi et al., 1991, pp. 742-743)

a. *Mi puoi prestare la macchina?*

Can you lend me your car?

Perché la mia non funziona.

perché mine doesn't work.

b. *Mi puoi prestare la macchina,*

Can you lend me your car

che la mia non funziona?

che mine doesn't work?

'Can you lend me your car? Mine doesn't work.'

It has been chosen to put the question mark between the sentences, since putting it at the end resulted in the subjective reading being completely unavailable with the connective *perché*. See (8), which can only be interpreted, according to the author's judgement, as a causal relation connecting the propositional content of the clauses.

(8) Italian (own judgement)

a. Mi puoi prestare la macchina perché la mia non funziona?

Can you lend me your car *perché* mine doesn't work?

'Can you lend me your car, doing it because mine doesn't work?' (available reading)

*'Can you lend me your car? I'm asking this because mine doesn't work.' (unavailable reading)

b. Mi puoi prestare la macchina?

Che la mia non funziona.

Can you lend me your car?

Che la mia non funziona.

che mine doesn't work.

'Can you lend me your car? I'm asking this because mine doesn't work.'

The filler items were sentences with adversative/concessive coherence relations (i.e. with negative polarity, in the taxonomy of Sanders et al., 1992). The connectives which were available for the participants to choose were *perché*, *che*, and three filler options (*ma* 'but', *però* 'but/though' and *anche se* 'although').

5. RESULTS

The results have been analysed with a series of chi-squared tests using JASP. The domain (non-volitional, volitional, epistemic or speech-act) had a very large effect on the choice between the causal connectives *perché* and *che* ($\chi 2$ (3) = 411.611, p < .001, Cramer's V = .632). See Table 2.

Che is the preferred option in the speech-act domain ($\chi 2$ (1) = 35.506, p < .001), while perché is preferred in the epistemic domain ($\chi 2$ (1) = 182.699, p < .001) and in the content domain, both non-volitional ($\chi 2$ (1) = 232.754, p < .001) and volitional ($\chi 2$ (1) = 136.862, p < .001). Consequently, the speech-act domain is the one in which che is used most often, largely more than in the volitional domain ($\chi 2$ (1) = 161.208, p < .001, φ = .554). The volitional domain, in its turn, employs che slightly more often than the epistemic domain ($\chi 2$ (1) = 6.408, p = .011, φ = .112). Finally, the epistemic domain employs che slightly more often than the non-volitional content domain ($\chi 2$ (1) = 4.978, p = .026, φ = .099). See (9) for a recap.

(9) Domains sorted in the likelihood of using che rather than perché

speech acts >> volitional content > epistemic > non-volitional content

A medium effect of the type of speech act was also found. Commands employed che more often than questions ($\chi 2$ (1) = 29.233, p < .001, φ = .332). See Table 3.

Table 2

Count and percentage of uses of perché *and* che *in each of the four domains*

	Non-volitional (*n* = 260)	Volitional (*n* = 261)	Epistemic (*n* = 246)	Speech act (*n* = 265)	Whole questionnaire (*n* = 1032)
perché	253 (97%)	225 (86%)	229 (93%)	84 (32%)	791 (77%)
che	7 (3%)	36 (14%)	17 (7%)	181 (68%)	241 (23%)

Table 3

Count and percentage of uses of perché *and* che *with commands and questions*

	Command (*n* = 134)	Question (*n* = 131)	Speech-act domain overall (*n* = 265)
perché	22 (16%)	62 (47%)	84 (32%)
che	112 (84%)	69 (53%)	181 (68%)

6. DISCUSSION

The results confirm the hypotheses. *Che* is not a broadly subjective connective spanning over both the epistemic and the speech-act domain, like the ones found in other languages (e.g., Dutch *want*). *Che* is rather a connective used mainly in the speech-act domain. *Perché*, on the other hand, is used in the content and in the epistemic domain.

Another intriguing result is the fact that the subjectivity of the domain could not predict the uses of *che* and *perché* monotonically: *che* was used less often in the epistemic domain than in the volitional content domain, even though the former is considered a more subjective domain than the latter (this is in line with the predictions of section 2.4). Given that the connective insertion task may exaggerate the speakers' preference for a certain connective (Savinova et al., 2023) and the fact that che was possibly at a disadvantage because of it being nonstandard (Berruto, 1989; Panebianco & Varani, 2009, pp. 368-369; Fiorentino, 2010; etc.), it is possible that *che* and *perché* are equally acceptable in the volitional domain. This would create a very interesting profile for the connective *che*. See Table 4. More research into the matter is necessary to confirm this.

Perché was used more often following questions than when following commands. It cannot be determined to what extent this has been determined by the position of the question mark in the items, which favoured *perché* (see section 4.2).

7. CONCLUSION

This study investigated the use of two Italian causal connectives with a connective insertion task. The connectives are *perché* and the nonstandard *che*. The results show that *perché* is active in the content domain and in the epistemic domain, while *che* is mainly active

Table 4

Availability of the connectives perché *and* che *in the four domains*

	Non-volitional	Volitional	Epistemic	Speech act
perché	preferred	available	preferred	dispreferred
che	dispreferred	(possibly) available	dispreferred	preferred

in the speech-act domain. The effect of subjectivity (measured through the domain) was nonmonotonic, as *che* was employed more often in the volitional domain than in the epistemic domain.

The subjectivity of these connectives should be further investigated using other methods, such as corpus research and sentence continuation tasks (cf. Savinova et al., 2023). This could give further insights into the behaviour of *perché* and *che* in the volitional domain, which is of particular interest (see section 6). Factors other than the domain should also be taken into account, such type of speech act, Subject of Consciousness and prosody (speech pauses are relevant to determine the subjectivity of the connective; cf. Renzi et al., 1991, pp. 742-743).

The interesting profile of these connectives contrasts with the pattern found in many languages, which sees an objective connective, active in the content domain, and a subjective connective, active in the epistemic and in the speech-act domains (see section 2.1). Future research should assess whether and how these findings can fit into our current theories on subjectivity and coherence relations.

FOOTNOTES

1. The occurrences of perché sampled within their corpus of written Modern Italian mainly belonged to the content and epistemic domain (each of these two domains constituting between 40% and 50% of the total occurrences; Fagard & Degard, 2010, Graph 6). The occurrences of ché mainly belonged to the epistemic domain (little over 30%) and speech-act domains (51/100 occurrences; Fagard & Degard, 2010, Graph 5).

2. Fagard and Degard (2010) consider the connective in example (5) to be the historical connective ché, rather than the modern che (fn. 6). However, they do not report how they distinguished the two. The sentence in (5) is felicitous in Modern Italian (based on own knowledge of the language), indicating that the connective may be an instance of the modern che.

3. Note that these judgements only served to draw hypothesis for this study. The main findings of the paper, which align to these hypotheses, have been confirmed experimentally (see sections 3-6).

4. This study has originally been conducted in order to write a paper for the course Discourse, Cognition and Communication (TLRMV16107) at Utrecht University.

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APPENDIX I - MATERIALS

Objective (non-volitional)

1. *Fuori è bagnato ____ ha piovuto.*
   'It is wet [on the ground] outside ____ it has rained'
2. *Gli alberi cominciano a perdere le foglie ____ le temperature si sono abbassate.*
   'The trees are starting to lose their leaves ____ temperatures have dropped.'
3. *Il telecomando si è rotto ____ è caduto a terra due volte.*
   'The remote control has broken ____ it has fallen twice on the floor.'
4. *Mio fratello si sentiva solo _____ tutti i suoi amici erano in vacanza.*
   'My brother felt alone ____ all of his friends were on holiday.'
5. *Paolo si è spaventato ____ aveva visto un fantasma.*
   'Paul got scared ____ he saw a ghost'
6. *Maria è forte a calcio ____ ha ereditato la passione del padre.*
   'Mary is good at football ____ she inherited her father's passion'

Objective (volitional)

7. *Rimangono a casa ____ il bar è chiuso.*
   'They're staying at home ____ the bar is closed.'
8. *Angelo viene più tardi ____ deve finire di pulire la cucina.*
   'Angelo is coming later ____ he needs to finish cleaning the kitchen.'
9. *Tua sorella ha comprato un materasso nuovo ____ quello vecchio si era rovinato.*
   'Your sister bought a new mattress ____ the old one was ruined.'
10. *Alfredo inizia a immaginare di stare al mare ____ vuole rilassarsi.*
11. 'Alfredo starts to imagine being at the seaside ____ he wants to relax.'
12. *Nonno Mario si concentra ____ vuole risolvere il puzzle in fretta.*
    'Grandpa Mario is concentrating ____ he wants to solve the puzzle fast.'
13. *Anna si è promessa di andare a Roma prima o poi ____ vuole vedere il Papa.*
    'Hannah promised herself to go to Rome sooner or later ____ she wants to see the Pope.'

Subjective (epistemic)

14. *I vicini devono essere a casa ____ le luci del salotto sono accese.*
 'The neighbours must be home ____ the lights in the living room are on.'
15. *Giovanni secondo me non verrà ____ so che è malato.*
 'John won't come, I think (according to me), ___ I know he is ill.
16. *Giulia avrà massimo trent'anni ____ andava in classe con Andrea.*
 'July must be thirty at most ____ she went to school with Andrew [they were in the same year].'
17. Zio Lucio avrà già finito di lavorare adesso____ oggi ha cominciato prima.
 'Uncle Lucio must have already finished working by now ____ he started earlier today'
18. Lei deve essere la figlia di Monica ____ si somigliano molto.
 'She must be Monica's daughter ____ they look a lot like each other.'
19. Secondo me, ci vorrà tanto tempo ____ Simone pure ci ha messo quattro ore in totale.
 'I think (according to me,) it will take a long time ____ it took Simon also four hours in total.'

Subjective (speech act)

20. *Mi presti una penna? ____ la mia è finita.*
 'Can you lend me a pen? ____ Mine has run out of ink.'
21. *Quando dobbiamo andare? ____ non mi ricordo più.*
 'When do we have to go? ____ I can't remember anymore.'
22. *Riesci a riportarmela domani? ____ mi serve.*
 'Can you bring it back tomorrow? ____ I need it.'
23. *Sbrighiamoci ____ tra un ora chiude.*
 'Let's hurry up ____ it will close in an hour.'
24. *Vieni qua ____ là è pericoloso.*
 'Come here ____ it is dangerous there.'
25. Accomodatevi ____ arrivo subito.
 'Take a seat ____ I'll come soon.'

Filler items

26. Vorrei venire ____ purtroppo non ho tempo.
 'I'd like to come ____ unfortunately I don't have time.'
27. Oggi piove ____ domani fa bel tempo.
 'It's raining today ____ tomorrow the weather will be nice.'
28. Fa freddo ____ puoi accendere il riscaldamento.
 'It's cold ____ you can turn on the heating.'
29. Lunedì mi sono fatta la ceretta____ oggi i peli già mi sono ricresciuti.
 'On Monday I got my hair waxed ____ today the hair has already grown back.'
30. Sono stato a Pompei ____ non sono mai stato a Napoli.
 'I have been to Pompeii ____ I've never been to Naples.'
31. Papà ha fame ____ non ha voglia di cucinare.
 'Dad is hungry ____ he does not feel like cooking.'
32. Ti piace ballare ____ non ti piace esibirti.
 'You like dancing ____ you don't like performing in public.'
33. Le fave gli piacciono molto ____ non le può mangiare.
 'He likes fava beans a lot ____ he can't eat them.'
34. Ci piace farci il bagno ____ preferiamo non farlo quando l'acqua è fredda.
 'We like to swim ____ we prefer doing it when the water is not cold.'
35. La pizza era buona ____ era un po' insipida.
 'The pizza tasted good ____ it missed a little bit of salt.'
36. Mia cugina gioca a scacchi ____ io non so giocare.
 'My cousin plays chess ____ I can't play.'
37. Voi dite che sono stato io ____ non mi avete visto.
 'You say I did it ____ you didn't see me.'

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USING PRAGMATICS TO EXPLAIN GRAMMATICALITY OF GENERICS: A RESEARCH PROPOSAL

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ABSTRACT
A typical characteristic of generic constructions is that they involve the dropping of an argument, whether internal or external. However, some predicates cannot lose arguments without resulting in ungrammaticality. Semantic and pragmatic theories on restrictions of genericity exist, but this paper seeks to restate genericity restrictions in more cognitive terms by applying information theory principles. To do so, a grammaticality judgement task and connected corpus study are proposed to determine whether argument set entropy in combination with pragmatic principles can be used to predict grammaticality. The expected findings of this proposed study could strengthen the evidence for pragmatic models and provide support for future work using a Bayesian framework.

Keywords: genericity, entropy, pragmatics, information theory.
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1. INTRODUCTION

Information theory has been used in linguistics to quantify message complexity and likelihood of errors (van Ewijk & Avrutin 2016). Some linguists have adopted the theory as a framework for approaching sentence production and comprehension, allowing them to make predictions about lexical access based on the information carried by linguistic forms and the entropies of the sets into which those forms are grouped in memory (Kostic 1995).

The application of information theory to pragmatic theory allows probabilistic modelling of speaker performance and hearer comprehension. This means that instead of relying purely on constraints, principles, or maxims, analysis of linguistic behaviour can more easily handle 'noisy' and imperfect data. Probabilistic models do not necessarily need to replace the categorical rules found in formal syntax and semantics, but can in some cases be very helpful. Specifically, this research proposal seeks to apply an information theory framework to an area of intersection between pragmatics, semantics, and syntax – grammaticality of generic constructions

– in order to illustrate one way in which an information theory-informed pragmatics can aid and improve upon formal semantic and syntactic predictions. Härtl (2013) uses the 'monotonicity condition' to constrain generic construction grammaticality. If the predictions of the present proposal are correct, then Härtl's formal semantics principle can be re-expressed in information theory-compatible terms.

First, in section 2, this paper will outline genericity and generic constructions, using syntactic, semantic, and pragmatic terms. Härtl's monotonicity condition will be introduced and argued in favour of. In section 3, a brief summary of information theory and its relevance to linguistics will be given, and a connection will be proposed between Härtl's theory and the perspectives offered by information theory. It is argued that the monotonicity condition can be understood as relating to constraints on lexical access, governed by information theory concepts of message information and entropy. In the remaining sections, the research proposal will be outlined, calling for a grammaticality judgement task that seeks to test this hypothesis.

2. FORMAL RESTRICTIONS ON GENERICITY

By removing direct objects from transitive verbs, sentences can take on meanings that are generic or habitual. For example, (1a) states that John is reading a specific book but not any book or readable object, whereas (1b) states merely that John is engaged in the action of reading and is compatible with the possibility that he is reading any book, or any thing.

(1) a. John reads the book.
b .John reads.

However, not all verbs and constructions are equally open to generic alternations. Removing the direct object from (2a) results in ungrammaticality (2b).

(2) a. Margaret resembles her sister.
b. *Margaret resembles.

Objects (direct or indirect) can also be moved to subject position, forming a 'middle' construction (Fagan 1988):

(3) The book reads easily.

Middle constructions are generic in the sense that the agent or 'doer' of the action described by the predicate is not specific: in (3), the meaning is that '(regardless of who does the reading) the book reads (is read) easily'. This contrasts with the genericity of (1b), where the agent is not generic but the action is. An additional difference between genericised transitives and middles is that the generic argument of middles must be some kind of agent or performer (Authier & Reed 1996; Härtl 2013), whereas there are no such thematic restrictions on the generic argument of transitives.

Härtl (2013) points out that adding context can frequently 'rescue' genericised transitives, middles, and other generic constructions:

(4) a. *Harold unlocks.
b. Harold unlocks [some contextually present entity].

(5) a. *Wood paints easily
b. Painters have favoured materials, and wood paints easily.

For Härtl, predicates can only enter generic constructions if they satisfy the 'monotonicity condition': no truth-conditional content may be removed from the semantic representation of the predicate, which includes a specification of its arguments. Crucially, content can be effectively offloaded to the discourse, allowing its recovery through (some kind of) pragmatic reasoning. Thus, so long as the non-stated argument (e.g. a door, or a painter) of a predicate is pragmatically available, it can be present in the representation and the sentence is grammatical.

It is important at this point to make a distinction between verbs used in generic constructions on the one hand, and unergative and unaccusative intransitive verbs on the other. These verbs all share one property: possessing only one argument, whether internal or external. Unaccusative verbs are similar to generic middle verbs in that they lack an overt 'doer' or agent (see 'exists' in (6)). Unergatives are similar to 'genericised transitives' in that they possess an agent but no (overtly-expressed) object to which the described action is done (see 'runs' in (7)).

(6) John exists.
(7) John runs.

There is some disagreement on what distinguishes these two types of intransitives from each other (though an extended discussion is beyond the scope of this paper). A common semantic distinction is that unergatives describe atelic actions (lacking an endpoint) while unaccusatives describe telic ones; a common syntactic distinction is that unergatives have no internal argument while unaccusatives have no external argument (Montrul 2005). Generic verbs, however, are by definition atelic. Furthermore, if Härtl's monotonicity condition is correct, generics also possess more than one argument, but the second argument appears to lack explicit syntactic realisation. There are thus reasons to doubt that generics are just unaccusatives or unergatives, or even just another kind of intransitive, and more importantly, there is further evidence that recourse to pragmatic principles (i.e. the monotonicity condition) is required to capture the properties of generics.

Although promising, Härtl's argument for the monotonicity condition rests on "saliency" of verbs and their arguments in discourse, which is a pragmatic consideration and thus difficult to define through formal semantics. Furthermore, he does not make a prediction that should be a direct consequence of his hypothesis: some predicates are more likely than others to be amenable to generic constructions, depending on the 'informational saliency' of the different elements of their lexical semantic representations. By applying an information theory analysis to the topic, we may be able to reformulate monotonicity more concretely and allow for a spectrum of grammaticality.

3. INFORMATION THEORY

Applied to linguistics, an information theory-informed framework can be used to make predictions about the likelihood of selecting or activating given linguistic representations from a set of possible choices (Goldsmith 2007). More frequently-encountered words or forms carry less 'information' and are faster to be accessed, as shown by studies using lexical decision tasks (Kostic 1995). In information theory, the 'entropy' of a set of items is calculated, which corresponds to the level of uncertainty about which element from a set will be chosen (Goldsmith 2007). In sets with low entropy, there is low uncertainty, meaning that one element is significantly more likely than the others to be selected. In situations with high entropy, it should be much harder to correctly predict which element is the ultimate outcome. Generally, sets in which one element is significantly more probable than all the others have lower entropies, while sets with similarly-probable elements have higher entropies.

Based on Härtl's argument, a generic transitive like (1b) is grammatical because the object argument of the predicate is sufficiently salient to be recoverable. But where does this saliency come from? Information theory may provide an answer: the set of internal arguments selected by the predicate ('read') has an entropy that is sufficiently low enough as to be recoverable. In other words, dropping the internal argument is licensed by the low entropy, making it relatively easy for the parser to access an appropriate representation. In (2b), however, the set of internal arguments of the predicate is predicted to have high entropy, increasing the difficulty of the parse and rendering the sentence ungrammatical or ill-formed. Since middle constructions involve dropping of the agent, the relevant set is that of the external argument selected by the predicate.

4. RESEARCH PROPOSAL

The conditions for genericity appear to be based on informational saliency, which is defined through context. Provided sufficiently felicitous pragmatic conditions, it may be the case that almost any predicate can take on a generic meaning. However, some predicates may at baseline be closer to satisfying the conditions for genericity than others. This paper proposes a link between the entropy of the set of possible arguments and possibility of a generic interpretation. Therefore, a grammaticality judgement task with two between-subjects conditions is proposed: one in which verbs are presented without contexts that are amenable to a generic interpretation, and one in which the context supports a generic interpretation. Furthermore, both middles and transitives will be used and compared. The entropy of the set of internal and external arguments will be calculated using frequency data from a corpus. It is predicted that words with smaller set entropy will be more amenable to generic interpretations when the context is not felicitous, and will have a smaller increase in amenability when the context is felicitous, compared to words with larger set entropies.

In comprehension tasks, entropy has been found to facilitate lexical access (van Ewijk & Avrutin 2016), presumably because lexical networks with high entropy are well-connected and spread activation between representations faster than do networks with lower entropy. However, the opposite is the case for production tasks (van Ewijk 2013) precisely because in low entropy networks, less activation is spread from and lost by the less activation is spread from and lost by the target representation. Most language comprehension studies in the information theory literature use lexical decision tasks as their experimental paradigm; the author is aware of none that use a grammaticality judgement task (GJT). At first glance the GJT appears to be another kind of comprehension task. However, in the condition where the context is not felicitous, the argument 'missing' from the generic construction will not have been mentioned in the discourse, requiring participants to retrieve it themselves from their pre-existing lexicon. For this reason, parsing generics in the infelicitous condition seems more similar to a production task than a comprehension task. Therefore, it is reasonable to hypothesise that low entropy sets facilitate, rather than inhibit, linguistic processing.

Härtl assumes that interlocutors think pragmatically when using and understanding generic middles. If so, it should be possible to apply an information-theoretic framework to the analysis, such as the Rational Speech Act (RSA) framework (Scontras, Tessler, & Franke, 2021). RSA uses Bayesian inferences to model reasoning by interlocutors during communication. According to RSA, listeners reason about the meanings of messages on multiple layers. At the lowest level, the 'naïve' listener possesses prior beliefs about the truth value of encountered utterances, and updates those beliefs based on the possibility of utterances being true/false. At a higher level, 'pragmatic' listeners take into account the speaker, reasoning about the probability of speakers conveying some meaning, given the prior probability of that meaning being true/false.

The relevance of this research proposal to this kind of pragmatic modelling is that it may provide a method for modelling prior probabilities for the phenomenon of interest. These are a particularly slippery, poorly-understood aspect of the framework. For example, in their seminal study applying RSA predictions to behavioural data, Frank and Goodman (2012) used a highly restricted and abstract 'toy' context in which prior probabilities must be assigned to only three possible referents. In practice, the sets that prior probabilities must be provided for are large and dynamic, limiting the applicability of RSA. By making use of corpus data as a source of prior probabilities, the present research proposal can obtain findings that more naturalistically reflect actual language use and comprehension.

This proposal makes two clear predictions: (a) verbs in generic constructions presented with context are more likely to be accepted, or judged as grammatical, than verbs presented without context, and (b) entropy of the set of arguments selected by verbs is (negatively) correlated with rate of grammaticality judgements. The first prediction is effectively a test for the predictions of the monotonicity condition and acts as a sanity-check for this proposal. The second prediction is of greater interest, and if borne out, would allow for an information-theoretic analysis of syntactic and semantic grammaticality.

5. METHOD

5. 1. Procedure and stimuli

Participants will perform a simple grammaticality judgement task. Native speakers of English will read sentences containing verbs in generic constructions, and judge whether or not they think each sentence is acceptable in English. Sentences containing verbs in other constructions (e.g. passives, syntactic ambiguities) will also be presented as filler items.

Test sentences will always form part of multiple-sentence discourses, will be underlined, and will come at the end of each discourse. In the 'With context' version, the surrounding sentences will create discourse coherence and contain the argument that is 'missing' from the generic construction. In the 'Without context' version, the surrounding sentences will not contain the missing argument. For transitives, the generic internal argument will be a direct object of the verb. Test items will be created in pairs – one form for each context version – and participants will see either one or the other version during the experiment. They will see an equal number of With context/Without context items during the experiment.

Note, in the examples below, that the sentence that varies between the context/no context condition varies depending on whether the construction is a middle or a generic transitive. Middles involve a generic external argument, so the first sentence (containing the 'doer' of

the predicate) must change. Generic transitives involve a generic internal argument, so the second sentence (containing the object of the predicate) must change instead.

The experiment can be performed online, for example using a participant crowdsourcing platform like Prolific (www.prolific.com). The aim would be to recruit at least 60 participants to safely reach sufficient statistical power for an experiment with 2 between-participant conditions.

Example stimuli with a middle construction

With context:

The plumber has a lot of work to do. Several pipes are leaking, and fixing the bathroom sinks is a complex task. Fortunately, the new toilets install easily.

Without context:

The building is in a poor state of repair. Several pipes are leaking, and fixing the bathroom sinks is a complex task. Fortunately, the new toilets install easily.

Example stimuli with a transitive verb

With context:

The security chief has a large office. Sometimes his colleagues come to ask him for help opening a door. He always comes quickly to unlock.

Without context:

The security chief has a large office. Sometimes his colleagues come to ask him for help opening for the day. He always comes quickly to unlock.

5. 2. Corpus data and entropy calculation

Using the NOW (News on the Web) English-language corpus of written English (Davies 2016-) the internal and external arguments for all verbs used in target, test sentences of experimental stimuli will be identified, and their frequencies enumerated. It is possible that arguments will need to be grouped into certain categories first (e.g. proper names). Once collected, the entropy of argument sets will be calculated, and in the analysis, correlations between the argument set entropy of each verb and grammaticality judgement rates for the 'Without context' sentences using those verbs will be searched for. A high degree of correlation would support the hypothesis that set entropy can predict grammaticality judgement rates; a failure to find a correlation would not support the hypothesis. Set entropy will be calculated by finding the sum of the negative weighted log probabilities of each item (word/verbal argument). Item probabilities can be derived from their frequencies.

Set entropy formula

$$H = \sum_{i=1}^{n} p_i log\, p_i$$

Where p denotes the probability of an argument i based on its frequency in the corpus data.

The NOW (News on the Web) corpus "contains 21.6 billion words from web-based newspapers and magazines from 2010 to the present" (Davies 2016-). Since the stimuli used in this experiment will have a narrative, descriptive style, a corpus containing newspaper and magazine texts is a good fit. It is freely available online at English-Corpora.org (www.english-corpora.org) and easily queryable. Also, unlike the Corpus of Contemporary American English (COCA) (Davies 2008) it contains more than just American English texts, which is significant because no specific predictions are made in this proposal relating to dialect of English.

6. DISCUSSION

Two predictions were made in this proposal. The first prediction is that there will be higher grammaticality scores in the 'With context' conditions than in the 'Without context' conditions. This is because the framework adopted by this proposal analyses generics as expressing certain verbal arguments 'implicitly' through the context/discourse; when the context is not felicitious enough, some participants may fail to recover the implicit argument and will then give a lower grammaticality rating because the sentence lacks a required argument.

The second prediction is that target verbs with lower set entropies (calculated based on the frequencies of their internal/external arguments, extracted from a corpus) will have higher grammaticality ratings in the 'Without context' conditions. In other words, a correlation between grammaticality rating and entropy is predicted, specifically when the context is not particularly felicitous.

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This is because set entropy is thought to affect the speed and ease at which mental representations (e.g. of words) are retrieved, from a set of possible candidates, with lower entropy being associated with higher retrieval speeds because less activation is required to retrieve the most frequent candidate (Kostic 1995). When contexts are infelicitous, it is less clear which candidate should be retrieved, making the most frequent candidate(s) the most likely choices. If retrieval is too slow, or difficult, participants may judge a sentence as ungrammatical since they cannot recover the implicit argument. But in cases where retrieval is fast and easy enough, predicted for verbs with low set entropy, a better rating might be given.

If the study described here is undertaken and these predictions borne out, it would provide empirical support for the monotonicity condition on generic constructions and elucidate the role played by pragmatic inference and lexical access in judging grammaticality. As argued in this proposal, a significant class of generic constructions may be constrained not by syntactic principles but by pragmatic ones, which are themselves governed by cognitive limitations. Although the point of this paper is not to argue directly for or against specific syntax-based explanations, the predicted findings could shed light on the aspects of the possible interface between syntax and the rest of cognition. An information theory framework would be a fruitful way to further pursue this line of research.

7. CONCLUSION

Generic constructions are challenging for formal semantics and syntax to handle because, according to the view supported in this paper, they are highly constrained by discourse. Thus, purely syntactic/semantic principles may not be enough by themselves to entirely capture the grammaticality of generics. Conversely, pragmatic theory, incorporating an information theory framework, may be better suited for the task, as this research proposal seeks to show. The other useful consequence of this proposal, if its predictions are borne out, is that it would showcase a more naturalistic way to apply probabilistic pragmatic models (e.g. the RSA framework) to comprehension performance, supporting the use of corpus data in future research on similar topics.

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ON THE NOMINAL PROFORM TYPOLOGY: EMPIRICAL SUPPORT FROM MODERN HEBREW[1]

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ABSTRACT

In this paper, I show that the categorical status of third-person pronouns in Modern Hebrew is heterogeneous. While pronouns are traditionally thought to be a uniform syntactic object, previous research suggests they can differ significantly in their internal structure and syntactic behavior. Building on Déchaine and Wiltschko's (2002) proposal that pronouns come in three structural sizes—each associated with a distinct categorical identity, namely pro-DP, pro-φP, and pro-NP—I apply their diagnostics to a range of Hebrew third-person pronominals, including *pro* (null subject). Specifically, Hebrew serves as a useful testing ground for this framework due to its partial pro-drop pattern and diverse third-person pronominal system. Based on these diagnostics, I propose that Hebrew third-person pronouns do not correspond to a single syntactic category, but instead split into three distinct categorical identities, forming the following tripartition: pro-DPs, pro-φPs, and simplex φs. The latter, a minimal φ-expression, lacks overt structure while still functioning pronominally via φ-feature specification alone. These findings support the idea that pronominal forms differ categorically even within the same person subclass and offer new empirical support for the necessity of a categorical distinction within the pronominal system in natural language.

Keywords: 3rd person pronoun, partial pro-drop, DP-syntax, categorical heterogeneity, binding theory.

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1. INTRODUCTION

A peculiar property of pronouns in natural language is their ability to refer to different discourse entities. However, despite their shared referential function and their ability to substitute noun phrases, pronouns are internally heterogeneous. This raises the question of whether they correspond to a uniform syntactic object that bears the same categorical identity, given the complexity of their internal structure. Pronouns typically fall into three subclasses: first-, second-, and third- person. Research on genetically unrelated languages has shown a substantial contrast between first/second-person pronouns and third-person ones (cf. Moravcsik, 1978). The former consistently refer to discourse participants (speaker, hearer), while the latter can refer to any individual in the discourse domain (Ritter, 1995; Harley & Ritter, 2002). This contrast has been given a syntactic account: unlike first/second-person pronouns, third-person pronouns are often analyzed as lacking a fully specified [Person] feature, instead bearing an unvalued or underspecified [Person] (see Benveniste, 1966; D'Alessandro & Roberts, 2010;

Déchaine & Wiltschko, 2002; Kayne, 2000, 2005; Nevins, 2011; Preminger, 2014; Terenghi, 2023). These differences in referential anchoring and feature specification invite a closer look at the structural and categorical status of pronouns—especially 3rd-person ones.

In this paper, I argue that 3rd-person pronouns do not form a uniform syntactic category. While some analyses treat all pronouns as DPs (Abney, 1987), others argue for structural variation within DP (Cardinaletti, 1994; Ritter, 1995; Noguchi, 1997). However, it remains unclear how external syntax (e.g., c-selection) can distinguish pronouns if they all bear the same categorical identity of a DP.

Other work suggests that pronouns differ in their level of structural deficiency, which is reflected in their maximal projection (Cardinaletti & Starke, 1999; Harley & Ritter, 2002). For instance, Cardinaletti and Starke (1999) link morphological complexity to structural richness. Déchaine and Wiltschko (they will from now on be referred as D&W, 2002) build on this idea, proposing a three-way categorical distinction of pronouns, namely, pro-DP, pro-φP, pro-NP, which correlate with different distributional effects.

Importantly, D&W (2002) make two key predictions: (a) pronouns can be categorically distinguished not only across person subclasses (e.g., 1st/2nd vs. 3rd) but also within a single subclass (e.g., among 3rd-person forms) and (b) this categorization is predicted to extend to other nominal types, such as *pro* in null subject languages. As will become evident, a language that can serve as a suitable testing ground for these predictions is Modern Hebrew. It contains a partial pro-drop pattern and a complex inventory of 3rd-person pronouns.

This paper applies D&W's (2002) diagnostics to a cluster of Hebrew third-person forms, including *pro*. The central question is whether these forms represent distinct syntactic categories. As the analysis shows, Hebrew confirms D&W's (2002) predictions. 3rd-person pronouns in Hebrew do not correspond to a single category but instead fall into three distinct categorical identities, exhibiting the following tripartition: pro-DPs, pro-φPs, and simplex φs. The latter, a simplex φ0, is the most structurally deficient: elements with no overt structure that still function pronominally via φ-feature specification alone.

This research contributes to the broader discussion on pronominal categorization by offering empirical support from Hebrew for the necessity to distinguish between structurally distinct pronominal subclasses. The paper is organized as follows: Section 2 reviews prior analyses that treat pronouns uniformly as DPs. Section 3 presents D&W's (2002) diagnostics and applies them to the Hebrew data. Section 4 concludes with key findings and directions for future research.

2. THEORETICAL BACKGROUND

2.1 DP as a uniform category

According to Abney's (1987) analysis, pronouns are reanalyzed as determiners. Specifically, a pronoun is uniformly a DP that contains the single functional head D0. The hypothesis that pronouns are Ds themselves leads to the prediction that they should appear in complementary distribution with other determiners. This is indeed the case as shown by the following ungrammaticalities:

(1)
a. 1st person: **the I* / **the we*
b. 2nd person: **the you*
c. 3rd person: **the he* / **the she* / **the it* / **the they*
d. Demonstratives: **the this* / **the that* / **the these* / **the those*

While the complementary distribution pattern observed in (1) is characteristic of English, other languages exhibit different patterns between their determiners and pronouns. Indeed, one such pattern is found in Hebrew. Ritter (1995) observes that only 1st and 2nd person pronouns are in complementary distribution with the Hebrew definite D0 *ha* 'the' as shown in (2a-b). However, 3rd-(im)personal pronouns can co-occur with *ha* to form remote demonstratives in (2c) and proximate demonstratives in (2d). Thus, no complementary distribution is observed between the determiner *ha* and these pronoun types. The full paradigm of the nominative forms of Hebrew (im)personal pronouns is given in Table 1 and Table 2.[2]

(2)
a. **ha-ani* / **ha-anaxnu*
the-I / the-we
b. **ha-ata* / **ha-at* / **ha-atem* / **ha-aten*
the-you.M.SG / the-you.F.SG / the-you.M.PL / the you.F.PL
c. *ha-hu* / *ha-hi* / *ha-hem* / *ha-hen*
the-he / the-she / the-they.M.PL / the-they.F.PL
that(m) / that(f) / those(m) / those(f)
d. *ha-ze* / *ha-zot* / *ha-ele*
the-it.M.SG / the-it.F.SG / the-it.PL
this(m) / this(f) / these

Ritter (1995) argues that these facts provide support for structural differences internal to the DP projection. That is, 1st and 2nd pronouns are DPs that contain the single functional head D0 as in (2a). On the contrary, 3rd (im)personal pronouns are not Ds themselves as they are not in complementary distribution with *ha*. Rather, they belong to the functional category Num0 (see Ritter, 1991 for discussion).

Given the NumP projection, the internal structure of third-person (im)personal demonstratives from (2c-d) is the result of combining the pronominal element in Num0 with the definite article in D0. Thus, both D0 and Num0 are realized overtly as in Figure 2. As for third-person non-demonstratives, Ritter (1995) assumes that they are also of category DP, but in this case, D0 is null phonetically (see Figure 3). Crucially, under Ritter's (1995) analysis, all Hebrew pronouns are uniformly of category DP containing internal structural nuances, as illustrated in Figures 1-3.

A similar uniform account is proposed by Noguchi (1997), where a cross-linguistic comparison is made between Japanese and English pronouns. Specifically, the analysis is based on the observation that Japanese pronouns cannot participate in bound variable anaphora even though they can be co-referential with another R-expression.

For example, the Japanese personal pronoun *kanozye* 'she' cannot function as a variable bound by an operator in (3a). The only accessible interpretation of this pronoun is when it is co-referential with an R-expression in (3b). This is in sharp contrast to English pronouns that can participate both in bound variable anaphora and co-reference (see translations in (3)).

(3)
a. **Dono zyosei$_i$-mo* [*kanozyo$_i$-ga tensai-da*
every woman-also she-NOM genius-COP
to] *omotte-iru.*
COMP think-PRS
'Every woman$_i$ thinks that she$_i$ is a genius.'

b. *Mary$_i$-ga* [*kanozyoi-ga tensai-da* *to*]
Mary-NOM she-NOM genius-COP COMP
omotte-iru.
think-PRS
'Mary$_i$ thinks that she$_i$ is a genius.'

(Noguchi, 1997, p. 770)

Based on these facts, Noguchi (1997) argues that English pronouns can exhibit both binding and co-reference, whereas Japanese pronouns only

Table 1
Hebrew personal pronouns

	SINGULAR		PLURAL	
	MASCULINE	FEMININE	MASCULINE	FEMININE
1st	ani		anaxnu	
2nd	ata	at	atem	aten
3rd	hu	hi	hem	hen

Table 2
Hebrew impersonal pronouns

SINGULAR		PLURAL
MASCULINE	FEMININE	
ze	zot	ele

Figure 1

1st/2nd pronouns

Figure 2

3rd person demonstratives

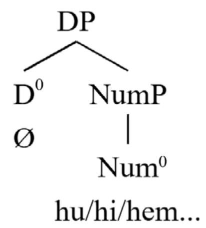


Figure 3

3rd person non-demonstratives

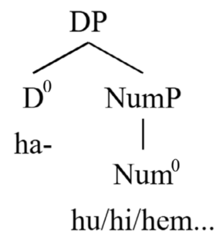


exhibit co-reference effects. Therefore, Noguchi (1997) concludes that when a pronoun is part of both binding and co-reference, it is of category D^0. However, when a pronoun is only part of co-reference, it is of category N. Thus, it follows that Japanese pronouns are N-pronouns, whereas English pronouns are D-pronouns as Noguchi (1997, p. 783) proposes in Figure 4.

Importantly, Noguchi's (1997) distinction is only within the DP projection and is not reflected in the maximal projection as both pronoun types bear the same categorical identity of a DP regardless of their internal nuances.

2.2 D&W's framework

As opposed to the analyses I presented in the previous section that treat pronouns uniformly as DPs, D&W (2002) propose three different pronoun types that are distinguished categorically, namely pro-DPs, pro-φPs, pro-NPs. These pronoun types do not correspond to a uniform syntactic category. Instead, they are all associated with a different structure as shown in Figures 5-7. D&W (2002) predict that these phrase structures are distinct from each other based on their proposed pronominal diagnostics. Namely, the categorical status of each pronominal category (pro-DPs/φPs/NPs) determines its external syntax and semantics, which in turn, dictates its binding-theoretic status as summarized in Table 3.

Specifically, this framework predicts that a pro-DP exhibits the syntax of a determiner phrase (henceforth D-syntax) and embeds in it the other two subconstituents, namely, pro-φP and pro-NP. Under the assumption that DPs can only be arguments (cf. Stowell 1989, Longobardi 1994), it is also predicted that they will appear in argument positions. In addition, their semantics is expected to be definite, which entails their ability to function as R-expressions. As such, they are subject to Condition C of binding theory. The two relevant binding conditions are given in (4).

Binding Conditions (simplified):

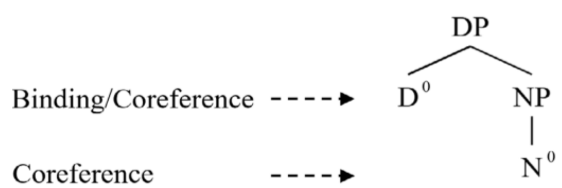
Condition B: a pronoun must be free in its binding domain.

Condition C: an R-expression must be free.

(Chomsky, 1986, p. 166)

Figure 4

Japanese pronouns as DPs



Pro-φPs, on the other hand, are predicted to lack both D-syntax and the syntax of nouns (henceforth N-syntax). Furthermore, there is no restriction on their distribution, namely, they can function both as arguments and/or predicates. As for their semantics, pro-φPs simply spell out φ-features and thus lack inherent semantics. Under binding theory, they function as a variable and therefore behave like Condition B pronouns. They are also expected to contain in their internal structure an NP as a subconstituent.

The last pronominal bears the categorical identity of a pro-NP. It is expected to behave syntactically as a predicate and semantically as a constant. Its binding status is undefined.[3]

2.3. The adopted framework

Previous analyses have focused primarily on the internal structure of different pronoun types while maintaining a uniform categorical identity, namely DPs. A representative example is Ritter (1995), who analyzes Hebrew pronouns within the DP projection, distinguishing them based on internal functional structure. However, classifying different pronominal

Figure 5

pro-DP

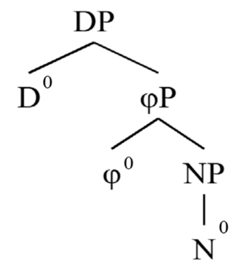


Figure 6

pro-φP

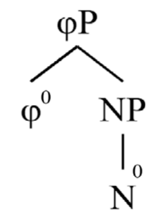
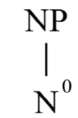


Figure 7

pro-NP



types uniformly as DPs makes it difficult to account for variation in their external syntax and binding behavior. This limitation motivates the need for a system that generates distinct categorical identities for different pronominal subclasses.

It is precisely this kind of system that is predicted by D&W's (2002) framework. Therefore, in this paper, I adopt their pronominal diagnostics to examine Hebrew pronouns categorically and reinterpret Ritter's (1995) descriptive results through the lens of this framework. Specifically, I test whether the class of Hebrew third-person pronouns corresponds to different categorical identities. In doing so, this class is divided into three distinct subclasses, each predicted to instantiate a distinct categorical status: demonstratives, non-demonstratives, and pro. Importantly, Hebrew exhibits a partial pro-drop pattern and presents a complex inventory of 3rd-person pronouns, making it an ideal language to test the two key predictions of D&W (2002): (a) pronouns can be categorically distinguished within the same pronominal class, and (b) the framework can extend to other nominal types, such as pro.

In the next section, I present a reanalysis of the three subclasses under D&W's (2002) framework and demonstrate that these two predictions are borne out. Hebrew 3rd-person pronouns are shown to be categorically heterogeneous.

Table 3

Pro-frm typology

CATEGORY	PRO-DP	PRO-φP	PRO-NP
Internal syntax	D-syntax	neither D nor N-syntax	N-syntax
Distribution	argument	argument or predicate	predicate
Semantics	definite	lack inherent semantics	constants
Binding-theoretic status	subject to Condition C	subject to Condition B	undefined

3. REANALYSIS

3.1 Pro-DPs: 3rd person demonstrative pronouns

Following Ritter (1995), I propose that demonstratives derived by the co-occurrence of 3rd-person pronouns with the determiner ha are to be analyzed as DPs under D&W's (2002) framework. As a DP, these demonstratives are expected to have a D-syntax. Their D-syntax is illustrated in (5) where the demonstrative phrase is preceded by the Hebrew overt accusative case marker et. As noted by Ritter (1995), this accusative case-marker only emerges with a definite DP. This is shown in (6).

(5)

anaʃim harg-u [*et* *ha-hem*] *ʃe-lavʃ-u*
people kill.PST-3PL ACC the-they that-wear.PST-3PL
kova.
hat
'People killed those that wore a hat.'

(6)

a. *'anaʃim harg-u* [*et ha-baxur-im*]
people kill.PST-3PL ACC the-guy-PL.M
ʃe-lavʃ-u *kova.*
that-wear.PST-3PL hat

'People killed the guys that wore a hat.'

b. *'anaʃim harg-u [ha-baxur-im] ʃe-lavʃ-u
people kill.PST-3PL the-guy-PL.M that-wear.PST-3PL
kova.
hat

These facts show that the internal syntax of such 3rd-person demonstratives is that of a D. To show that their syntax is only that of a D, I provide the examples in (7) that illustrate that these demonstratives do not have an N-like syntax. Specifically, whereas a noun is found in an object position as in (7a), a demonstrative pronoun occupying the same position leads to ungrammaticality as in (7b). To make (7b) grammatical, the accusative case marker *et* must be inserted as in (5).

(7)
a. *'anaʃim harg-u [baxur-im] ʃe-lavʃ-u*
people kill.PST-3PL guy-PL.M that-wear.PST-3PL
kova.
hat
'People killed guys that wore a hat.'

b. *'anaʃim harg-u [ha-hem] ʃe-lavʃ-u*
people kill.PST-3PL the-they that-wear.PST-3PL
kova.
hat

As for their distribution, the examples in (8) establish that 3rd-person demonstratives can function only as arguments. Forcing them to function as predicates leads to ungrammaticality as evident in (8b).

(8)
a. [*ha-hu*]$_{ARG}$ *xibek* [*et ha-hi*]$_{ARG}$
the-he hug.PST.3SG.M ACC the-she
'That one hugged that one'.

b. **ha-ʃoter haya* [*ha-hu*]$_{PRED}$
the-policeman be.PST.3SG.M the-HE

Given these facts, I conclude that third-person demonstratives are only arguments. As for their semantics, they are expected to be definite and thus behave like R-expressions. As such, they must be sensitive to condition C of binding theory. Indeed, (9) shows that they behave like R-expressions and thus exhibit condition C effects across clausal boundaries (9a) and within clausal boundaries (9b).

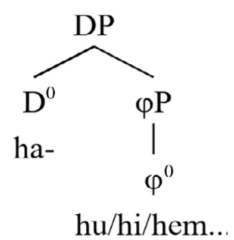
(9)
a. **Lucy 'amr-a le-*[*Ron*]$_k$ [*CP ʃe-*[*ha-hu*]$_k$
Lucy tell.PST-3SG.F TO-Ron that-the-he
hicliax
succeed.PST.3SG.M
'Lucy told Ron$_k$ that [*that one*]$_k$ succeeded in the exam.'

b. *[*ha-jeled*]$_k$ *xibek* [*et ha-hu*]$_k$
the-boy hug.PST.3SG.M ACC the-he
'The boy$_k$ hugged [that one]$_k$.'

To conclude, 3rd-person demonstratives in Hebrew show all the properties of full DPs under D&W's (2002) diagnostics. Therefore, I conclude that they are pro-DPs. Their structure is given in Figure 8.[4]

Figure 8

3rd person demonstratives as DPs



3.2 Pro-φPs: 3rd person non-demonstratives

If 3rd-person pronouns were Ds themselves, we would never expect to find them as complements of the D *ha-* 'the' to form demonstratives. Thus, the fact that 3rd-person pronouns are not in complementary distribution with *ha-* suggests that they do not have a D-syntax.

Furthermore, Hebrew 3rd-person pronouns do not appear to have N-syntax. Specifically, they are found in positions that are typically not occupied by nouns. Hebrew so-called verbless present tense sentences with a pronominal copular show exactly that. Both Doron (1983) and Rapoport (1987) analyze the pronominal copular in these constructions as the spell-out of agreement, namely, they bear the same φ-features as the subject, as shown in (10). Importantly, only 3rd-person pronouns can function as the pronominal copular. Nouns, on the other hand, cannot be used in the same way. This

is evident from the contrast between the predictive and attributive status of the adjective xaxam-a 'smart' in (10a-c).[5] If 3rd-person pronouns had N-syntax, we would expect them to be able to be modified attributively by the adjective. However, this is not the case as shown in (10a). Thus, I argue that 3rd-person pronouns do not have an N- syntax.

(10)
a. *Lucy hi* [$_{AP}$ *xaxam-a*]*$_{ATTR./PRED}$
Lucy she smart-SG.F
'Lucy is smart.'

b. *Lucy hi talmid-a* [$_{AP}$ *xaxam-a*]$_{ATTR./*PRED}$
Lucy she student-SG.F smart-SG.F
'Lucy is a smart student.'

c. *Lucy talmid-a* [$_{AP}$ *xaxam-a*]$_{ATTR./*PRED}$
Lucy student-SG.F smart-SG.F
'Lucy is a smart student.'

Given these facts, 3rd-person pronouns have neither D-syntax nor N-syntax. Therefore, I reanalyze them as pro-φPs. This is also consistent with their external distribution. Specifically, they can function as either arguments or predicates as illustrated in (11).

(11)
a. [*hu*]$_{ARG}$ *ʃalax le-Ron mixtav*
he send.PST.3SG.M to-Ron letter
'He sent Ron a letter.'

b. *ha-manhig haya* [*hu*]$_{PRED}$
the-leader be.PST.3SG.M he
'The leader was him.'

These facts show a syntactic flexibility inherent to pro-φPs: they can function both as arguments and as predicates. As for their semantics, 3rd-person pronouns lack inherent semantics. Specifically, they spell-out φ-features as illustrated in (10). As such, I predict that they can participate in bound variable readings. This prediction is borne out in (12).

(12)
[*kol talmid*]$_i$ *xoʃev ʃe-*[*hu*]$_i$ *hicliax*
every student think.PRT.SG.M that-he succeed.
PST.3SG.M
'Every student thinks that he succeeded.'
= ∀x, talmid(x), x xoʃev ʃe x hicliax.

Furthermore, 3rd-person pronouns support co-reference as they can be bound outside their local domain:

(13)
[*Lucy 'amr-a le-Ron$_i$* [*CP ʃe-hu$_i$ hicliax*]]
Lucy tell.PST-3SG.F to-Ron that-he succeed.
PST.3SG.M
'Lucy told Ron$_i$ that he$_i$ succeeded in the exam.'

It is the combination of these two properties, the ability to function as bound variables and the ability to support co-reference, which naturally reflects the standard Condition B effect. To sum up, I have established that 3rd-person pronouns illustrate all the properties of pro-φPs. Thus, I argue that they are pro-φPs.

As for the possibility of having overt NPs as subconstituents embedded within pro-φPs, it is indeed possible to find 3rd-person pronouns combining with Ns in Hebrew. This is illustrated in (14) with object pronouns.[6,7]

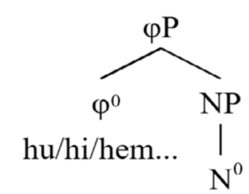
(14)
a. *oto talmid tamid lomed*
him student.SG.M always learn.PRT.SG.M
'(him) student always learns.'

b. *otam talmid-im tamid lomd-im*
them student.PL.M always learn.PRT-PL.M
'(them) students always learn.'

Therefore, I propose that Hebrew 3rd-person pronouns are pro-φPs that can imbed the NP as a subconstituent to provide the range of the additional nominal structure. The full structure of these pro-φPs is given in Figure 9.

Figure 9

3rd person non-demonstatives as φPs



3.3 Simplex φs: 3rd person *pro*

Crucial to the current discussion is the observation that Hebrew is a partial-drop language. Specifically, according to Borer (1981), the availability of null subjects, *pro*, is dictated by the richness of agreement in Hebrew. Specifically, Borer (1981, 1989) observes that null subjects in present tense sentences are impossible in Hebrew as present tense agreement is unspecified for the person feature as evident in (15a-b).

(15)
a. *ani /ata / hu roce bira.*
I.1SG / you.2SG.M / he.3SG.M want.PRS.SG.M beer
'I/you/he want(s) beer.'

b. **pro roce bira.*
Ø want.PRS.SG.M beer

In other cases, it has been observed that in past and future tenses, first and second-person pronouns freely allow null subjects, while 3rd-person pronouns restrict them as evident from (16).

(16)
a. *pro nixφal-ti ba-mivxan*
Ø fail.PST-1SG in+the-test
'(I) failed the test.'

b. *pro nix∫al-ta ba-mivxan*
Ø fail.PST-2SG.M in+the-test
'(You) failed the test.'

c. *hu nix∫al ba-mivxan*
he fail.PST.3SG.M in+the-test
'He failed the test.'

d. **pro nix∫al ba-mivxan*
Ø fail.PST.3SG.M in+the-test
'(He) failed the test.'

(Adapted from Gutman, 2004, p. 464)

Thus, the more restrictive distribution of 3rd-person *pro* suggests that they behave differently from their overt counterparts (i.e., 3rd-person non-demonstratives). Importantly, according to Borer (1989), 3rd-person *pro* is also available in past and future tenses but restricted to the context of a binder. That is, they are possible only in embedded clauses if they have a co-referential (c-commanding) constituent that binds them, as illustrated in (17).

(17)
a. *Talila 'amr-a le-Itamar*$_i$ *∫e-hu*$_i$*/pro*$_i$
TALILA SAY.PST-3SG.F to-Itamar that-he/Ø
hicliax
succeed.PST.3SG.M
'Talila told Itamari that hei succeeded.'

b. *Talila*$_j$ *'amr-a le-Itamar ∫e-hi*$_j$*/pro*$_j$
Talila say.PST-3SG.F to-Itamar that-she/Ø
hiclix-a
succeed.PST-3SG.F
'Talilaj told Itamar that she$_j$ succeeded.'

c. *Talila*$_j$ *'amr-a le-Itamar*$_i$ *∫e-hem*$_k$*/*pro*$_k$
Talila say.PST-3SG.F to-Itamar that-they/Ø
hiclix-u
succeed.PST-3PL
'Talila told Itamar that they succeeded'.

(Adapted from Borer, 1989, p. 93)

Interestingly, Borer (1989) also observes that a split antecedent reading is possible with 3rd-person non-demonstrative pronouns, but impossible with 3rd-person *pro*. This reading is shown in (18).

(18)
a. *Rina*$_i$ *'amr-a le-Ran*$_j$ *φe-hem*$_{i+j}$
Rina say.PST-3SG.F to-Itamar that-they
hiclix-u
succeed.PST-3PL
'Rinai told Ranj that they$_{i+j}$ succeeded'.

b. **Rina*$_i$ *'amr-a le-Ran*$_j$ *∫e-pro*$_{i+j}$
Rina say.PST-3SG.F to-Itamar that-Ø
hiclix-u
succeed.PST-3PL
'Rina told Ran that (they) succeeded.'

(Adapted from Borer, 1989, pp. 95–96)

According to Borer (1989), a property that distinguishes anaphors from pronouns is that the former cannot participate in split antecedent readings as in (18). Therefore, I argue that these facts suggest that 3rd-person *pro* is of a different category than its overt counterpart. Specifically, 3rd-person *pro* seems to function only as an anaphoric element whereas its overt counterpart can be either anaphoric (17a-b) or exophoric (17c).

Crucially, one might argue that 3rd-person *pro* is subject to Condition B as evident from (17a-b). If they were subject to Condition B, we would expect them to exhibit exophoric reference just like its overt counterpart as they must be free in their binding domain in any case. However, (17c) shows that only the overt pronoun can have such reference while with 3rd-person pro it is impossible.

As for its semantics, following Borer (1989), 3rd-person *pro* lacks inherent φ-features specification and thus must acquire its specification through anaphoric agreement from a fully specified c-commanding constituent from the higher clause as in (17). As such, it lacks inherent semantics. Therefore, I predict that they can allow for a bound variable reading. Indeed, this prediction is borne out in (19).

(19)
[kol talmid]$_i$ *xo∫ev ∫e-[pro]*$_i$ *hicliax.*
every student think.PRT.SG.M that-Ø succeed.PST.3SG.M
'Every student thinks that (he) succeeded'
= ∀x, talmid(x), x xo∫ev ∫e x hicliax.

Thus, 3rd-person *pro* is similar to their overt counterpart only in their anaphoric nature as bound variables. The crucial differences are, however, in their distribution that stems from their asymmetric binding-theoretic status and split-antecedent interpretation.

Overall, the facts I presented so far show that the distribution and semantics of third-person pro is more restrictive than that of its overt counterpart, which I reanalyzed as pro-φPs. Therefore, a question that remains open is whether 3rd-person *pro* are also a pro-φP. Since these two subgroups of 3rd-person pronouns, overt and covert, exhibit different patterns, I argue that it is unlikely they both bear a homogenous categorical identity.

A reasonable hypothesis is that 3rd-person pro is not a phrasal element like its overt counterpart, but rather a simplex φ0. One piece of evidence that supports this hypothesis is that 3rd-person *pro* cannot have a split-antecedent reading and thus does not function like a typical pronoun. Rather, it simply represents anaphoric agreement of φ-features.

Another supportive piece of evidence comes from the way pro acquires its φ-features specification in embedded clauses. Following Borer (1989), 3rd-person *pro* must raise to C0, a position in which it can be bound by a nominal element from the higher clause, to inherit its φ-features specification. Under this scenario, pro must undergo a head movement (rather than a full phrasal movement) to the head position C0 to anaphorically acquire its specification. The precise behavior and characterization of this simplex φ0, however, remain open for further research.

To summarize, I showed that 3rd-person pro is not completely analogous to its overt counterpart based on distributional differences. I then concluded that these differences indicate that they do not have the same categorical identity. Therefore, I propose to classify third-person pro as a simplex φ0 (see Figure 10).

Figure 10

3rd person pro as φ0

3.4 Summary

In previous sections, I have established that the complex third-person pronominal group in Hebrew is heterogeneous categorically. Specifically, I reanalyzed 3rd-person demonstratives as pro-DPs, 3rd-person non-demonstratives as pro-φPs, and 3rd-person pro as simplex φs. Their structure is given in Figures 11-13.

4. CONCLUDING REMARKS

In this paper, I investigated whether the complex Hebrew 3rd-person pronominal group exhibits a heterogeneous categorical identity. To provide an answer to this question, I adopted D&W's (2002) diagnostics of pronouns. This categorical distinction proved to be effective in showing that the subgroups of Hebrew 3rd-person pronominals do not have the same categorical identity. Specifically, I reanalyzed

Figure 11

3rd person demonstratives

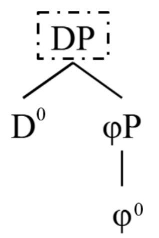


Figure 12

3rd person non- demonstratives

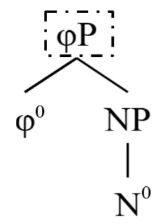


Figure 13

3rd person pro

third-person demonstrative pronouns as pro-DPs, non-demonstratives as pro-φPs, and *pro* as simplex φ0. These findings confirm the hypothesis that pronouns do not correspond to a uniform syntactic object.

Further research should consider two lines of inquiry. First, additional work should examine the syntactic behavior and distribution of 3rd-person pro as simplex φs. Second, while this paper focused on syntactic variation within Hebrew, future research should expand the analysis cross-linguistically, for example, by comparing Hebrew to languages with similar partial pro-drop patterns. Interestingly, Hebrew has been shown to share this restricted pro-drop pattern in third-person with genetically unrelated languages such as Finnish, Brazilian Portuguese, Russian, and Marathi (Gutman, 2004; Barbosa, 2011). These directions would enrich our understanding of syntactic variation and pronominal diversity in human language.

FOOTNOTES

1. Parts of this article were presented at the LOT Summer School in Leiden (2024). I would like to thank Astrid van Alem for her valuable comments on an earlier version of this manuscript. I am also grateful to Roberta D'Alessandro for her helpful comments and suggestions, and to Michelle Sheehan and Malte Zimmermann for insightful discussions that informed the development of this article. I also thank three anonymous reviewers for their constructive comments and suggestions. All remaining errors are my own.

2. Two anonymous reviewers noted the importance of presenting a fuller picture of Hebrew agreement patterns across different modalities (e.g., tense, plurality, etc.). One reviewer suspected that Hebrew exhibits agglutination; however, Hebrew, as a Semitic language, does not exhibit agglutination in the typical sense. Rather, it employs nonconcatenative morphology, where consonantal roots are merged into vocalic templates, which in turn encodes φ-features and T/A/M conditions. To support readers unfamiliar with Hebrew, the full nominative paradigm is presented here. Due to space limitations, only the forms relevant to the analysis are illustrated in the main text and counterexamples are explicitly addressed when relevant. For a broader overview of Hebrew agreement morphology and clausal architecture, see Shlonsky (1997) and Berman and Bolozky (1978). A more detailed paradigm is available from the author upon request.

3. Déchaine & Wiltschko (2002) classify the Japanese pronoun kare 'he' as a pro-NP, based on parameters in Table 3. However, pro-NPs are not relevant to the current analysis since the Hebrew data examined in this paper do not instantiate this type of pronominal structure.

4. The Hebrew data I have considered in this analysis did not show evidence for having NPs as subconstituents under third-person demonstratives as pro-DPs, like in the structures in Figure 5. Therefore, I excluded them from the structure in Figure 8. Whether Hebrew pronouns allow these embedded NPs in pro-DPs is a question I leave open for further research.

5. This is consistent across all pronominal modalities, namely, in both singular and plural, as well as masculine and feminine forms. For a detailed discussion, see Doron (1983) and Rapoport (1987).

6. The Hebrew object pronouns in 3rd-person can also have another reading of identicality, viz., meaning 'the same'. However, the readings in (14) are somewhat similar to the interpretation of 3rd person plural them in some varieties of American English as in [them linguists] are happy. See Déchaine & Wiltschko (2002) for more discussion.

7. Again, the examples in (14) are a subset of a larger pattern that is consistent with the current analysis. For a comprehensive paradigm of Hebrew object pronouns, see Berman (1978).

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