

Research Summary Report

Competition №34/02

David Potter

Overview

In my research program, I explore how a speaker's linguistic knowledge interacts with how we produce and comprehend language. I aim to produce formal theories of the broader human language faculty that are founded on cross-linguistic, experimental, and psycholinguistic evidence. Empirically, I focus on the nature of long-distance dependencies, locality constraints on these dependencies, and their interaction with prosodic and information structural phenomena. The key finding of this program is that, while the parser is sensitive to fine-grained grammatical properties, including the structural representation of information structure, the locality constraints known as islands are generally the result not of constraints on processing but rather structural and interpretational constraints.

Non-Local Dependencies and Tree Adjoining Grammars

In my early work as an MA student at Simon Fraser University, I was interested in how a mathematically precise formalism could be used to provide insights into the nature of the syntax/semantics interface and long-distance dependencies. In collaboration with Dr. Chung-hye Han and Dr. Dennis Storoshenko, I examined the syntax and semantics of several non-local dependency constructions including *Coordinate Structures* (1a), *Right Node Raising* (1b), *Across-the-board Movement* (1c), and *reflexives* (1d) (Han et al., 2008; Storoshenko et al., 2008; Han et al., 2010; Potter, 2010c,b). I also examined the syntax of multiple *wh*-fronting phenomena in Slavic languages (Potter, 2008). This line of inquiry demonstrated that many of the properties of non-local dependencies can be shown to follow from variants of a Lexicalized Tree Adjoining Grammar (Frank, 2004), rather than from stipulations on generative capacity.

- (1) a. A student likes and takes every course. (Coordinate Structure)
- b. John though you paid, and Tim insisted that you didn't pay, the rent. (RNR)
- c. Which bill did John think you paid and did Tim insist that you didn't pay? (ATB movement)
- d. Jim introduces Bill to himself. (Reflexives)

Cross-linguistic analysis and empirical experimental evidence

At this time, I began to become interested in two lines of inquiry that would become key to my current research program: cross-linguistic comparisons and experimental methodologies. In 2010, I first began examining the syntax of the ellipsis construction known as *Gapping*, to which I would later return, and argued, on the basis of data from Persian, that the then influential analysis of these constructions in terms of Across-the-board Movement could not account for the Persian data (Potter, 2010a). Instead, the data argued in favor of Gapping constructions as a clausal coordinate structures in combination with an ellipsis mechanism.

In 2010, I also took my first steps towards working with experimental syntax. With Dr. Nancy Hedberg, we examined the syntax of copular constructions in Thai (Hedberg and Potter, 2010). On the basis of experimental evidence, we argued that the distribution of the so-called *Equative Copula* in Thai supports a cross-linguistic analysis of specificational copular constructions as derived not from predicative structures, but from equative copular structures.

Theoretical Syntax: Gapping and Related Constructions

After completion of my Master’s degree, I moved to pursue my PhD at Northwestern University. During this time, I first focused on developing a theoretical analysis of various types of related ellipsis constructions, working closely with Dr. Masaya Yoshida, Dr. Michael Frazier, and Dr. Honglei Wong. I then returned to my interest in using experimental empirical methodologies in support of formal syntactic and psycholinguistic analysis.

With Dr. Yoshida and Dr. Wong, I examined the distribution of Gapping-like constructions in nominal coordinate structures (2), (Wang et al., 2011b,a; Yoshida et al., 2012). We argued that the Across-the-board movement analysis proposed for verbal Gapping cannot account for Gapping in the nominal domain, and instead argue in favor of an ellipsis analysis of these constructions.

- (2) John read Bill’s book of poems, and Mary’s of poetry.

With Dr. Yoshida and Dr. Frazier, we explored verbal Gapping and what we argue to be a related construction, Pseudo-Noun-Phrase Coordination. This work was presented at a number of high-profile international conferences (Frazier et al., 2012; Potter et al., 2013; Potter, 2014; Potter et al., 2015), and culminated in an article published in *Natural Language and Linguistic Theory* (Potter et al., 2017). Our principal claim is that Gapping, and related, constructions, (3a), are ambiguous between clausal and VP coordinate structures, e.g. (3b-3c). This analysis correctly captures the systematic ambiguity of certain scopal elements in Gapping constructions, and makes a series of novel predictions concerning the distribution of these ambiguities. Further, this analysis suggests that the puzzling properties of Gapping that set it apart from other elliptical constructions are likely to result from the syntactic correlates of their information structural properties, rather than an independent Gapping-specific property.

- (3) a. James didn’t eat beans or Mary rice.
b. [_{CP} James didn’t eat beans] or [_{CP} Mary_i rice_j ~~t_i didn’t eat t_j~~]
c. James didn’t [[_{vP} eat beans] or [_{vP} Mary_i rice_j ~~t_i eat t_j~~]]

Wh-dependencies and Sentence Processing

Alongside this theoretical work on the syntax of ellipsis, I began to explore my interest in the relationship between the grammar and the human language processing system in a multi-year project in collaboration with Dr. Yoshida, Dr. Frazier, Dr. Lauren Ackerman, and Peter Baumann. This work was presented at the two premier international sentence-processing and psycholinguistics conferences, AMLaP (Frazier et al., 2013, 2014b) and CUNY (Frazier et al., 2014a, 2015b), and was ultimately published as a journal article (Frazier et al., 2015a). We were interested in whether the resolution of a reflexive-antecedent dependency was sensitive to a filler-gap dependency, using a gender mismatch paradigm with eye-tracking while reading measures. In sentences like (4), we found a gender mismatch effect only for the head of the *wh*-filler-gap dependency, and not for the linearly closer, and locally possible, but globally inaccessible, antecedent *Mary/John*. We took these results to indicate that *wh*-filler-gap dependencies are resolved online and that the parser makes use of fine-grained syntactic information, such as the location of the gap, during on-line sentence processing.

- (4) Which cowgirl did Mary/John expect _ to have injured herself/himself due to negligence?

Stripping and Island work

I then returned to my interest in ellipsis constructions, and began to explore how these constructions can shed light on the constraints on long-distance dependencies known as *islands*. Using formal experimental techniques, I showed that non-contrastive Stripping, e.g. (5), completely ameliorates definite relative clause island effects, while contrastive Stripping, e.g. (6), only *partially* ameliorates them (Potter, 2016, 2017; Potter and Carlson, 2019c,d). The partial amelioration of island constraints by ellipsis was a novel finding; prior discussion of amelioration effects generally take the amelioration

to be complete, where it does apply. These findings raise new and interesting questions about island effects and why ellipsis should ameliorate them. This partial island sensitivity I attributed to a garden path effect: the ambiguous information structure of the antecedent in these constructions leads to a misparse of the antecedent. This confounding garden path is likely the source of the uneven judgments reported in the literature concerning the island (in)sensitivity of contrastive ellipsis. Thus, this work demonstrates that careful experimental work is crucial in controlling for confounding factors.

- (5) Non-Contrastive Stripping
 - a. A: Peter appreciated the student who studied a middle-eastern language.
 - b. B: Yeah, Turkish.
- (6) Contrastive (Corrective and Elaborative) Stripping
 - a. A: Peter appreciated the student who studied Arabic.
 - b. B: No, Turkish.
 - c. B: Yeah, and also Turkish.

In recently published work with Dr. Tim Hunter, and Dr. Yoshida, we argue, on the basis of experimental results using Binding Condition C manipulations, argued against the so-called “Evasion Approaches” to ellipsis island amelioration. Ellipsis genuinely *repairs* island violations (Hunter and Potter, 2016; Potter, 2017; Yoshida et al., 2019). Ongoing work extends this line of research to other types of islands, including subject islands, which show complete amelioration under ellipsis, and factive islands, which show no ellipsis amelioration effect at all (Potter and Carlson, 2019b; Potter, 2019a,b). Preliminary cross-linguistic research, described below, shows that Stripping in Turkish also ameliorates relative clause and adjunct clause islands (Potter and Görgülü, 2020). Taken together, these results suggest that definite relative clause and subject islands, but not factive islands, result from PF-interface constraints.

Prosody and Sentence Processing

After completion of my PhD at Northwestern, I began a position as a post-doctoral research associate for Dr. Katy Carlson. In addition to continuing my research on ellipsis and island effects, Dr. Carlson and I examined the interaction of prosody, information structure, and sentence processing. In this line of work, we show that various cues for focus, including pitch accents, question-answer congruence, and focus sensitive operators, attract ambiguously attached modifiers. A pitch accent on either the matrix or embedded verbs in (7a) will draw the attachment of the ambiguously attached modifier *on Monday*, with more high attachment interpretations, (7b), with a high pitch accent, and more low attachment interpretations (7c), with a low pitch accent. We argue that this attraction is due to the linguistic properties of the focus cued by the pitch accent, rather than the result of the salience associated with it (Potter and Carlson, 2018, 2019a; Carlson and Potter, 2020).

- (7) a. James said that Mary arrived on Monday.
- b. James said, on Monday, that Mary arrived.
- c. James said that, on Monday, Mary arrived.

The key insight is that the information structure of an utterance can be cued, and constrained by, various grammatical constructions and prosodic features, including not just pitch accents, but also question-answer congruence, (8), and focus sensitive operators, (9, 10). We show that these various cues for focus attract ambiguously attached modifiers.

- (8) a. What did Paula do? (VP focus question)
- b. Who did Paula phone? (Noun focus question)
- c. Paula phoned a friend from Alabama.
- d. Paula phoned from Alabama to reach a friend.
 (High attachment interpretation)

- e. The friend who Paula phoned was from Alabama.
(Low attachment interpretation)
- (9) a. James only said that Mary arrived on Monday.
b. James said that Mary only arrived on Monday.
- (10) a. James only SAID that Mary arrived on Monday.
b. James only said that Mary ARRIVED on Monday.

Crucially, when multiple cues are present, as in (10), the modifier is attracted to the focus sensitive operator itself, rather than to the position of the acoustically salient pitch accent. If the focus in such instances is associated directly with the focus sensitive operator itself, this suggests that the impact of information structure on sentence processing is properly characterized by linguistic structures interacting with parsing heuristics, rather than by cognition general attentional mechanisms.

Ongoing work combines this thread of research with my interest in ellipsis to examine how information structural cues impact the interpretation of various focus sensitive operators in ambiguous elliptical constructions, as illustrated in (11). We found that the location of a focus cue in the antecedents (11a-11b) influences how the Stripping continuation is interpreted: a high focus cue, (11a), leads to more high negation interpretations (11c), while a low focus cue leads to more low negation interpretations (11d). The impact of focus holds not only for non-island structures, but structures in which the ellipsis antecedent contains an island as well, (12). These results again suggest that the ellipsis site in such island-violating continuations contain structure that is isomorphic to the antecedent and therefore that an evasion approach to the ellipsis island amelioration effect is inadequate. Rather, these results corroborate the findings of my previous research: ellipsis genuinely repairs at least some types of island violations.

- (11) a. James DID say that Mary called Bill, and not Alex.
b. James said that Mary DID call Bill, and not Alex.
c. ...and James didn't say that Mary called Alex.
d. ...and James said that Mary didn't call Alex.
- (12) a. James DID meet the student who called Bill, and not Alex.
b. James met the student who DID call Bill, and not Alex.
c. ...and James didn't meet the student who called Alex.
d. ...and James met the student who didn't call Alex.

Return to cross-linguistic experimental research

My long term research program, as described in the accompanying research proposal, involves the extension of my experimental investigations into island effects to languages beyond English. To that end, I have begun three collaborative projects. In one project, with collaborator Dr. Emrah Görgülü, at Istanbul Sabahattin Zaim University, we examine the island sensitivity of various types of ellipsis in Turkish. In a talk presented at the 15th Workshop on Altaic Formal Linguistics, we provide intuitional evidence that various elliptical constructions in Turkish ameliorate relative clause and adjunct clause islands, (Potter and Görgülü, 2020). In the summer of 2020, we will test these claims experimentally and extend the study to other types of island and elliptical constructions in Turkish.

With Dr. Yoshida, Dr. Görgülü, and Hyosik Kim, a graduate student at Northwestern University, we are examining the possibility that island effects surface even in the absence of overt movement. English permits so called *wh*-in-situ constructions in a limited range of contexts, such as in echo-questions (13). Other languages employ *wh*-in-situ constructions much more broadly. The theoretical literature has claimed that such constructions, in the absence of overt movement, show island effects only in the case that the relevant *wh*-phrase is an adjunct; in-situ argument *wh*-phrases have been claimed to be immune to island effects. However, recent experimental evidence on *wh*-in-situ in Mandarin Chinese suggests that island constraints do indeed impact even argument in-situ *wh*-phrases

(Lu et al., 2019). In this project we are extending this line of investigation to Turkish, Korean, Japanese, and English, to examine if there is an island effect of in-situ elements and if this effect is as large with in-situ elements as for overtly moved elements. The results will speak directly to the role that overt movement plays in island effects.

- (13) a. Did you hear that Mary asked Alex out?
b. Mary asked *who* out?

Finally, during the summer of 2019, I conducted preliminary fieldwork on the island sensitivity of ellipsis and of another type of construction, known as *Resumptive Pronouns* in Lebanese Arabic, in collaboration with Dr. Lina Choueiri. The relevance of resumptive pronouns is described at length in the accompanying research proposal. In the summer of 2020, we will begin the experimental design process, with data collection planned to begin in the fall of 2020.

Summary

Taken together, this research program represents the application of cutting edge on- and off-line experimental techniques to long-standing and deeply fundamental theoretical problems in the study of grammatical knowledge and its interaction with parsing mechanisms. This theory-driven empirically-oriented approach to the nature of this interaction, supported by a knowledgeable network of international collaborators, not only represents our best chance at making theoretical headway into the empirical phenomena, across all approaches to their explanation, but also serves as a bridge between traditional linguistics research and the broader cognitive science community.

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