Research statement

1 Summary

My research focuses on the interactions between competing operations in syntax and semantics, in light of the familiar phonological notions of Feeding and Bleeding. That is, how do certain operations create or obviate the environment for the application of other operations? A key interest that much of my work revolves around is the effects of overt and covert movement on structure building and interpretation. I have studied topics relating to this interest in *wh*-questions, focus constructions, quantification, and degree semantics. I am also interested in principles of economy of structure, in particular as they relate to inter- and cross-derivational constraints on possible structures and how they affect the online and offline computation of meaning.

Alongside traditional methods, my research employs a variety of experimental and quantitative tools. I believe that it is crucial for linguists to expand the methodologies available to them, and have therefore actively participated in the development of experimental tools for theoretical linguistics and in educating linguists in their use. By expanding the set of tools brought to bear on core linguistic questions, we enrich the range of questions that can be asked and successfully addressed. Establishing experimental paradigms and statistical analyses that are useful in the evaluation of existing theories and in the development of alternative ones is a central goal of my research.

2 Dissertation

My dissertation motivates a new syntax and semantics for *wh*-questions, bringing together ingredients familiar from the existing literature, combined in a novel way. The proposal builds on Cable's (2007; 2010) syntactic theory of pied-piping. I model the pair-list reading of the question as denoting a family of questions (Roberts, 1996; Hagstrom, 1998; Krifka, 2001; Büring, 2003; Fox, 2012; Nicolae, 2013, a.o.), and derive the pair-list and single-pair readings of the question from minimally different LFs. This theory naturally fits with existing analyses of the presuppositions of questions (Dayal, 1996, 2002; Fox, 2012) and with Beck's (2006) theory of focus intervention effects in multiple *wh*-questions.

The dissertation studies in detail the status of surface-in-situ *wh*-phrases. Recent theories adopt two strategies for the interpretation of *wh*-in-situ: long-distance covert movement to interrogative C (Karttunen 1977, a.o.) and in-situ computation (Hamblin 1973, a.o.). I present arguments from online sentence processing and offline judgments that in-situ *wh*-phrases in English superiority-obeying questions undergo covert movement, but in-situ *wh*-phrases in superiority-violating questions are truly in-situ at LF. I furthermore argue that the covert movement step of the in-situ *wh* should be modeled as *covert scrambling* instead of the unbounded movement that is traditionally assumed. Movement targets the first position where a *wh* is interpretable, and is only extended in extraordinary cases, e.g. to avoid an intervention effect or to facilitate ellipsis resolution. This makes the behavior

of English parallel to that of German, contributing to our understanding of the acquisition of questions and of the cross-linguistic typology of interrogative constructions.

The proposed syntax-semantics leads to a new descriptive generalization for focus intervention effects. I present novel data that the previously assumed strict correlation between intervention and superiority in English (Pesetsky, 2000) is incorrect. Instead, intervention occurs whenever the relation between a *wh*-word and its associated Q-particle is disrupted at LF. This happens in superiority-violating questions, inside overt and covert pied-piping constituents, and in superiority-obeying questions whenever covert *wh*-movement is restricted. Furthermore, intervention can be avoided in superiority-violating questions if the in-situ *wh* is given wide scope above an intervener through non-interrogative movement.

This work reflects my broader interest in how complex syntactic and semantic processes interact with the processor. The grammar of questions gets at the heart of a rich set of interlocking central themes in current linguistic research because of their cross-linguistically varied syntax, and the diverse set of semantic operations that are used in their computation. This work also highlights the possible contribution of new evidence from various quantitative methods to the evaluation of theoretical proposals. In future work I hope to continue to investigate the implications of the proposal I have made in my dissertation. In particular, I plan to extend my investigation to *wh*-in-situ languages, where the LF status of *wh*-phrases has been debated. Moreover, if my proposal is on the right track, the nature of covert *wh*-movement calls into question the status of formal *wh*-features as driving (covert) movement. I plan to further investigate the nature of the syntactic probing system, its timing, and its purpose in the architecture of grammar. I am furthermore revising my dissertation into a book-length manuscript for submission to a major scholarly press. Portions of this work have already been published in *Linguistic Inquiry*, and the proceedings of the Amsterdam Colloquium 2013 and NELS 44. The experimental component of the work is currently under review with *Natural Language & Linguistic Theory*.

3 Previous work

In previous work I have studied diverse aspects of competing operations in syntax and semantics beyond the grammar of questions, using both traditional and experimental tools. My research has combined behavioral data from perception and acquisition, physiological data, and traditional judgment data from various languages, to test existing theories and for developing new theories. Some of this work is summarized here.

3.1 Covert movement, degree semantics, and quantification

The syntax and semantics of *most* (Kotek et al. 2011a, *Syntax and Semantics* 37; Kotek et al. 2011b, *proceedings of SALT* 21; Kotek et al., to appear in *Natural Language Semantics*): Through a series of experimental studies involving grammaticality surveys, self-paced counting, and covered-box studies, Kotek et al. (2011a) show that *most* in subject position has a latent superlative reading in addition to the more prominent "more than half"

reading, contra Lidz et al. (2011). We propose a semantics for *most* that accounts for the distribution of these readings by allowing for different ways of partitioning the alternatives in the context. Kotek et al. (to appear) provides further experimental support for the superlative reading of *most* in subject position and offers a critical evaluation of Lidz et al.

Kotek et al. (2011b) shows that the superlative reading of *most* in subject position exhibits a "partition effect," and that this effect is ameliorated when another element has $\overline{\text{A}}$-moved across the superlative operator. We also show that even speakers who otherwise do not have a superlative reading of *most* in subject position are able to access that reading in the context of $\overline{\text{A}}$-movement. We propose an analysis of the "partition" reading that is based on a generalized superlative operator and its interaction with the notion of 'distinctness' that applies to the focus-alternatives that serve as input to the superlative operator.

Acquisition of Antecedent Contained Deletion (ACD) (Sugawara, Kotek et al. 2013, proceedings of BUCLD 37): We study children's acquisition of ACD. We show that children as young as 5 years old have already acquired the mechanism required for resolving local and non-local ACD (cf. Syrett and Lidz 2009, 2011). We also find a scope-matching preference (Hardt and Romero 2004, Breakstone et al. 2011) in the older but not the younger children: children displayed difficulty when more movement occurs in the derivation than is necessary for ellipsis resolution. This reflects a preference for the size of movement to match the size of an elided constituent in the same sentence. We suggest that the scope-matching preference was acquired by the older children and was missing in the younger ones, and propose that this may reflect a difference in how covert movement is performed by children and adults: children perform successive-cyclic movement, but adults sometimes construct a structure without such intermediary movement steps.

Degree relative clauses in Romanian (Kotek 2013, proceedings of NELS 40): I compare the behavior of Romanian degree relatives with the behavior of entity-headed relatives with regard to definiteness and maximality. I show that degree-headed relatives are unexpectedly interpreted as maximal even when they are morphologically indefinite, while entity-headed relatives are only interpreted as maximal when they are definite. I follow Rett (2006) in arguing that the relativizer *cât*, which introduces degree relative clauses, is an overt instantiation of a *Max* operator, and propose a semantics for the definite article and for *cât* that is able to distinguish between the contributions of definiteness and maximality. I show how this analysis derives the amount and substance readings of degree relatives in Romanian, and how it extends to cases of shifted reference.

3.2 Association with Focus, *wh*-questions, and pied-piping

Covert pied-piping in questions and Association with Focus constructions (Kotek and Erlewine, to appear in *Linguistic Inquiry*; Erlewine and Kotek 2014, proceedings of NELS 43): Many theories assume a mechanism of covert movement for both syntactic and interpretational purposes. We ask whether this movement triggers pied-piping, a phenomenon familiar from overt movement. We argue that intervention effects can diagnose the existence and size of covert pied-piping in *wh*-questions and Association with Focus constructions.

We show that covert pied-piping, unlike overt pied-piping, must be as large as possible, and argue that this reflects the preferences of the interfaces: LF prefers movement of large constituents to best satisfy economy principles, but PF prefers movement in which the *wh* is closer to the edge of the moved constituent (cf. Heck 2008), often resulting in movement of a smaller constituent. We furthermore argue for the interpretation of in-situ focus in Association with Focus constructions via covert focus movement (cf. Chomsky 1976, Drubig 1994, Krifka 2006, Wagner 2006) instead of via in-situ association (Rooth 1985, 1992).

Two kinds of *wh*-phrases in Hebrew (Kotek 2014, *Natural Language & Linguistic Theory*): I argue that Hebrew has two kinds of *wh*-phrases: those headed by a *wh*-word and those headed by another item, with different movement options available to them. I propose that *wh*-headed-phrases can be attracted by two distinct interrogative probes that occur on the same interrogative head at LF, while other *wh*-phrases can only be attracted by one of these probes. Certain configurations of *wh*-phrases bleed intervention effects: where we would normally expect to find a structure that is sensitive to intervention, it is exceptionally possible to build an LF that is immune to such effects. I show how this pattern of intervention effects is explained by the probing system I propose.

I furthermore show that superiority-violating questions are exceptionally blocked when the reading they would yield is identical to a reading that could be derived from a superiority-obeying question (cf. Wiltchko 1997 for German). That is, these questions cannot have a single-pair reading, and instead only a pair-list reading is available. I propose an account of this fact in terms of cross-derivational economy, building on work by Danny Fox. Further discussion of this phenomenon can be found in chapter 6 of my dissertation.

3.3 Experimental tools for theoretical linguists

Turktools (Erlewine and Kotek, to appear in *Natural Language & Linguistic Theory*): We develop a series of tools designed to assist linguists with little background in the use of empirical tools in the process of creating, posting, and analyzing online experiments using grammaticality surveys, picture-matching tasks, completion tasks, and covered-box tasks, with diverse designs using binary forced choice, Likert scales, slide-bars, and drop-down menus. The tools assist with the creation of HTML templates for the experiments, with randomization and the creation of lists, and with basic data analysis of the results. The resulting surveys can be posted on Amazon Mechanical Turk or hosted on the experimenter's own server. We discuss the usefulness of empirical tools to theoretical linguistic research in a broader context.

4 Future work

In future work, I plan to continue to pursue my interest in the interactions of competing operations in syntax-semantics and in quantitative investigations of grammatical theories. I hope to work in an environment that will allow for collaborations with colleagues and students, and to expand my work beyond the more familiar languages that I have concen-

trated on so far. I have already begun to work with native speakers of Chuj (Mayan) and Tibetan who are currently living in Montreal, and I plan to integrate data from these less studied languages into my research.

Although much of my work has studied movement phenomena, natural language allows for scope-taking without movement. In future work I plan to expand my investigation to phenomena of scope taking using alternative modes of composition, including focus alternatives computation in Association with Focus constructions and questions in *wh*-in-situ languages, and binding relations between high base-generated operators and their embedded associates, for example in relative clauses, in a variety of languages.

One question that I plan to explore is whether intervention effects in *wh*-movement languages are the same phenomenon as in *wh*-in-situ languages. To investigate this question, I plan to compare interveners and environments that give rise to intervention in the two types of languages. To my knowledge, no study has systematically examined intervention effects in multiple questions in *wh*-in-situ languages, and so one goal of my study will be to fill this empirical gap. I will then use my findings to compare the set of phenomena that have been described as "intervention effects" in *wh*-in-situ languages and *wh*-movement languages, with the goal of determining whether or not this is a unified phenomenon. This project will additionally compare these results with the behavior of Hungarian, whose focus projection interacts with a subset of the putative focus interveners in a way that may inform the correct characterization of intervention.

I plan to expand my experimental work on the processing of *wh*-questions to *wh*-in-situ languages. Xiang et al. (2013) show that questions incur an additional processing cost compared to declarative sentences in Mandarin Chinese, but they were unable to decide between a covert movement mechanism and one that does not involve movement for the interpretation of questions. I plan to compare the processing of questions with *wh*-adjuncts, which have been argued to involve covert movement (Huang 1982, Tsai 1999), to the processing of questions with *wh*-arguments, which have been argued to not involve movement for their interpretation (Tsai 1999, Shimoyama 2002). I furthermore intend to integrate production experiments into my research, to control for important effects of prosody on previous experimental findings.

On a broader scale, I plan to expand my research to other $\overline{\text{A}}$-movement constructions, starting with the syntax and semantics of relative clauses. Relative clauses show many of the phenomena that I have studied in the domain of *wh*-questions, including movement and pied-piping. However, to the best of my knowledge no intervention effects have been diagnosed in relative clauses, and pied-piping is of a different size than in questions. My goal is to describe the properties that are shared across different $\overline{\text{A}}$-construction, and to study whether they are also found in A-movement constructions. For example, I have already begun to document what appear to be intervention effects in some A-movement environments. The emerging set of similarities and differences will inform our understanding of the nature of movement in natural language, its extent, and its limitations.