Chapter 9

SITUATIONS AND SOLUTION CONCEPTS IN GAME-THEORETIC APPROACHES TO PRAGMATICS

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If Bidirectional Optimality Theory (BiOT) is restricted to operating over lexical items (or even simple clauses), it is unable to account for certain scalar implicatures that are determined by larger contextual factors. In order to accommodate such cases in this framework, the relevant units of optimization must be multi-clause sentences. If this step is taken, the predictions of BiOT and Games of Partial Information (GPis) converge in the case we examine, although they remain distinct in the general case. Such robust context-dependent examples of scalar implicature show that adequate models cannot reduce such phenomena to a localized, lexical account.

1 INTRODUCTION

When scalar implicature triggers interact with each other in the greater context of an utterance, the standard accounts of scalar implicature can fail (for such accounts, see Horn 1972; Gazdar 1979; Hirschberg 1985). A representative example of the kind of utterances that scalar implicature theorists aim to explain is shown in (1)-(2).

(1) Some people like kale.
(2) Not all people like kale.

(2) is said to be implicated by the utterance of (1). The reasoning goes as follows: all is more informative than some (when the domain is nonempty, all entails some), and since the utterer chose some, he was not in a position to assert that all people like kale. These scalar implicature triggers are on the Horn scale (all, some) (Horn, 1972). While such reasoning works for simple examples like (1), matters are more complicated for utterances with interacting scalar implicature triggers. In these cases, what is most informative on a local level may not be what is most informative on a global level. The issue of locality in implicature theory (in the form of the effect that negative or downward entailing contexts have on implicature) has recently been discussed by Chierchia (2004) and Sauerland (2004) (who come to rather different conclusions), but neither
author’s proposal addresses the cases of non-locality investigated here. In particular, we will examine cases in which sentences in the wider context affect the (non-)occurrence of implicature in sometimes startling ways. Cases which are quite removed from standard theories of implicature projection are along the lines of what Levinson (2000) has called “Gazdar’s bucket”.

BiOT (Dekker and van Rooy 2000, van Rooy 2004) and GPs (Parikh, 2001) are two game-theoretic frameworks that build upon earlier work in implicature (Grice 1975, Levinson 1983) with intuitive new formalisms. They both apply the notion of utility maximization to implicature computation (among other topics), a notion which has been recognized in one form or another as important for decades but has long resisted the relatively transparent and precise treatments offered by these authors. BiOT extends traditional Optimality Theory (Kager, 1999) by adding and optimizing along a second dimension. BiOT’s two dimensions are form and meaning (ranked by something like brevity or ease of utterance and informativeness respectively, rankings which will doubtless be improved upon as these phenomena are further examined), and winning candidates must be optimal with respect to each of them (unlike in OT syntax or semantics, in which only one dimension is optimized). The notion of form here corresponds to phonology as well as syntax and content, or meaning, corresponds to semantics. Note that the candidates in the “form” column of BiOT differ from those in the corresponding column of classical OT. In classical OT, the highest-ranked form wins the prize of well-formedness, and is not ranked according to anything like brevity. In BiOT, the candidates are all well-formed and the decision to be made is how they should be mapped to meanings; a decision that does not seem to turn on classical OT constraints like *VOICEDCODA. Dekker and van Rooy (2000) cast BiOT in terms of strategic games.

GPs are a different framework that did not grow out of Optimality Theory. In GPs, one starts with a set of possible intended meanings (with associated probabilities). For each such meaning the utterer must choose an utterance (possibly ambiguous) to verbalize it and for each utterance the addressee must choose an interpretation for it (payoffs are assigned based on a number of efficiency-related factors including successful communication, markedness of forms, informativeness of utterance, and processing/production costs). This is represented as an extensive, rather than strategic, game. The solution concept used is simply that of Nash equilibrium. In GPs, a similar form-meaning opposition manifests itself. For the speaker to use a less ambiguous utterance (to increase his payoff by constraining the choices of the addressee), he must usually utter a less brief expression (which will decrease his payoff since brevity is preferred). Solving for Nash equilibria is one way to find a balance between these opposing forces.

Both formalisms use Nash equilibria, but they are applied to different forms of strategies and games. Further work in the area may reveal the usefulness of different solution concepts (and forms of games). Perhaps BiOT may be fruitfully generalized to cover strategic games with imperfect information. Also, the probabilistic nature of communication might better be captured with the notions of correlated and mixed strategy Nash equilibrium in either of these formalisms. Other possibilities include eliminating actions that are not rationalizable or pursuing risk minimization strategies (assuming an opponent whose goal is to minimize their opponent’s payoff). Lastly, evolutionarily stable strategies might be able to model phenomena in language change and acquisition.¹

Dekker and van Rooy (2000, p. 240) state that, “It remains an open question how Parikh’s approach relates to the one discussed in this paper”. We will examine how they handle difficult cases of scalar implicature and shed light on this question in the process of doing so.

¹[See the papers in this volume by Cecilia & Paolo Di Chio, Pelle Guldborg Hansen as well as Gerhard Jäger on the evolutionary accounts of language change and acquisition.]