

Aside from possible extensions, however, it is debatable under what guiding principles should the present study be further extended.

Statistical parsing is a well-defined research area that has attracted a lot of attention in computational linguistics, and it has generated a set of techniques many of which have been used for or adapted to other tasks (Wu, 1997; Chelba and Jelinek, 1998; Goodman, 1999; Ramshaw et al., 2001; Collins and Roark, 2004; Huang and Chiang, 2005; Zettlemoyer and Collins, 2005; Chiang, 2007; Dyer, 2010). Statistical parsers (Collins, 1997; Klein and Manning, 2003; Briscoe et al., 2006; McDonald, 2006; Nivre et al., 2006; Curran et al., 2007), on the other hand, have mainly played the role of feature generators, producing annotations shown to be useful in various settings (Yamada and Knight, 2001; Chiang et al., 2008; Marton and Resnik, 2008; Mi et al., 2008; Chiang et al., 2009; Dyer and Resnik, 2010). In addition to being used in such capacities, however, it is apparent that their future role is likely to be limited in end-to-end language processing approaches, and in the endeavour to achieve automated human-level language understanding—beyond formalism-dependent parsing and natural language text processing—which remains elusive with currently available language technologies.

As a related issue, the practical implications for formalisms like CCG also calls for revisiting, with one notable reason being that alternatives such as dependency grammars have usually demonstrated their superior simplicity and cross-lingual scalability that are preferred in production systems (McDonald et al., 2013; Andor et al., 2016), which put more emphasis on empirical results rather than the linguistic properties of a grammar.

But more importantly on a higher level, it might be illuminating to ask: How useful is syntax for language understanding, is it relevant at all?

Overall, this thesis does not intend to serve as a proponent for parsing nor CCG. Instead, it purposes itself as an exploration of structured learning with inexact search—in the context of shift-reduce CCG parsing. It is hoped that future work will continue in this spirit.