

# Harmonic Grammar with Harmonic Serialism

Joe Pater

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Prince and Smolensky (1993/2004: 236) briefly consider, but reject, a version of Optimality Theory in which constraint ranking is replaced by numerical weighting, as in OT's predecessor Harmonic Grammar (HG: Legendre et al. 1990; Smolensky and Legendre 2006). Weighted constraints have a number of attractive properties. One is that they offer an account of cumulative constraint interaction that does not share the problems of Smolensky's (2006) extension of OT, Local Constraint Conjunction (Pater et al. 2007a). A second is that weighted constraints are compatible with learning algorithms that can learn gradually and correctly converge on a final state grammar (Jäger 2006; Boersma and Pater 2007; Jesney and Tessier 2007; Pater 2007). A third attractive property of weighted constraint grammars is that they can be straightforwardly adapted to yield variation, with the learning algorithms remaining robust (Goldwater and Johnson 2003; Boersma and Pater 2007).

In this talk, I begin by illustrating these properties of HG with a case of cumulative constraint interaction from the phonology of Japanese loanwords (Kawahara 2006). I then turn to problems with weighted constraints that may have discouraged earlier research. Constructing an analysis of a language can be much more difficult with weighted constraints than with ranked ones. It is even more difficult to determine what languages a given set of weighted constraints predicts to be possible. To address these problems, Pater, Potts and Bhatt (2007b) developed a method of solving OT/HG learning problems with the simplex algorithm, implemented as HaLP (Potts et al. 2007). OT-Help (Becker et al. 2007) uses this implementation to calculate typological predictions. Using OT-Help, we find that constraint sets that are used for stress typology in standard OT do in fact vastly overgenerate in HG (Pater et al. 2007b).

Prince and Smolensky (1993/2004: ch. 2) also consider an alternative model of interaction between Gen's operations and Eval's constraints, which they term Harmonic Serialism. McCarthy (2006 *et seq.*) demonstrates that Harmonic Serialism resolves a number of problems for standard OT. In the final part of the talk, I briefly show that Harmonic Serialism also yields benefits for HG, making it far from obvious that ranking is required to restrict the theory (see Pater et al. 2007a for related discussion).

## References

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