First Order versus Higher Order

powerful 'metalogic'

- Can 'talk about' sets using HOL
  - $(s_1, s_2) : V \times V$ is a pair of sets
    - $\langle s_1, s_2 \rangle : V$ is a set representing a pair
  - $f : num \rightarrow V$ is a sequence of sets
    - $f\ \mathsf{T}$ rejected by typechecking
  - $\bigcup f$ is an infinite union
    - $\bigcup : (num \rightarrow V) \rightarrow V$
- Sten Agerholm has interesting data from D_∞
- Like informal mathematics
  - constructions done in a higher order logic
  - use of set theory localised to where needed
- Maybe set theory in Martin Löf Type Theory or the Calculus of Constructions even better!