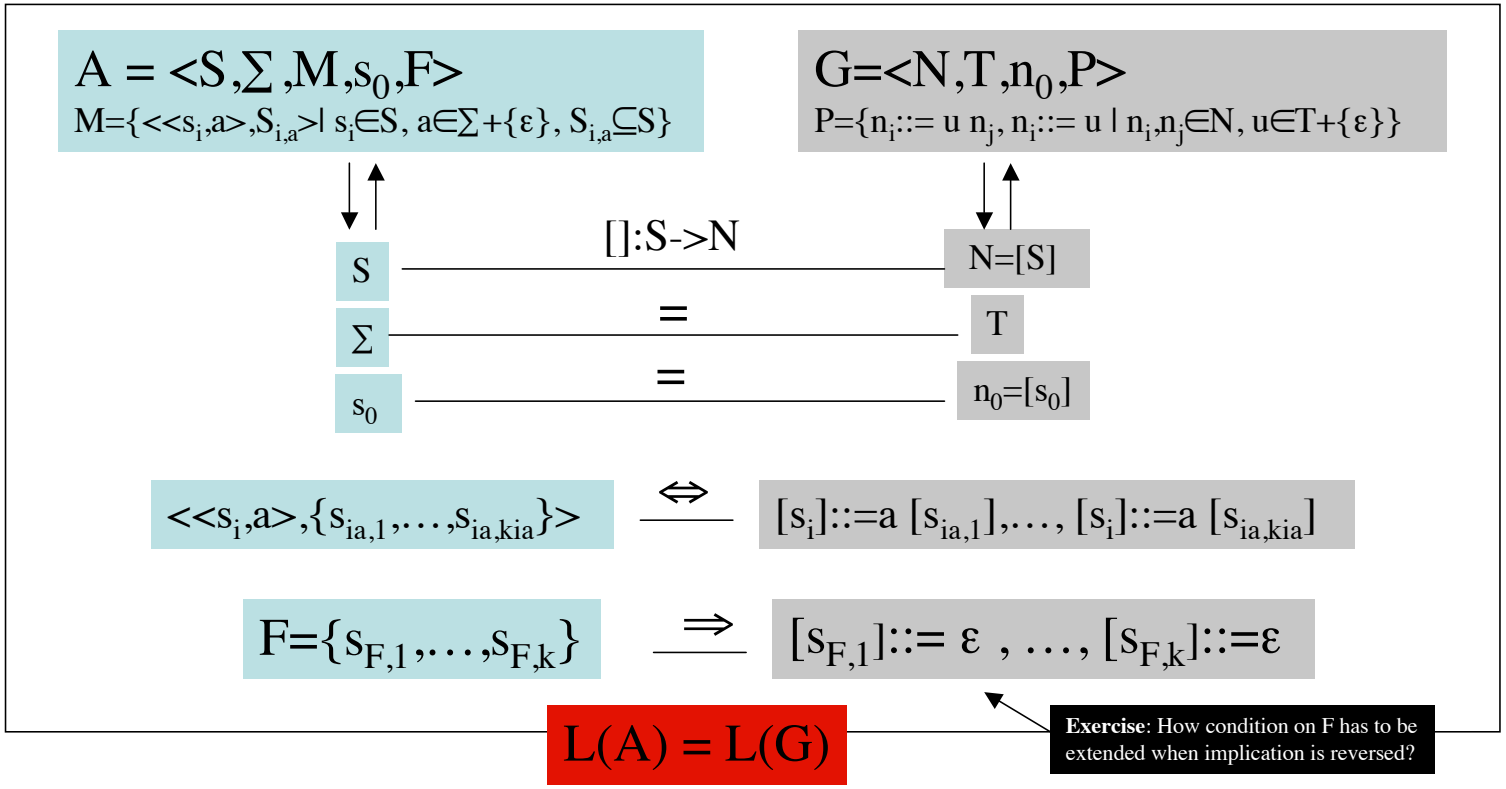
Regular Languages and Automata

- **Each Automaton defines a Regular Language:**
  - proved by the semantics given before and by the 3-step transformation **Automata *map into* Linear Grammars *map into* Regular Grammars**

- (conversely) **Each Regular Language has an Automaton that defines it?**
  - Automata (FSA) ?
    - proved by Thompson's construction
  - Deterministic Automata (DFA) ?
    - proved by the equivalence NFA ≈ DFA ≈ FSA

On The Equivalence FSA and L-Grammars (right)



Exercise: How condition on F has to be extended when implication is reversed?

Consider the grammar:

S::= a B
B::= a C | d
C::= b B

Compare it with:

Consider the grammar:

S::= a B
B::= a C | d D
C::= b B
D::= ε

Then: We can require a preliminary transformation from Linear to the sub-class of Strongly Linear (i.e. productions have the form: Either ni::=u nj, or ni::=ε)