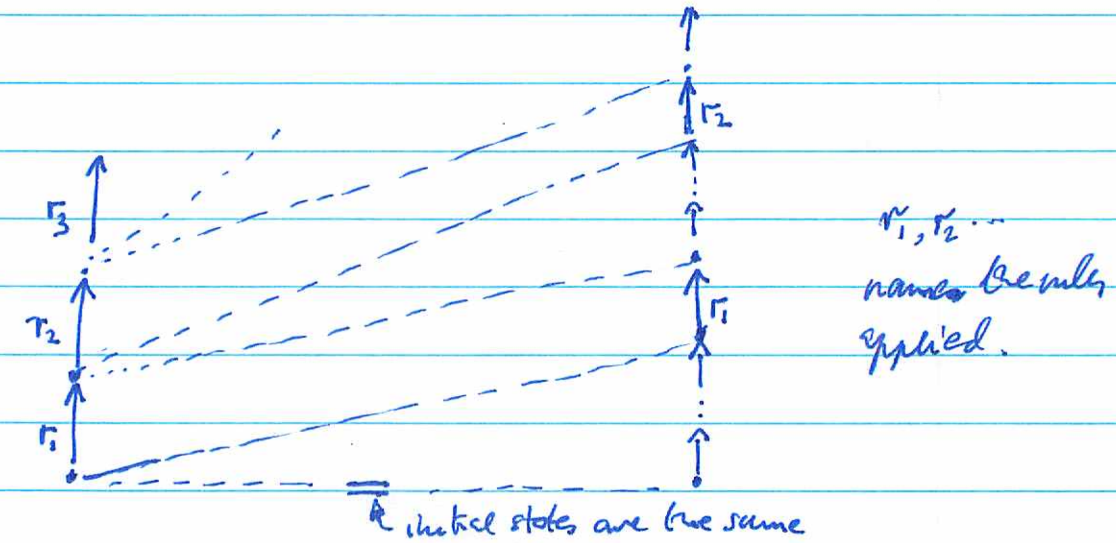
On Strong compression & simulations

Imagine a strong compression step

$$
\begin{tikzcd}
 & & & & \cdot \\
T_1 \arrow[r] \arrow[rrrr, dashed, bend left, "\sigma"] & \cdot \arrow[r] & \cdots \arrow[r] & \cdot \arrow[r] & T_2 \arrow[u, "\alpha_2"'] \\
\cdot \arrow[u] & & S \arrow[ull, "\varphi_1"] \arrow[urr, "\varphi_2"'] & &
\end{tikzcd}
$$

associated with a rule $\alpha : S \to S'$. A strong compression step is possible even in the extreme situation where in the intermediate actions $T_1 \to \to \cdots \to \to T_2$ all agents ~~co~~ have been ~~[illegible]~~ deleted and then re-created. Given this we can't expect any form of (weak) commutation relation to hold between φ_1, φ_2 and the intermediate actions. We might say, as I did in Barbados, that ~~that~~ what was required was a partial bijection σ between agents of T_1 and agents of T_2 that ~~com~~ makes $\sigma \circ \varphi_1 \sim_{Ag} \varphi_2$, and then proceed as for weak compression. BUT the fact that the same rule can be applied at T_1 and T_2, that both embeddings φ_1 and φ_2 are present, directly ensures such a partial bijection via S. So that approach contains lots of redundancy.

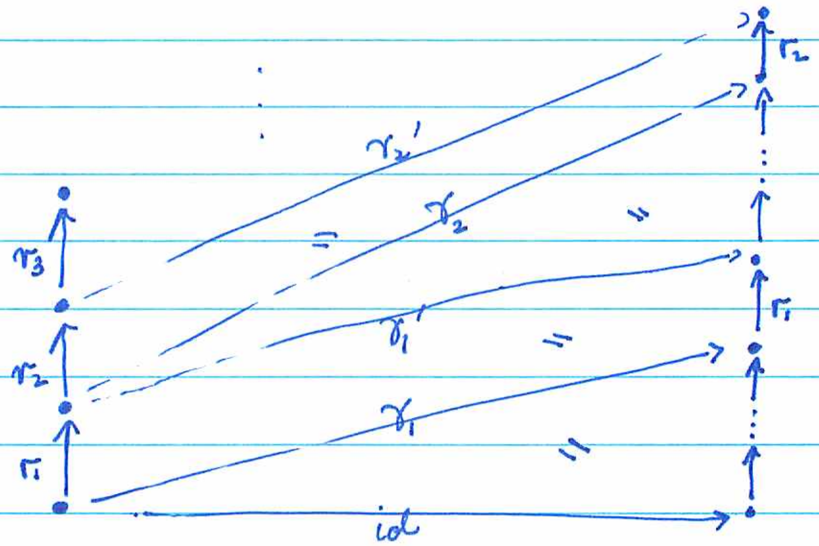
I think this leads to a view of strong compression as a form of simulation:



given simply by a (~~xxxx~~ set-theoretic) ~~relation between states of the compressed trace~~ ~~and~~ function from the states of the ~~original~~ compressed trace to states of ~~function from the~~ the ~~compressed~~ original trace. [Do you agree?]

The earlier simple and weak compressions are associated with more refined forms of simulation.

The simulation of simple compression:



For simple compression ~~is given~~ the function between states is accompanied by action maps γ_i, γ_i' satisfying ~~the~~ commutativity conditions.

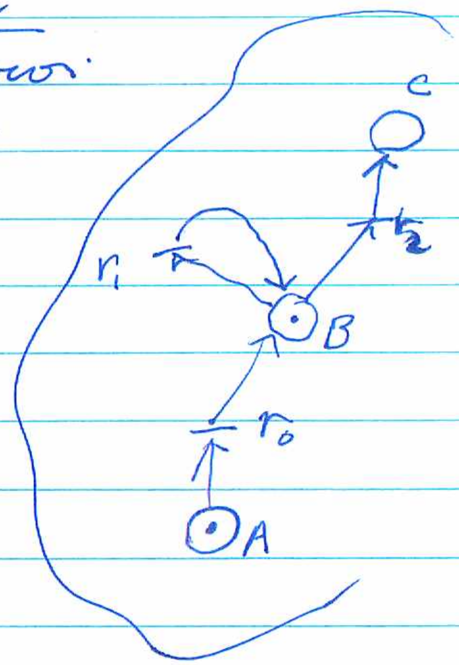
For weak compression the function is accompanied by ~~[illegible]~~ partial injections on agents such the commutativity conditions only ~~to~~ need hold up to identity of agents.

Make sense?

~~r_1 : (A) $\to$ (B)~~

~~r_2 : (B) $\to$ (C)~~

Example of a strong compression.



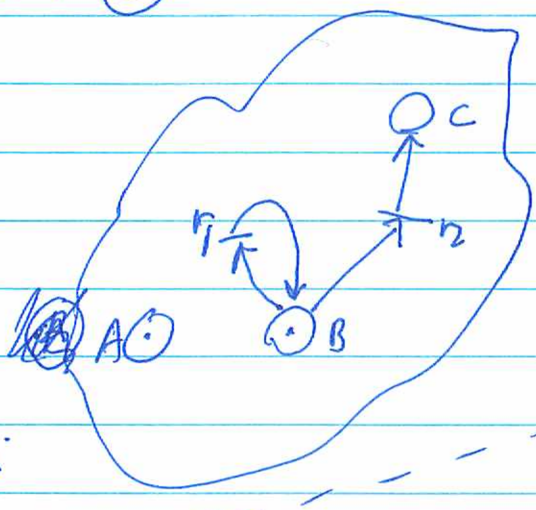
Rules:

r_0 : (A) $\to$ (B)

r_1 : (B) $\to$ (B)

r_2 : (B) $\to$ (C)

Initial soln. (A) (B)



original version

compressed version