

- Consider transmitting an information source with entropy rate  $H$  reliably through a DMC with capacity  $C$ .
- If  $H < C$ , this can be achieved by separating source and channel coding without using feedback.
- Specifically, choose  $R_s$  and  $R_c$  such that

$$H < R_s < R_c < C.$$

- It can be shown that even with complete feedback, reliable communication is impossible if  $H > C$ . See textbook for details.