Main idea

- Define action a to be $Q^{(2)}[r^{(1)}]$ as a function of the response $r^{(1)}$

- Define loss function

- Using Bayes risk lower bounds, argue that loss is close to 1 in expectation

- Second round query doesn't have a large information about (u, v) as well

- Induct using Bayes risk

$$L((u,v),Q^{(2)}[r^{(1)}]) = 1[\|Q^{(2)}[r^{(1)}] \cdot (u \otimes v)\|_2^2 < \text{some value}]$$

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Next Steps