On the Value of Persuasion by Experts by R. Alonso and O. Câmara

Maxim Ivanov

McMaster

October 2017

Main question

- Consider communication between an expert (sender) and a decision maker (receiver)
- An expert selects an experiment that provides information relevant for both players
- The receiver then takes an action, which affects players' payoffs
- Before selecting an experiment, the expert can gather some preliminary private information

Main question

Is it better for the expert to be more informed before selecting an experiment?

Key trade-off

- On one side, the expert can **benefit** from extra information:
  - extra information can complement the one revealed by an experiment
  - it can guide the expert toward a particular experiment
  - thus, the experiment can reveal two pieces of information: one via an outcome and the other via expert's choice
- On the other side, the expert can be **hurt** by extra information:
  - extra information means more possibilities to lie via selecting experiment.
  - thus, the expert's choice of an experiment does not tell much about her information: it is lost
  - the fact that the expert is informed can change the receiver's actions: this change can hurt the expert more than informational gains

Main question

- It is better to obtain some information first if it complements the future one and players' preferences are close enough
- But what if preliminary information is redundant to the future one?
  - that is, it cannot improve the one which is produced by some or even any experiment
- The role of expert's **redundant** information is the main focus of the paper

Main question

- It is better to obtain some information first if it complements the future one and players' preferences are close enough
- But what if preliminary information is redundant to the future one?
  - that is, it cannot improve the one which is produced by some or even any experiment
- The role of expert's **redundant** information is the main focus of the paper

Main question

- It is better to obtain some information first if it complements the future one and players' preferences are close enough
- But what if preliminary information is redundant to the future one?

  - that is, it cannot improve the one which is produced by some or even any experiment
- The role of expert's **redundant** information is the main focus of the paper

Model

- A modified model of Bayesian persuasion by Kamenica and Gentzkow (2011)
- Two key differences:
  1. The expert is partially informed about the state at the beginning
  2. The expert is limited in her choice over experiments.
- The expert can introduce noise into experiments or mix among them.

Result 1: when it is better for the sender to be uninformed

- First, the paper provides sharp characterization of scenarios in which the expert cannot benefit from being more informed
- Namely, given any players' interests it is better to remain uninformed if and only if expert's information is **sequentially redundant** to available experiments
- What is sequential redundancy?

Result 1: when it is better for the sender to be uninformed

- First, the paper provides sharp characterization of scenarios in which the expert cannot benefit from being more informed
- Namely, given any players' interests it is better to remain uninformed if and only if expert's information is **sequentially redundant** to available experiments
- What is sequential redundancy?

Result 1: when it is better for the sender to be uninformed

- First, the paper provides sharp characterization of scenarios in which the expert cannot benefit from being more informed
- Namely, given any players' interests it is better to remain uninformed if and only if expert's information is **sequentially redundant** to available experiments
- What is sequential redundancy?

Sequential redundancy - definition and implications

- Main idea: the receiver does not care about expert's input (her information and how it affects the choice of an experiment). He only cares about her output (an outcome of the experiment).
- Formally, it means that the information jointly contained in any expert's type and an outcome of *any* subsequent choice of an experiment is not better than the information produced by some available experiment
- There should exist an experiment (or a mixture) that perfectly substitutes observing expert's type and subsequent choice of this type
- Implication: the informed expert cannot benefit from her information since it:
  (1) does not complement the one revealed by the experiment
  (2) cannot be used to navigate the expert toward a specific experiment.
- The distance between states and actions can be covered in one step rather than two.

Sequential redundancy - definition and implications

- Main idea: the receiver does not care about expert's input (her information and how it affects the choice of an experiment). He only cares about her output (an outcome of the experiment).
- Formally, it means that the information jointly contained in any expert's type and an outcome of *any* subsequent choice of an experiment is not better than the information produced by some available experiment
- There should exist an experiment (or a mixture) that perfectly substitutes observing expert's type and subsequent choice of this type
- Implication: the informed expert cannot benefit from her information since it:
  (1) does not complement the one revealed by the experiment
  (2) cannot be used to navigate the expert toward a specific experiment.
- The distance between states and actions can be covered in one step rather than two.

Sequential redundancy - definition and implications

- Main idea: the receiver does not care about expert's input (her information and how it affects the choice of an experiment). He only cares about her output (an outcome of the experiment).
- Formally, it means that the information jointly contained in any expert's type and an outcome of *any* subsequent choice of an experiment is not better than the information produced by some available experiment
- There should exist an experiment (or a mixture) that perfectly substitutes observing expert's type and subsequent choice of this type
- Implication: the informed expert cannot benefit from her information since it:
  (1) does not complement the one revealed by the experiment
  (2) cannot be used to navigate the expert toward a specific experiment.
- The distance between states and actions can be covered in one step rather than two.

Sequential redundancy - definition and implications

- Main idea: the receiver does not care about expert's input (her information and how it affects the choice of an experiment). He only cares about her output (an outcome of the experiment).
- Formally, it means that the information jointly contained in any expert's type and an outcome of *any* subsequent choice of an experiment is not better than the information produced by some available experiment
- There should exist an experiment (or a mixture) that perfectly substitutes observing expert's type and subsequent choice of this type
- Implication: the informed expert cannot benefit from her information since it:
  (1) does not complement the one revealed by the experiment
  (2) cannot be used to navigate the expert toward a specific experiment.
- The distance between states and actions can be covered in one step rather than two.

Sequential redundancy - definition and implications

- Main idea: the receiver does not care about expert's input (her information and how it affects the choice of an experiment). He only cares about her output (an outcome of the experiment).
- Formally, it means that the information jointly contained in any expert's type and an outcome of *any* subsequent choice of an experiment is not better than the information produced by some available experiment
- There should exist an experiment (or a mixture) that perfectly substitutes observing expert's type and subsequent choice of this type
- Implication: the informed expert cannot benefit from her information since it:
  (1) does not complement the one revealed by the experiment
  (2) cannot be used to navigate the expert toward a specific experiment.
- The distance between states and actions can be covered in one step rather than two.

Can the sender benefit from redundant information?

- Sequential redundancy means that there exist experiments which are *uniformly* precise enough compared to any expert's information and any selection strategy.
- But can the sender benefit from redundant, but not sequentially redundant information?
- The paper addresses this question for the case of **strong redundancy**.
- Strong redundancy means that expert's information is redundant to each experiment separately.
- That is, observing the sender's signal does not affect the receiver's beliefs induced by an experiment.

Result 2: role and implications of strong redundancy

- Strong redundancy serves two purposes:
  1. It allows the expert to potentially gain from using her information in order to select a particular experiment
  2. It eliminates the incentives to distort her private information via selecting an unexpected experiment
- Thus, there is equilibrium in which each sender's type selects an experiment that would be selected by this type in game with expert's public information
- Implications:
  1. Sender's highest payoff in a game with a private information cannot be lower than that in a game with public information
  2. Game with expert's public information is easy to solve by repetition of Kamenica and Gentzkow's approach for all expert's types

Result 3: when it is worse for the sender to be uninformed

- The paper provides partial characterization of scenarios in which the expert is hurt by her private information
- Intuitively, it happens if some expert's types (say, good types) prefer to provide experiments which certify these types
- However, not observing such experiments serves as a certification that the expert's type is bad. This may result in receiver's actions whose negative effect destroys all benefits from certifying good types

Result 3: when it is worse for the sender to be uninformed

- The paper provides partial characterization of scenarios in which the expert is hurt by her private information
- Intuitively, it happens if some expert's types (say, good types) prefer to provide experiments which certify these types
- However, not observing such experiments serves as a certification that the expert's type is bad. This may result in receiver's actions whose negative effect destroys all benefits from certifying good types

Result 3: when it is worse for the sender to be uninformed

- The paper provides partial characterization of scenarios in which the expert is hurt by her private information
- Intuitively, it happens if some expert's types (say, good types) prefer to provide experiments which certify these types
- However, not observing such experiments serves as a certification that the expert's type is bad. This may result in receiver's actions whose negative effect destroys all benefits from certifying good types

Conclusion

- The main ideas and results in the paper are general and detail-free:
  - no specific assumptions about prior information, player's interests, or a set of available experiments
- It would be useful to apply these ideas to some known economic applications:
  - model by Crawford and Sobel (1982) is a potential candidate
- Moral hazard: the expert can privately select a test that provides private information to her at the beginning of the game.
- The role of experiments with a random noise: the sender has a limited set of experiments, but can repeat the same experiment. Then, repeating an experiment compensates its imperfect precision.

Conclusion

- The main ideas and results in the paper are general and detail-free:
  - no specific assumptions about prior information, player's interests, or a set of available experiments
- It would be useful to apply these ideas to some known economic applications:
  - model by Crawford and Sobel (1982) is a potential candidate
- Moral hazard: the expert can privately select a test that provides private information to her at the beginning of the game.
- The role of experiments with a random noise: the sender has a limited set of experiments, but can repeat the same experiment. Then, repeating an experiment compensates its imperfect precision.

Conclusion

- The main ideas and results in the paper are general and detail-free:
  - no specific assumptions about prior information, player's interests, or a set of available experiments
- It would be useful to apply these ideas to some known economic applications:
  - model by Crawford and Sobel (1982) is a potential candidate
- Moral hazard: the expert can privately select a test that provides private information to her at the beginning of the game.
- The role of experiments with a random noise: the sender has a limited set of experiments, but can repeat the same experiment. Then, repeating an experiment compensates its imperfect precision.

Conclusion

- The main ideas and results in the paper are general and detail-free:
  - no specific assumptions about prior information, player's interests, or a set of available experiments
- It would be useful to apply these ideas to some known economic applications:
  - model by Crawford and Sobel (1982) is a potential candidate
- Moral hazard: the expert can privately select a test that provides private information to her at the beginning of the game.
- The role of experiments with a random noise: the sender has a limited set of experiments, but can repeat the same experiment. Then, repeating an experiment compensates its imperfect precision.