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Essays on Communication and Information Transmission

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Summary

This PhD dissertation addresses different issues concerning communication and information transmission in a game theoretical framework. I analyze different dilemmas that a player who sends information has to deal with. These dilemmas correspond to the following questions: "Should I invest into a verifiable message?", "When should I pass my information?" and "Is it better if I do not send my information, but collect information from others?".
This thesis includes an introduction and three chapters. The introduction contains a general motivation for the three different problems that I model in this thesis. I give a detailed overview of all the chapters, survey the related literature and compare it to my results.

The first chapter, "Communication Games with Optional Verification" studies a Sender-Receiver game where the Sender can not only choose between cheap-talk messages, but can also select a costly verifiable message. I provide conditions under which the Receiver can enforce the Sender to tell the truth in all states of the world. Furthermore, I deal with the situation when full revelation is impossible and apply my results to the often used quadratic loss function.

The second chapter, "Information Transmission in Hierarchies" deals with a different problem of communication. Players in a hierarchy have to transmit information to their superiors. They face a communication dilemma, because they have two contrary incentives: On the one hand, they like to pass their information as early as possible, on the other hand, they can get an additional reward if they are the last player to submit. In this framework, I give a detailed analysis of a model where all players are directly connected to a principal. Furthermore, I study hierarchies with several layers. I compare different hierarchical structures and show that the speed of the centralization process does not only depend on the parameters of the model, but also on structure of the hierarchy.

The third chapter, "Centralizing Information in Endogenous Networks" analyzes the transmission of information in team projects when all players compete for the leadership of that project. In this setting a different communication dilemma arises: The players want that one of them centralizes all information as fast as possible and at the same time they have strong incentives to be the one that centralizes the information. I prove that in a connected network there is always a single player who becomes the winner. Not only the network structure, but also the discount factor and the decision order determine who centralizes all information. Furthermore, I show that only minimally connected networks can be pairwise stable. I state further conditions to find the set of pairwise stable networks for all values of the parameters.