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List of Abbreviations

e.g.	exempli gratia (for example)
etc.	et cetera
ERC	Equity, reciprocity, and competition
FGH	Fair-greedy, high bonus
FGHD	Fair-greedy, high bonus, Dictator version
FGHU	Fair-greedy, high bonus, Ultimatum version
FGS	Fair-greedy, small bonus
FGSD	Fair-greedy, small bonus, Dictator version
FGSU	Fair-greedy, small bonus, Ultimatum version
FTP	Freedom to Punish
GNP	Gross National Product
i.e.	id est
MWU	Mann-Whitney-U
RAP	Right and Choice to Punish
VGH	Greedy-very greedy, high bonus
VGHD	Greedy-very greedy, high bonus, Dictator version
VGHU	Greedy-very greedy, high bonus, Ultimatum version
VGS	Greedy-very greedy, small bonus
VGSD	Greedy-very greedy, small bonus, Dictator version
VGSU	Greedy-very greedy, small bonus, Ultimatum version
vs.	versus
w/o	without

List of Variables and Design Parameters

C	Cake
χ^2	Chi-Square for the Chi-Square-Test
δ	Bonus in the FTP Game, low bonus in the RAP Game
δ^*	RAP Game
ε	Smallest possible unit, i.e. DM 0,01
FTP	Freedom to Punish
H^0_{FTPX}	Null hypothesis No. X for the FTP game
H^A_{FTPX}	Alternative hypothesis No. X for the FTP game
H^0_{RAPX}	Null hypothesis No. X for the RAP game
H^A_{RAPX}	Alternative hypothesis No. X for the RAP game
L	Leave
N, NV	No veto power
p	In general: probability, here: significance level
P	Proposer
PY...	Strategies of the Proposer, explained in chapter I.I.6.
R	Receiver
RAP	Right and Choice to Punish
RN..., RV...	Strategies of the Receiver, explained in chapter I.I.6.
S*	Complete equilibrium strategy for both players P and R
S_P^*	Complete equilibrium strategy for player P
S_R^*	Complete equilibrium strategy for player R
σ	Standard deviation of single values
T	Take
V, VP	Veto power
X	Number of a hypothesis
y	Demand in the FTP Game

y, y*	Low Demand in the RAP Game
Y, Y*	High Demand in the RAP Game
Δy	Difference between high and low demand
Z	Z-value for Mann-Whitney-U statistical test

A. Introduction

The field of experimental economics has grown steadily for about half a century, providing models and studies that inspired even more research. For the history of experimental economics, see Kagel and Roth (1995); for the fundamental methods, see Davis and Holt (1993). In this study, two new bargaining situations are modeled and the collected experimental data is analyzed and interpreted. Along with the experimental findings, new theoretical concepts are considered and applied. Among these are the general concept of fairness, the crowding-out of intrinsic motivation and freedom of choice, all of which are not yet included in standard economic theory and therefore might prove to be worthwhile possible enhancements. This study supports the relevance of all of these concepts, and suggests some implementations and consequences.

I. Motivation and Research Objectives

Many economic models have been developed, then radically criticized, and finally refined, most of them for uncountable many times. The area of experimental economics offers another possibility. Instead of constructing models using just pure theory, experimenters are able to build models guided by existing laboratory data (Bolton 1998). These models can be easily and exhaustively tested by using new or more sophisticated laboratory methods, providing an instant and qualitatively controlled feedback.

Much of the innovative theoretical work has been inspired by the huge collection of experimental data or game theoretic approaches that were built up over the last decades. Some examples are the idea of "relative money" as an indicator for fairness (Bolton 1991), the game-theoretic modeling of fairness (Rabin 1993) or new functional forms of preferences (Bolton and Ockenfels 1999, Fehr and Schmidt 1999). The norm of fairness plays an important role in this context. The underlying intrinsic motivation, be it for fairness or other socially desirable norms, has to be defined, isolated and (if possible) measured (see Frey 1997c).

For example, the game theoretic prediction for Ultimatum bargaining experiments proved to be inaccurate to explain behavior in the laboratory. Two

major observations could be extracted. Responders turned down meager but positive offers, therewith giving up money. And proposers made fair offers instead of using their strategic advantage, also giving up money. An equivalent observation holds even for the Dictator game, when Dictators offered sustainable amounts of money to the Recipients. Since this behavior does not maximize the payoff of the respective individual, it is not in line with the game theoretic prediction. Therefore, the underlying model of human motivation, which is based on monetary incentives according to standard economic theory, had to be enhanced. The baseline of all enhancements was fairness. The ERC theory of Bolton and Ockenfels (1999) takes fairness into account by including the relative payoff standing into the individual's motivation function. This new approach is successful in organizing a lot of laboratory data, including Ultimatum and Dictator experiments, but fails to predict the punishments observed by Ahlert, Crüger, and Güth (2001) in their so-called Equal Punishment game. Therefore, further refinements have to be done, and the relevance of intrinsic motivation in relation to fairness has to be analyzed. The game to be developed in this study called "Right and Choice to Punish" serves this purpose. The experimental results confirm the relevance of fairness as well as intrinsic motivation, and that they can play an important role for economic outcomes. But they also prove that no straightforward concept for the observed behavior exists and that fairness can be steady as well as fragile, meaning that it can prevail for a short or a very long time. It is also shown that a crowding-out of this intrinsic motivation is possible and sometimes even very likely to happen. Furthermore, an influence of the institutional frame on behavior was observed, especially by means of a comparison between the "Right and Choice to Punish" game and the "Freedom to Punish" game.

A second and related game called "Freedom to Punish" is also newly developed and aimed at another theoretical concept, freedom of choice. Both games add a new dimension to the existing Ultimatum and Dictator Literature. A first decision step is included, a possibility for the responder to choose between a situation with veto power, just like in an Ultimatum game, and a situation without veto power, just like in a Dictator game. This might make the game more complex, but provides unique opportunities to observe characteristics of both concepts, intrinsic motivation as well as freedom of choice.

In contrast to standard choice theory, freedom of choice – very roughly – assigns positive values to all kinds of alternatives, be it wanted or unwanted choices. The pure existence of another alternative raises the freedom of choice of the respective individual and is therefore a welcome and enriching (new) possibility. During the past ten years an increasing number of authors have modeled the individual welfare that arises from having the freedom to choose

from a given set of alternatives. Several sets of axioms have been proposed to characterize rankings of opportunity sets in terms of freedom of choice. The experimental investigation to be studied in this work may contribute to the existing research in that area. Therefore, several experiments were conducted with "Freedom to Punish", a game that is a combination of a Dictator game (a no-choice-situation for the receiver) and an Ultimatum bargaining game (the receiver can choose between the two options accept and reject). The objective of the analysis is to investigate whether receivers prefer to have some freedom of choice or to have no choice dependent on the size of the monetary payoffs. The experimental results strongly support the idea of freedom of choice: players were not willing to drop an alternative without incentives to do so, but even with a small bonus they gave up their freedom of choice and excluded this alternative. As might be expected, higher monetary incentives generated more exclusions. The structure of this study is illustrated in the following paragraph.

II. Overview and Contents

The theory of bargaining has always been one of the main areas of interest for experimental economists, and therefore the existing results are both numerous and very diversified. Chapter B. summarizes the theoretical and experimental work in the field of bargaining. Even though some very helpful surveys by Güth and Tietz (1990), Roth (1995) or Güth (1995) already exist, an updated compilation is necessary since a great number of studies, which are especially relevant for this work, have been produced during the last couple of years. Furthermore, past results are grouped and analyzed to clarify how this study fits into existing research and theory. Grounding on that, it is shown how those research results may interact with the phenomenon of fairness. Therefore, chapter B. can also be seen as a short survey in the area of two person bargaining experiments.

Chapter C. deals with some aspects of fairness and intrinsic motivation, as well as with some of the theoretical work based on the existing amount of experimental data or game theoretic approaches. The connection to the underlying intrinsic motivation in some of the models is discussed. The concept of a crowding-out of intrinsic motivation is explained and discussed. The other major concept relevant to the present study is called freedom of choice, which is described in more detail in chapter D. The baseline for an axiomatic approach is outlined and the applicability of an experimental approach is shown.