

Naïve advice when half a million is at stake[☆]

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Received 26 April 2006; received in revised form 2 April 2007; accepted 5 April 2007

Available online 24 August 2007

Abstract

In the television show *Affari Tuoi* contestants face decision problems with large monetary payoffs and have an opportunity to seek advice from the audience. It appears that this advice does not have a significant impact on the decisions of contestants.

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Keywords: Advice; Decision making; Television show; Natural experiment

JEL classification: C93; D81

1. Introduction

Taking and giving advice plays an important role in the life of many people. We seek advice from family, friends or colleagues in different situations. While we particularly value advice given by experts or people, who have experience with making similar choices, we are often guided by “naïve” advisors, who hardly possess more expertise or knowledge than we do (Schotter, 2003).

Several studies analyze the impact of advice on individual decision making. Evidence in this field comes primarily from laboratory experiments. Particularly, Schotter (2003) surveys several laboratory studies on advice when nonoverlapping “generations” of subjects play ultimatum and coordination games. In these studies (e.g. Schotter and Sopher, 2004, 2007) subjects often rely on the advice of naïve

[☆] I am grateful to Glenn Harrison, Anita Gantner and an anonymous referee for their insightful comments and suggestions.

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advisors. Schotter (2003) argues that advice influences subjects' behavior making their decisions more rational and closer to the predictions of economic theory. In a social-learning experiment Çelen et al. (2004) find that when given a choice between the history of play from the previous "generations" and advice, subjects opt for the latter. However, Nyarko et al. (2006) show that when advice is sold in experimental markets, subjects bid more for the history than they bid for advice. There is also evidence that advice catalyzes the formation of behavioral conventions in ultimatum games (Schotter and Sopher, 2007) and increases trustworthiness in trust games (Schotter and Sopher, 2006).

Although the impact of individual advice has received a lot of attention in experimental literature, economic research provides little guidance as to how and to what extent group advice influences individual decisions. Yet, in many real life situations advice is provided by a group of people rather than by individual advisors. To date, there has been only one attempt to study group advice giving. Chaudhuri et al. (2001) use an inter-generational minimum effort game and find that group advice facilitates coordination only when it is public and common knowledge.

This paper studies group advice in a natural experiment, provided by the Italian television game show *Affari Tuoi* with large monetary stakes. When faced with a decision problem in *Affari Tuoi*, a contestant may seek advice from the audience, which comes in a form of the vote results. While there is a positive trend between contestants' decisions and advice, this relation is not statistically significant. Apparently, contestants tend to ignore group advice, even though the *ex post* analysis of decisions suggests that following advice increases their earnings.

Economists often turn to the natural laboratories of television shows as a useful tool for analyzing human behavior, because these shows are often structured as well-defined decision problems or strategic games (Metrick, 1995). The majority of papers on natural experiments from television shows elicit individual risk attitudes over large stakes (e.g. Gertner, 1993; Metrick, 1995; Beetsma and Schotman, 2001; Post et al., 2004; Bombardini and Trebbi, 2005). Apart from risk attitudes, different aspects of economic phenomena are analyzed using television shows. Particularly, Bennett and Hickman (1993), Berk et al. (1996) and Tenorio and Cason (2002) employ the natural laboratory of *The Price is Right* to test for the optimal information updating, rational bidding strategies and Nash equilibrium play respectively. Levitt (2004) and Antonovics et al. (2005) examine discrimination in *The Weakest Link*. Blavatsky and Pogrebna (2006, in press) analyze loss and risk aversion in *Affari Tuoi*.

The remainder of the paper is organized as follows. Section 2 briefly describes the television show and provides basic statistics. The impact of advice on the decisions of contestants is analyzed in Section 3. Section 4 concludes with a general discussion.

2. Description of the television show and basic statistics

Affari Tuoi is the Italian prototype of the television show *Deal or No Deal* produced by the media company Endemol. Before each television episode an independent notary company randomly assigns monetary prizes to twenty consecutively numbered boxes (the distribution of prizes is depicted on Fig. 1). These boxes are sealed and randomly assigned to twenty contestants, representing different regions of Italy. After a brief selection procedure (a general knowledge quiz) one contestant receives an opportunity to randomly open boxes while keeping one sealed box in her possession. Once a box is opened its content is eliminated from the list of possible prizes. At any point in the show the contestant is aware of the distribution of possible prizes inside her box, however, she does not know the content of her box.



Fig. 1. The distribution of possible prizes in the beginning of the game.

As the game progresses and the number of unopened boxes declines, the contestant receives offers from the “bank” to sell or exchange her box. This paper concentrates on monetary offers that are typically a fraction of the expected value of possible prizes. The game terminates when either the contestant accepts a monetary offer or when all twenty boxes are opened, in which case the contestant leaves with the content of her box. After the contestant receives a monetary offer and before she makes a decision, she may seek advice from the audience about whether to accept or reject the amount offered by the “bank”. This advice comes in the form of the vote results, i.e. contestant is informed about the percentage of people in the audience, who voted for accepting and rejecting the monetary offer.

The natural laboratory used in this paper consisted of 114 television episodes aired on the first channel of the Italian television RAI Uno from September 20, 2005 to March 4, 2006. The main advantages of this natural experiment are large monetary incentives and more representative subject pool than in conventional laboratory experiments. The total budget of this natural laboratory amounted to €3,364,852. Actual average earnings of contestants were €29,516 (minimum and maximum earnings were €0.01 and €250,000 respectively). Contestants, aged from 23 to 70, from all regions of Italy participated in the show. 54% of contestants were female and 46% male. The overwhelming majority of contestants were married (79%), 14% — single, 5% — divorced and 2% — widowed.¹

3. Analysis

In our sample of 114 television episodes, the show regulations allowed contestants to seek advice in 61 episodes. The total natural laboratory consisted of 402 decisions of *Affari Tuoi* contestants. Contestants

¹ Detailed basic statistics on demographics, age, gender and earning of contestants is given in Blavatskyy and Pogrebna (in press).

Table 1
Ex post assessment of decisions with advice ($N=36$)

Advice from audience	Decision of contestant	Number (percentage) of cases when...	
		Prize in contestant's box is greater than the monetary offer	Prize in contestant's box is less than the monetary offer
Accept	Accept	3 (8.3%)	4 (11.1%)
Reject	Reject	12 (33.3%)	4 (11.1%)
Accept	Reject	3 (8.3%)	2 (5.6%)
Reject	Accept	4 (11.1%)	4 (11.1%)

made 172 decisions when they did not have an option to use advice and 230 decisions when advice was available. In 38 out of 230 cases contestants exercised their right to consult the audience when the monetary offer was made. In 2 cases out of 38 the vote between two options was tied and therefore, inconclusive, leaving a total of 36 observations with advice. In 63.9% of these observations, decisions of contestants were in line with the advice.

Notice that contestants make *ex post* “wrong” decisions when they accept offers lower than the prize inside their box or reject offers higher than the prize inside their box. The comparison of decisions with and without advice confirms the finding of Schotter (2003) that advice increases rationality. Particularly, when contestants do not have an opportunity to use advice or when the option of advice is available but not used, they make *ex post* “wrong” decisions in 52.9% and 54.6% of cases respectively. However, when they choose to consult the audience, the fraction of *ex post* “wrong” decisions decreases to 36.1%. Moreover, the *ex post* analysis of decisions with advice reveals that by following advice contestants increase their earnings (Table 1). Subjects make *ex post* “wrong” decisions in 46.2% of cases when they neglect the advice and only in 30.4% of cases when they follow the advice.

Out of 36 observations, in 24 (66.7%) cases the audience recommended the contestant to reject the offer. When the audience advised to accept (reject) the offer contestants made decisions in line with advice in 58.3% (66.7%) of cases, as shown in Table 2. The results of Ficher's exact test demonstrate that there is no statistically significant difference between the number of decisions consistent with advice “to accept” and the number of decisions consistent with advice “to reject” (p -value=0.4468).

Table 2
 Advice from the audience and decisions of contestants at different stages of the game ($N=36$)

Advice from audience	Decision of contestant	Total number of decisions	Number of cases when there are... unopened boxes left			
			Two	Five	Eight	Eleven
Accept	Accept	7	3	3	1	–
Accept	Reject	5	2	3	–	–
Reject	Reject	16	3	3	6	4
Reject	Accept	8	–	3	5	–

Table 3
Results of logit regression ($N=402$)

Explanatory variable	Description	Regression coefficient (standard error)	
Vote ($X1$)	Difference between the fraction of audience voting for accepting and rejecting the offer. Zero when no vote.	0.1231 (1.0146)	0.6461 (1.0868)
“Bank” offer ($X2$)	Natural logarithm of “bank” offer	0.1369*** (0.0353)	0.2480*** (0.0712)
Stage ($X3$)	Number of unopened boxed left	-0.4577*** (0.0593)	-0.4870*** (0.0759)
Offer/EV ($X4$)	“Bank” offer as a fraction of expected value of possible prizes		-0.3840 (0.9802)
Offer/asked ($X5$)	“Bank” offer as a fraction of the price asked by contestant ^a		-0.6416 (1.3306)
Region dummy ($X6$)	Zero for contestants from the region with the lowest income per capita (Calabria), 19 for the highest (Lombardia)		-0.0289 (0.0246)
Gender dummy ($X7$)	One for males, zero for females		-0.0248 (0.3079)
Marital status dummy ($X8$)	Zero for married, 1 for single, 2 for divorced, and 3 for widowed		0.2671 (0.2324)
Age ($X9$)	Self-reported age or estimate based on physical appearance		-0.0087 (0.0126)
Log-likelihood		-143.8289	-141.1729
McFadden’s likelihood ratio index		0.4838	0.4934
Veall and Zimmermann R^2		0.6910	0.6992

*** Significant at 0.001 significance level.

^a Before the “bank” makes an offer a contestant is asked to state a price that she is willing to accept for selling the content of her box.

Logit regression analysis is used to determine the impact of advice on the decisions of contestants. Probability that contestant $i \in \{1, \dots, 114\}$ accepts bank offer $j \in \{1, \dots, 4\}$ is given by

$$p_i^j = \frac{\exp\{\beta_1 X1_i^j + \beta_2 X2_i^j + \dots + \beta_9 X9_i^j\}}{1 + \exp\{\beta_1 X1_i^j + \beta_2 X2_i^j + \dots + \beta_9 X9_i^j\}}. \quad (1)$$

Explanatory variables $X1, \dots, X9$ are described in Table 3 and regression coefficients β_1, \dots, β_9 are estimated by minimizing log-likelihood function $LL = \sum_{ij} I_{ij} \ln p_i^j + (1 - I_{ij}) \ln(1 - p_i^j)$, where $I_{ij} = 1$ if contestant i accepted offer j and $I_{ij} = 0$ if contestant i rejected offer j .²

While regression results suggest that contestants are likely to follow advice, this trend does not appear to be statistically significant. Decisions of contestants are primarily influenced by the amount of money offered by the “bank” and the stage of the game, i.e. the number of unopened boxes that are left when the offer is made.

4. Discussion

This paper studies the impact of group advice on individual decision making in a natural experiment. In the television show *Affari Tuoi* contestants face a sequence of choices between a risky lottery with prizes

² Estimation was conducted in the *Matlab* 6.5 package and program files are available from the author on request.

up to €500,000 and a sure amount (“bank” offer). This paper analyzes whether the decisions of contestants are influenced by advice from the audience. It appears that advice has little impact on observed decisions although following advice is often beneficial for contestants. One can think of several possible explanations of these results.

In *Affari Tuoi* contestants realize that even though the advice they receive comes from a group of people, this advice is naïve, because the members of the audience have no direct experience with playing the game (even though they may have watched the show many times). Moreover, the tendency to neglect public advice may stem from the difference in incentives of contestant and the audience. While the primary goal of the contestant is to maximize the monetary prize, the audience is interested in watching an entertaining show. Obviously, the longer the contestant remains in the game (unless she eliminates all large prizes early), the more exciting is the show. Therefore, the audience has an incentive to recommend rejection of the monetary offer (which is observed in 2/3 of all cases in our data set).

A rational contestant knows that the audience is more likely to vote against acceptance of the offer and, therefore, discards the advice. This should imply that contestants are more inclined to follow advice when they are advised to accept the offer. However, this contradicts the fact that contestants make decisions in line with advice equally likely when they are recommended to accept and to reject the offer (Section 3). Therefore, it might also matter not only *which advice* the contestants receive, but also *when* they receive it (Table 2).

In the beginning of the game, when there are eleven unopened boxes left, monetary offers are typically well below the expected value of possible prizes. Therefore, it is not surprising that contestants always agree with the advice and reject the offer. When there are five unopened boxes left, the evidence is inconclusive, i.e. contestants follow the advice as many times as they deviate from the results of the vote.

The data from stages with two and eight unopened boxes are of particular interest. At the stage when there are eight unopened boxes left and “bank” offers are still considerably lower than the expected value of possible prizes, only ten contestants out of 109 have accepted monetary offers.³ Six of them have asked for an advice before making a decision. Therefore, it is plausible that if contestants ask for an advice at this early stage, they consider accepting the offer. In other words, these contestants are likely to be risk averse. In the last stage, when two unopened boxes are left, the monetary offers become very close or even converge to the expected value. Contestants, who have survived until this stage, are likely to be risk neutral or risk seeking.

If by asking for advice contestants try to justify their actions, risk averse (risk neutral or risk seeking) types should expect the audience to approve their acceptance (rejection) of the monetary offer. And if the audience and contestants have different incentives, and therefore, risk attitudes, contestants neglect advice. This is what we seem to observe in Table 2. When the audience advises risk averse contestants to accept the monetary offer in the early stages of the game, they willingly follow the advice. However, when the audience votes for rejecting the offer, contestants choose to neglect this advice in almost half of the cases. At the last stage of the game, when risk neutral (risk seeking) contestants receive an advice to reject the offer, they willingly follow the advice, using the chance to share responsibility for their decision with the members of the audience. However, if the vote results suggest accepting the monetary offer, almost half of contestants opt for rejecting the offer and continue the game.

³ All 109 contestants faced similar distribution of possible prizes (typically 4 small and 4 large prizes).

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