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Conformity in the lab

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Abstract We use a revealed preference approach to disentangle conformity, an intrinsic taste to follow others, from information-driven herding. We provide observations from a series of sequential decision-making experiments in which subjects *choose* the type of information they observe before making their decision. Namely, subjects choose between observing a private (statistically informative) signal or the history of play of predecessors who *have not* chosen a private signal (i.e., a statistically uninformative word-of-mouth signal). In our setup, subjects choose the statistically uninformative social signal 34 % of the time and, of those, 88 % follow their observed predecessors' actions. When allowing for payoff externalities by paying subjects according to the collective action chosen by majority rule, the results are amplifed and the social signal is chosen in 51 % of all cases, and 59 % of those who pick the social signal follow the majority choice. The results

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from the majority treatment demonstrate that conformist behavior is not driven by inequality aversion, nor by strategic voting behavior in which voters balance others who are uninformed. Raising the stakes five-fold does not eliminate conformist behavior; in both treatments, the social signal is chosen nearly 50 % of the time. Individual level analysis yields the identification of rules of thumb subjects use in making their decisions.

Keywords Conformity · Social learning · Strategic voting

JEL Classification C91 · D70 · D80

1 Introduction

Understanding the formation of herds is relevant to a variety of economic environments, ranging from voting behavior to fashion fads to financial market investments. The literature on herd formation is split into two strands. The psychology literature [see initial studies of Sherif (1937); Asch (1958)] suggests a preference-based explanation in which agents exhibit conformity, an intrinsic taste to follow others. In contrast, the economics literature [see Banerjee (1992); Bikhchandani et al. (1992)] has proposed an information-based model in which agents opt to ignore private signals and follow their predecessors' choices when the latter provide a stronger statistical indication as to the best course of action. In such a setting, agents who appear to be blindly following their peers may simply be best responding.

The goal of the current paper is twofold. First, to disentangle conformity from information based decision-making and inequality aversion. Specifically, to determine whether conformity plays a significant role in economic environments. Second, to establish the effects of institutions on the prevalence of conformist behavior. In particular, we explore the impacts of payoff externalities and incentive magnitudes on conformist behavior in the lab.

Our experimental design allows subjects to *choose* between observing a statistically informative signal and the history of choices of preceding players who themselves chose to observe the history of choices of predecessors who chose the history of choices, etc. That is, subjects choose between a statistically informative signal and a *pure word-of-mouth* signal. Within this framework, we study two aspects of subjects' decisions: whether they choose to observe the social word-of-mouth signal and whether, upon choosing such a signal, they follow the more popular action.

In our experiments, a significant percentage of subjects choose to observe the social information. Upon observing the social information, a significant majority of subjects choose the prevalent action observed. Externalities, learning, or increased stakes do not mitigate the results. In particular, the motives to "conform" appear to outweigh both individual and strategic voting motives.

There are several experimental contributions to the literature on information cascades that tie directly to the current paper.[1] Our experimental design is similar in spirit to that used in Anderson and Holt (1997) and Hung and Plott (2001) in order to test experimentally the original informational cascade model of Bikhchandani et al. (1992). Ultimately, both these papers illustrate the prevalence of cascades and their sensitivity to the institution used to aggregate group choices.[2] However, in these papers both social and statistical information are always provided and are not objects of choice.

Our paper also relates to a few recent papers exploring information acquisition in the context of social learning. For instance, in Çelen and Hyndman (2012), subjects often paid a fee to observe another agent's action that held information that was not useful. This is consistent with our results. In fact, we illustrate that even when predecessors' actions hold *no information* at all, agents are willing to forego statistical information in order to observe historical choices. See also Kübler and Weizsäcker (2004) and work that followed.[3]

Last, our paper contributes to the literature on imitation. Some of that literature *assumes* agents mimic successful others and analyzes the likely outcomes [see, e.g., Vega-Redondo (1997) and references therein]. Furthermore, several papers have inspected experimentally the tendency of subjects to mimic successful agents, mostly in the context of oligopolistic competition [see, for instance, Offerman et al. (2002); Apesteguia et al. (2007)]. While that literature often uses evolutionary forces as a justification for agents' following others who have done well, the current paper suggests agents' taste for following others, even absent any performance information.

2 Experimental design

The underlying experimental design is as follows. There is a "red" jar and a "blue" jar: the red jar contains seven red and three blue balls and the blue jar contains seven blue and three red balls. At the start of each period, one of the jars is chosen by a toss of a fair coin. The goal of the subjects is to guess the jar that has been chosen.[4] Specifically, subjects make their guesses sequentially as follows:

[1] For general surveys of social learning, see Gale (1996), or Bikhchandani et al. (1998).

[2] In particular, under majority rule, Hung and Plott (2001) illustrate that fewer cascades form. They also run a session in which subjects were directly given incentives to conform and indeed observe higher rates of cascades there. Drehmann et al. (2007) replicate some of these results with a larger subject pool and introduce some forms of network externalities in which agents' payoffs depend on the actions chosen by a subgroup of subjects. Interestingly, when decision values are endogenous, as in financial markets with flexible prices, Drehmann et al. (2005) illustrate that herding may not play a very important role.

[3] In Kübler and Weizsäcker (2004) subjects faced common uncertainty and were required to decide sequentially whether to make an investment whose return depended on the common realization of uncertainty. In addition to observing their predecessors, subjects had access to a costly information source. Subjects invested excessively in information relative to equilibrium predictions. Interestingly, when we pose the choice in terms of information sources, subjects choose too little statistical information for payoff maximization.

[4] Thus, the basic structure is reminiscent of the designs of Anderson and Holt (1997); Hung and Plott (2001).

Table 1 Experimental design

Treatment	Stakes	Number of sessions	Number of subjects
Individual	Low ($1, $0.1)	5	72 = 15 + 15 + 15 + 15 + 12
Individual	High ($5, $0.5)	3	45 = 14 + 15 + 16
Majority	Low ($1, $0.1)	4	58 = 15 + 15 + 15 + 13
Majority	High ($5, $0.5)	3	43 = 15 + 15 + 13

Subjects 1–3 (history condition) each observes her predecessors' actions and no other information before making her guess.

Subjects 4 and on (choice condition) each gets to choose whether to observe *history*, the actions chosen by all agents who were in the *history* condition (by choice or by design), or a *private signal*, as manifested by a draw with replacement from the selected jar. The decisions of those that choose private signal are *not* recorded in *history*, which captures only the decisions of those that choose *history*.

Thus, starting from subject 4, each subject faces a choice between a (statistically uninformative) word-of-mouth signal and a (statistically informative) private signal. This process is repeated for 10 periods. In each period, subjects' locations in the sequence are randomly determined.

There are two treatments: *Individual Choice* and *Majority Choice*, which we now describe.

Individual Choice There are no payoff externalities between subjects' guesses. Each subject receives $1 if she correctly guesses the chosen jar and $0.10 otherwise.

Majority Choice We determine the jar that got a (simple) majority of guesses at the end of each period and give *all* subjects $1 if the majority guess is correct and $0.10 otherwise.

In order to examine the effects of incentive size, we also repeated our two treatments with stakes that were 5 times higher. That is, $5 for correct (individual or majority) guesses and $0.50 for incorrect ones.[5] In addition, subjects were paid $5 for showing up. To summarize, our experiments followed a 2×2 design, where the existence of payoff externalities (individual or majority choice) and the size of the stakes were varied.

Sessions were run at the California Social Science Experimental Laboratory (CASSEL) at UCLA, with a total of 218 subjects.[6] Table 1 summarizes the set of experimental sessions for each of the treatments (the number of subjects is described as a sum, where summand i corresponds to the number of subjects used in session i of the relevant treatment). On average, subjects were paid $11.11 and $31.00 in the individual treatments under low and high stakes, respectively, and $12.48 and $32.29 in the majority treatments under low and high stakes, respectively.

[5] We note that the $1–$0.10 stakes are actually of standard magnitude used in the social learning experimental literature in recent years [see, e.g., Çelen and Kariv (2004); Hung and Plott (2001); etc.].

[6] We used the z-tree software [see Fischbacher (2007)] to program all of our experimental treatments. The slides used during the instruction phase of the experiments can be found in the online supplementary material.

3 Predictions

Maximization of expected payoffs in the individual choice treatments would entail all agents choosing a statistically informative signal when having the option to do so, and following their signal with their guess. That is, choosing the red jar if a red ball was sampled, and choosing the blue jar otherwise. Consequently, our first hypothesis is:

Hypothesis 1 (Informational Herding) The fraction of subjects choosing *history* in the individual treatment is zero.

While in the individual choice treatments the optimal and dominant payoff maximizing behavior is to observe the statistical signal and follow it, more subtle strategic considerations arise in the majority treatments. Intuitively, conditional on choosing *history* under the majority treatment, strategic subjects aiming at maximizing their monetary payoffs should try to balance out the uninformed choices by going against the majority choice. This way, the informed subjects, who observe a private signal prior to voting, will have stronger voting power. Indeed, the intuition driving some of the underlying results in the strategic voting literature [see, e.g., Feddersen and Pesendorfer (1996)] suggests that sophisticated subjects who realize some of their peers select history of play and blindly follow the majority, may have an incentive to choose history of play and go *against* the majority.

Let n denote the odd number of voters. Suppose individuals 1 trough $n-2$ have chosen history of play and the vote lead for one of the options is 1.[7] The next-to-last voter can either select history to balance the vote count or vote on the basis of a private signal. In the former case, the final voter chooses a private signal and votes accordingly, and the probability with which the group is correct is equal to the signal precision $q = 0.7$. In the latter case, the final voter is indifferent between choosing history to balance the vote count of those that chose history or choosing a private signal and voting accordingly: either way the probability with which the group is correct is $q = 0.7$. [8] To summarize, there may be an even or odd number of voters choosing history but there will be at least one voter who votes according to a private signal. This example provides the intuition for the following characterization of informative equilibria, i.e. equilibria in which some statistical information is utilized.[9]

Proposition (Equilibria Characterization) *In any informative equilibrium, at least one subject votes according to a private signal. Subjects choosing to observe history balance their votes such that neither option has a vote lead of more than 1.*

Clearly, the most efficient equilibrium entails at most one subject *choosing* to observe history in the majority treatment (the first three subjects observe history by design). This holds even if subjects are inequality averse, unlike in the individual treatment. Consequently,

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[7] If the vote lead for either alternative is 3 or more after these $n-2$ votes, the majority is determined and the probability with which the group selects the correct alternative is only 0.5.

[8] When the final two voters choose private signals the chance that the group is correct is $\frac{1}{2}q^2 + \frac{1}{2}(q^2 + 2q(1-q)) = q$, where the first (second) term on the left side corresponds to the case where the (in)correct option has a vote lead of 1 among those that chose history.

[9] In addition to the informative equilibria characterized by the proposition there also exist uninformative equilibria, e.g., everyone choosing a statistical signal and then voting blue.

Hypothesis 2 (Efficiency) At most one of the subjects succeeding the first three chooses history.

Subjects may not be following the most efficient equilibrium, but still behave in a sophisticated manner. The Proposition suggests that history profiles should be (almost) balanced in *any* equilibrium, so that the power of vote is given to those who are statistically informed. Thus, we can test for strategic sophistication through the following Hypothesis.

Hypothesis 3 (Strategic Voting) In the Majority Choice treatment, history profiles are (almost) balanced, i.e., neither option has a vote lead of more than 1.

4 Results: aggregate data

The focus of our study pertains to agents' choice of information. Since subjects 1–3 were provided the history of actions and not given a choice regarding what information they desired, any choice of action by those subjects generated the same expected payoff. We therefore restrict most of the analysis that follows to the decisions taken by subjects 4 and on in the sequence. The final decisions in all periods of the individual choice treatments translate into 570 decisions with low stakes and 360 decisions with high stakes. In the majority treatments, there were 460 decisions in periods 4 and on of the low stakes sessions and 340 decisions in the corresponding periods of the high stakes sessions.

We start by analyzing choices of information. In particular, we study the effects of externalities on information choices, as well as rule out explanations such as inequality aversion for the apparent conformist behavior observed in the lab. We then investigate behavior of subjects choosing to observe the uninformative actions of others. This allows us to identify the extent of sophisticated game theoretic behavior in the voting context.

4.1 Information choices

The upper panel of Table 2 summarizes the results from the individual choice treatments. As can be seen, 34 % of the subjects in the low stakes sessions and 50 % of the subjects in the high stakes sessions chose to observe history, and both these figures are significant at any reasonable level. Restricting the data to the last four periods in all sessions does not produce significantly different levels of history choices, suggesting our results are not driven by confusion nor are they significantly mitigated by learning. In fact, we were particularly concerned about subjects' confusion. At the end of each session, we asked subjects to explain in their own words the strategies used in the experiment. We then employed a research assistant to try and ascertain which subjects appeared confused.[10] Using a harsh criterion of classifying a subject as confused if *anything* in his or her description is inaccurate,

[10] Confusion could be either about the information contained in each initial choice (private signal or history) or about other aspects of the design (the underlying uncertainty, the optimal actions, etc.).

Table 2 Aggregate statistics

Treatment	Stakes	Fraction of history choices		Average profit per period	Potential profit per period
		Periods 1–10	Periods 7–10		
Individual	Low ($1, $0.1)	0.34 (0.02) t = 17.14	0.32 (0.03) t = 10.24	$0.61 (0.02)	$0.72 (0.02)
	High ($5, $0.5)	0.5 (0.03) t = 19.23	0.44 (0.04) t = 10.55	$2.65 (0.12)	$3.65 (0.12)
Majority	Low ($1, $0.1)	0.51 (0.02) t = 21.71	0.48 (0.04) t = 13.09	$0.75 (0.02)	$0.98 (0.004)
	High ($5, $0.5)	0.43 (0.03) t = 16.38	0.41 (0.04) t = 9.72	$2.72 (0.12)	$4.40 (0.08)

Numbers in parentheses correspond to standard errors

history choices remain above 15 % across all sessions and significantly greater than 0.[11] We therefore reject Hypothesis 1.

There are several points to note. First, subjects incurred significant monetary losses by selecting to observe history. Indeed, the per-period average loss relative to potential per-period returns (achieved if subjects were to observe statistical signals and follow them) was 10¢ in the low stakes treatment and $1 in the high stakes treatment. Particularly in the high stakes sessions, these losses translate into subjects forgoing a significant portion of their experimental wage.

Second, and somewhat puzzling to us, is the fact that conformist behavior is more frequent in the high-stakes treatment (although the difference is not significant at the 5 % level using a Wilcoxon two-sample test). This is intriguing in view of the amount of money left on the table in both treatments and reminiscent of the type of payoff insensitivity observed in other social learning experiments.[12]

Of the subjects who choose to observe the statistical signal, most behave nearly optimally. Indeed, 91 % (92 %) follow the guess corresponding to the observed signal in the low (high) stakes treatment.

While the data from our individual choice treatments is consistent with subjects acting on conformist motives, i.e. an intrinsic taste to follow others, they are also consistent with a form of *inequality aversion*. That is, if subjects are averse to receiving either higher or lower payoffs than some function of the moments of the experimental distribution as in Fehr and Schmidt (1999), they may indeed be willing to forego statistically useful information as observed. The majority treatments offer a clean control for any form of inequality aversion as all subjects within a specific session received the *same exact* payoff. The bottom panel of Table 2 contains the aggregate statistics pertaining to the majority treatment.

[11] See the online supplementary material for further details on the analysis of confusion.

[12] Anderson (2001) systematically varies the payoff scale in social learning experiments similar to ours (in her experiment all subjects receive a statistical signal by design). She finds no systematic effects of changing payoff magnitudes unless the incentive payments are removed entirely.

Clearly, the number of history choices among those who had a choice was significantly greater than 1 for both the low stakes and the high stakes sessions, at any reasonable confidence levels. In the low stakes sessions, 51 % of the decisions entailed the observation of history, while for the high stakes sessions, the analogous figure is 43 % (both of the same order of magnitude as observed in the high stakes individual treatments). As before, these observations are robust to restricting the data to the last four periods within each session. Furthermore, both the mean and the median number of history choices per group decision was 9 in the low stakes sessions and 8 in the high stakes sessions (see Table 4). Thus, Hypothesis 2 is rejected. Upon choosing to observe a statistical signal, agents follow the signal with high percentages: 96 % in the low stakes condition and 91 % in the high stakes condition. Thus, the deviation from equilibrium behavior cannot be explained by the choices made by subjects who observe the statistical signals. In summary, our results cannot be explained by an inequality aversion model, nor do the subjects seem to be playing the most efficient equilibrium.

It is worth noting that within each group, subjects had the potential for significant collective information (with 15 subjects there are 12 signals of accuracy $q = 0.7$). In particular, the gap between the average per-period payoff and the potential per-period payoff that would have been generated had subjects collectively followed the most efficient equilibrium strategies is even starker than in the individual treatments. In the low stakes treatments this gap is 23¢, while in the high stakes treatment, the gap is $1.68 per period!

4.2 Behavior within the history condition

The previous section attested to subjects having some taste for observing others' actions. This can stem from a variety of underlying reasons–it may be a manifestation of curiosity, of a sensible rule of thumb, etc. We now inspect more carefully subjects' choices within the history condition.[13] Table 3 reports frequencies of subjects who have observed the social signal and chose the prevalent action among observed predecessors (i.e., the action that a strict majority of prior subjects who observed the social signal had chosen), when such an action existed.

The top panel of the table describes the behavior of the second and third subjects in the sequence. These were subjects who were forced into the so-called history condition. They received no statistical information, but observed their predecessors' actions. Table 3 illustrates the probability that the second subject chose an action coinciding with the first's, as well as the probability that the third subject chose an action coinciding with the actions of the first two players, when those were identical.

In the individual treatment, absent any statistical information, following predecessors or not generates identical expected values. Interestingly, subjects follow others with a probability that is significantly different than 50 %, that would

[13] Note that while curiosity-type theories may help explain the *choice* of social information, they do not generally imply anything about choices *conditioned* on having observed the social signal.

Table 3 Frequencies of followers within history

Order	Individual treatment		Majority Treatment	
	Low stakes	High stakes	Low stakes	High stakes
Second in sequence	0.72 (0.06) t1 = 3.46, t2 = 11.34,	0.5 (0.09) t1 = 0, t2 = 5.48	0.48 (0.08) t1 = 0.32, t2 = 6.02	0.57 (0.09) t1 = 0.74, t2 = 6.26
Third in sequence	0.58 (0.08) t2 = 1.01, t2 = 7.10	0.8 (0.10) t1 = 2.90, t2 = 7.75	0.47 (0.11) t1 = 0.23, t2 = 4.14	0.59 (0.11) t1 = 0.74, t2 = 4.92
Four and on	0.88 (0.02) t1 = 15.71, t2 = 36.67	0.84 (0.03) t1 = 12.37, t2 = 30.39	0.59 (0.04) t1 = 2.64, t2 = 17.13	0.70 (0.04) t1 = 5.04, t2 = 17.75

Numbers in parentheses correspond to standard errors

t1 and t2 are t-statistics regarding differences from 0.5 and 0, respectively

Table 4 Characteristics of history profiles

Stakes	Individual—number of subjects choosing history														Mean
	0	1	2	3	4	5	6	7	8	9	10	11	12		
Low ($1, $0.1)	4	2	4	9	14	5	8	4	0	0	0	0	0		3.88
High ($5, $0.5)	0	0	1	4	4	7	1	4	3	3	3	0	0		6
	Individual—absolute difference between choices within history														Mean
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
Low ($1, $0.1)	1	3	5	9	6	9	2	8	4	1	2	0	0	0	4.76
High ($5, $0.5)	0	3	4	3	2	0	7	1	3	2	0	1	2	2	6
Stakes	Majority—number of subjects choosing history														Mean
	0	1	2	3	4	5	6	7	8	9	10	11	12		
Low ($1, $0.1)	0	0	0	0	1	3	3	2	6	9	7	5	4		8.8
High ($5, $0.5)	0	0	0	0	0	1	3	6	10	8	2	0	0		7.9
	Majority—absolute difference between choices within history														Mean
	0	1	2	3	4	5	6	7	8	9	10	11	12		
Low ($1, $0.1)	0	7	3	2	5	6	7	2	2	1	4	1	0		5.0
High ($5, $0.5)	1	5	6	1	5	5	1	4	2	0	0	–	–		3.8

be generated by random choice (the reported $t1$ is the t-statistic corresponding to the difference between observed behavior and random choice). In the majority treatments, subjects potentially have an efficiency incentive to balance out predecessors' votes. While in these treatments probabilities of conforming with predecessors are not significantly different from those generated by random choice, they are certainly significantly different from 0, which would be derived if subjects were engaged in "balancing out" preceding subjects (the reported $t2$ is the t-statistic corresponding to the difference between observed behavior and contrarian behavior, i.e., going against the prevalent observed action).

The bottom panel of Table 3 reports the frequencies of following the prevalent action within history for subjects who *chose* the social signal. While the behavior is similar qualitatively to that of the second and third subjects in the sequence, rates of following are greater. Indeed, in the individual treatments, subjects followed the more common action with 84–88 % Within the majority treatments, these probabilities are lower. Nonetheless, subjects follow others with probability that is significantly greater than 50 % and certainly do not behave in a fully contrarian manner as the informative equilibria suggest.[14]

Table 4 contains more information on the distribution of history lengths in each treatment. The lower panels in each of the segments of Table 4 summarize the results regarding the frequency of all possible differences between choices of Red and Blue. In the individual treatments, under the low stakes, only one history is balanced, and 3 out of 50 profiles have an imbalance of one vote. Under the high stakes, no history profile is balanced, and 3 of 30 profiles have an imbalance of one vote.

Similarly, in the majority treatments, under low stakes, no history profile is balanced and only 7 out of 40 have an imbalance of one vote. Under the high stakes treatment, 1 out of 30 profiles ends up being balanced and 5 out of 30 have an imbalance of precisely one vote. In fact, the mean absolute difference between the two possible guesses under the low stakes treatment is 5, while under the high stakes treatment it is 3.8. On the individual level, these are consistent with the observations reported in Table 3 regarding contrarian behavior within history. In summary, Hypothesis 3 is rejected.

The extent to which there is imbalance within the history profile is certainly related to the length of history. For one, this difference is bounded by the number of subjects choosing to observe history overall. Figure 1 illustrates the link between the observed imbalance and the length of history profiles. In particular, for any number of subjects choosing to observe history, the figure illustrates the average imbalance of votes within the history profile. One can see that longer histories are characterized by lower rates of "almost balanced" histories.[15]

5 Individual analysis

We now turn to the individual analysis of our data. Figure 2 depicts the distribution of individual frequencies pooled from all treatments. As can be seen, there are

[14] Corrazzini and Greiner (2007) note similar comparative statics regarding the tendency to follow other uninformed subjects as it depends on location within the sequence. Goeree and Yariv (2011) report consensual decisions in collective action settings when subjects are all informed and can communicate. Related to these observations, they show that subjects who have dominated actions often vote with the majority, against their preferences.

[15] This is consistent with the original conformity experiments reported in Asch (1958) in which the number of confederate subjects reporting a wrong answer affected positively the propensity of the real subjects to follow suit.

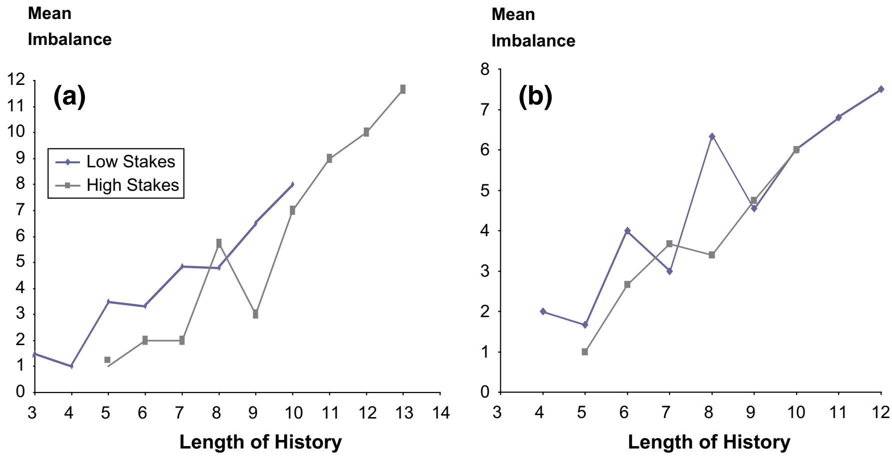

Fig. 1 Mean imbalance as a function of the number of subjects choosing history **a** and **b** corresponding to individual and majority treatments, resepctively

significant masses of subjects at the extremes, choosing either to observe the statistical signals or the uninformed historical choices nearly always. The distributions corresponding to the different treatments are similar in shape. For instance, in the low stakes sessions, in the individual treatments, 35 of 72 subjects chose to observe the social history no more than 25 % of the time, while 10 of 72 subjects chose to observe the social history no less than 75 % of the time. In the majority treatments, 20 of 58 subjects chose to observe the social history no more than 25 %v of the time, and 20 of 58 chose to observe the social history no less than 75 % of the time.[16]

One simple heuristic that seems to be used by our subjects relates to their location within the sequence. Indeed, subjects appear to be more prone to observe the word-of-mouth uninformative signal the further they are in the sequence. Figure 3 depicts the frequency of history choices as a function of the location of subjects within the treatments, as well as the estimated line corresponding to the pooled data from all treatment (of slope 0.031 ± 0.003).

The correlation between history choices and the location within the sequence of decision makers does not differ significantly across treatments and sessions.[17] The upward trend apparent in Fig. 3 provides further evidence for conformist behavior. If agents possess an intrinsic taste to follow others and, say, care about the action

[16] It is worth noting that neither gender nor academic major had significant explanatory power regarding individual choices.

[17] Linear or probit regressions yield similar confirming results. Consider the low stakes sessions. In the Individual Choice treatment, regressing a choice dummy (1 when history was chosen, 0 when a private signal was chosen) on location yields a coefficient of 0.033 ± 0.006 while in the Majority Choice treatment this coefficient is: 0.034 ± 0.007. Similarly, for the high stakes treatments the corresponding coefficients are 0.025 ± 0.007 for the Individual Choice treatment and 0.027 ± 0.008 for the Majority Choice treatment.

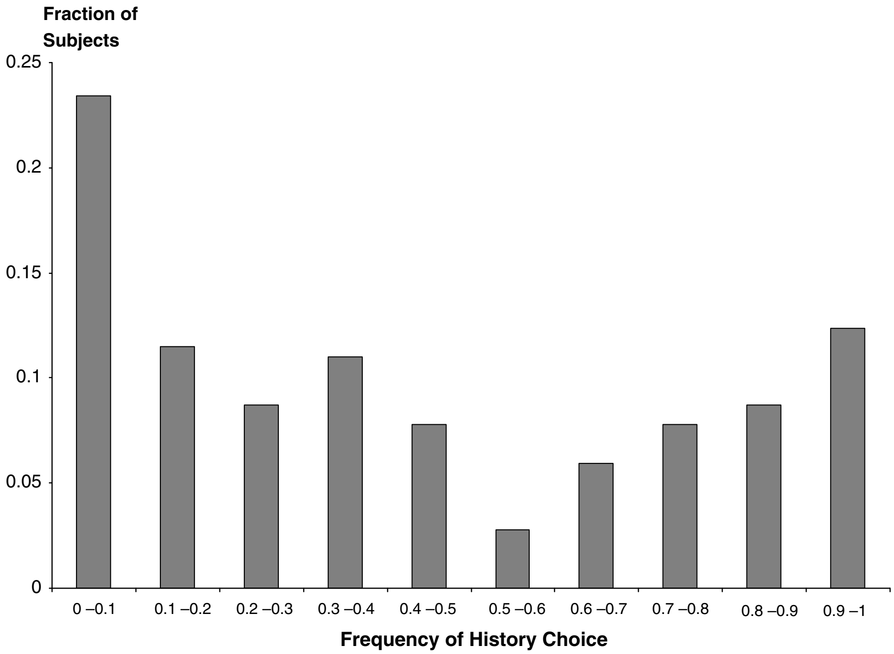

Fig. 2 Distribution of individuals according to frequency of history choices

taken by a majority of their peers, the value of looking up the social history of actions indeed increases later in the sequence of play.

6 Conclusions

Using a revealed preference approach, we allowed subjects to *choose* between social information void of any instrumental value and an informative statistical signal. A large fraction of subjects choose to observe the social information, and subsequently follow the prevalent action observed. Furthermore, the motives to "conform" appear to outweigh both individual and strategic voting motives.

While the high percentage of agents turning down statistical information is consistent with the notion of conformity, there are two leading alternative explanations we contemplated. First, the behavior could be explained with a model of inequality aversion [e.g., Fehr and Schmidt (1999)]–if subjects have an intrinsic aversion to getting payoffs that are at the tails of the payoff distribution, others' previous choices may be useful in ascertaining their optimal actions. Our voting treatments are designed to control for such motives. Subjects in those sessions are paid *identical* amounts determined according to whether the *majority guess* matched the underlying state or not. In these sessions, about 50 % of the subjects turned down the informative signal, implying that inequality aversion per-se is not at the root of our results. The second potential explanation for the behavior we observe is

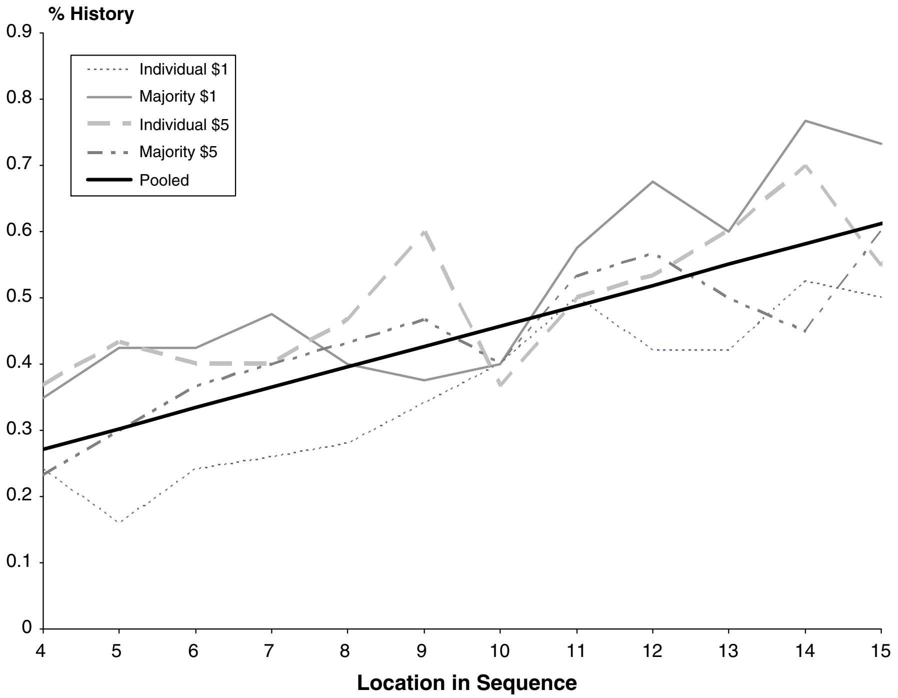

Fig. 3 Fraction of individuals choosing history as a function of location in the sequence

confusion of our subjects about the experimental setup. In order to address this, we asked subjects post-experimental questions regarding their behavior. A large majority of subjects reported answers that are in line with the experimental incentives in place. Furthermore, restricting our analysis only to those subjects who did not report answers suggesting *any* level of confusion generates qualitatively identical results.

Following others may be a very sensible rule of thumb in many contexts of real life and so may make sense as a decision making short-cut in various circumstances. Nonetheless, in many situations, this rule of thumb may be rather costly in terms of individual payoffs [as when considering stock market investments or forecasting, see e.g. Clement and Tse (2005)] or collective welfare [as in elections, see Agranov et al. (2014)], and suggests a potential new read of some of the germane empirical literature.

References

Agranov, M., Goeree, J.K. Romero, J., Yariv L. (2014) What makes voters turn out: the effects of polls and beliefs, mimeo.

Anderson, L. (2001). Payoff effects in information cascade experiments. *EconomicInquiry*, *39*(4), 609–615.

Anderson, L.R., & Holt, C.A. (1997). Information cascades in the laboratory. *American Economic Review*, *87*(5), 847–862.

Apesteguia, J., Huck, S., & Oechssler, J. (2007). Imitation—theory and experimental evidence. *Journal of Economic Theory*, *136*(1), 217–235.

Asch, S.E. (1958). Effects of group pressure upon the modification and distortion of judgements. In E.E. Maccoby, T.M. Newcomb, and E.L. Hartley, (eds.), *Readings in social psychology*. (pp. 174–183). New York: Holt.

Banerjee, A.V. (1992). A simple model of herd behavior. *Quarterly Journal of Economics*, *107*(3), 797–817.

Bikhchandani, S., Hirshleifer, D., & Welch, I. (1992). A theory of fads, fashion, custom, and cultural change as information cascades. *Journal of Political Economy*, *100*(5), 992–1026.

Bikhchandani, S., Hirshleifer, D., & Welch, I. (1998). Learning from the behavior of others: conformity, fads, and informational cascades. *Journal of Economic Perspectives*, *12*(3), 151–170.

Çelen, B., & Hyndman, K. (2012). Social learning through endogenous information acquisition: an experiment. *Management Science*, *58*(8), 1525–1548.

Çelen, B., & Kariv, S. (2004). Distinguishing informational cascades from herd behavior in the laboratory. *American Economic Review*, *94*(3), 484–497.

Clement, M.B., & Tse, S.Y. (2005). Financial analyst characteristics and herding behavior in forecasting. *The Journal of Finance*, *60*(1), 307–341.

Corrazzini, L., & Greiner, B. (2007). Herding, social preferences and (non-) conformity. *Economics Letters*, *97*(1), 74–80.

Drehmann, M., Oechssler, J., & Roider, A. (2005). Herding and contrarian behavior in financial markets—an internet experiment. *American Economic Review*, *95*(5), 1403–1426.

Drehmann, M., Oechssler, J., & Roider, A., (2007). Herding with and without payoff externalities—an internet experiment. *International Journal of Industrial Organization*, *25*(2), pp. 391–415.

Feddersen, T.J., & Pesendorfer, W. (1996). The swing voter's curse. *American Economic Review*, *86*(3), 408–424.

Fehr, E., & Schmidt, K.M. (1999). A theory of fairness, competition and cooperation. *Quarterly Journal of Economics*, *114*(3), 814–868.

Fischbacher, U. (2007). z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics*, *10*(2), 171–178.

Gale, D. (1996). What have we learned from social learning? *European Economic Review*, *40*(3–5), 617–628.

Goeree, J., & Yariv, L. (2011). An experimental study of collective deliberation. *Econometrica*, *79*(3), 893–921.

Hung, A., & Plott, C.R. (2001). Information cascades: replication and an extension to majority rule and conformity-rewarding institutions. *American Economic Review*, *91*(5), 1508–1520.

Kübler, D., & Weizsäcker, G. (2004). Limited depth of reasoning and failure of cascade formation in the laboratory. *Review of Economic Studies*, *71*, 425–441.

Offerman, T., Potters, J., & Sonnemans, J. (2002). Imitation and belief learning in an oligopoly experiment. *Review of Economic Studies*, *69*(4), 973–997.

Sherif, M. (1937). An experimental approach to the study of attitudes. *Sociometry*, *1*, 90–98.

Vega-Redondo, F. (1997). The evolution of Walrasian behavior. *Econometrica*, *65*(2), 375–384.