

## Lay Understanding of Macroeconomic Causation: The Good-Begets-Good Heuristic

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The functioning of the economic system is complex and technical. For its part, the public is constantly presented with information on economic causality. It is important for its members to assimilate this information, whether to further their personal goals or to engage advisedly in the democratic process. We presented economically untrained and trained participants with questions of the form: "If *variable A* increases, how will this affect *variable B*?" for all the combinations of 19 key economic indicators. Economically untrained participants were willing to commit themselves on most questions, despite their medium to low self-report of understanding the concepts involved. Analysis of the pattern of responses reveals the use of a simple shortcut, the good-begets-good heuristic, which yields a sense of competence in the absence of understanding of the causal mechanism involved.

Le fonctionnement du système économique est complexe et technique, et le public est constamment confronté à des informations se référant à une causalité économique. Il est important que le public les assimile, que ce soit pour poursuivre ses buts personnels ou pour participer en connaissance de cause au processus démocratique. Nous avons présenté à des sujets, ayant bénéficié ou non d'une formation en économie, des questions sous la forme: "Si la variable A augmente, comment cela affectera-t-il la variable B?" pour toutes les combinaisons possibles de 19 indicateurs économiques clés. Les sujets sans formation économique étaient disposés à prendre position sur la plupart des questions, malgré une auto-évaluation assez basse quant à leur compréhension des concepts impliqués. L'analyse de la structure des réponses révèle l'utilisation d'un simple raccourci, l'heuristique "le bien engendre le bien", ce qui leur donne un sentiment de compétence alors qu'ils ne comprennent pas le mécanisme causal en jeu.

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## INTRODUCTION

The functioning of the economic world is complex and technical. For its part, the public is constantly presented with information on economic causality. This paper investigates the causal network linking economic indicators endorsed by people without economic training.

In democracies, policies are heavily influenced by the views and beliefs of the public. This raises a problem when the beliefs of the public are at variance with those of specialists. How can a democracy function, it may be asked, when the public does not understand the issues at stake? Two domains where these questions have been raised are politics and economics (Carpini & Keeter, 1997; Gilens, 2005; van Bavel & Gaskell, 2004). The two are also related, in view of the importance of economics for elections (Lewis-Beck, 1988; Lewis-Beck & Rice, 1992).

Individual attitudes, preferences, and behaviors are moderated by levels of factual information about relevant stimulus objects (Hausman, 1992). In the domain of economics that will concern us here, most previous studies have focused on knowledge of facts and on valuation and attitudes towards the economy. Significant differences between the public and professional economists have been noted. Blendon et al. (Blendon, Benson, Brodie, Morin, Altman, Gitterman, Brossard, & James, 1997) report the results of two surveys, one of economists, the other of the public, and find that the public has a bleaker picture of what has happened economically to the average family and is more pessimistic than most economists about the intermediate future. The public also cite different reasons than economists do for why the economy is not doing better. Further studies suggest that economic beliefs of economists and of the public differ systematically. The relative importance ascribed by the respondents to economic factors diverges. Economists, for instance, consider foreign trade and downsizing as helpful, accept supply and demand explanations rather than monopolistic explanations of price changes more than people without a background in economics. Additional studies of lay understanding of economics have concentrated on the effects of various psychological, social, and economic traits with factors such as education, income or job security affecting their outlook (Allen, Ng, & Leiser, 2005; Bastounis, Leiser, & Roland-Lévy, 2004; Caplan, 2001; Forgas, Morris, & Furnham, 1982; Lewis, Snell, & Furnham, 1987; Link, Schwartz, Moore, Phelan, Struening, Stueve, & Colten, 1995; Walstad & Rebeck, 2002; Zucker & Weiner, 1993). In particular, economic training, as may be expected, is a significant factor, and Caplan (2007) derives far-reaching consequences for the democratic process from these disparities.

A different perspective on lay understanding of economics relies on the social representations approach to discover relations between concepts. Social representations are defined as socially shared ideas, opinions,

attitudes, and theories (Moscovici, 1981, 1984). They are influenced by public discourse (electronic mass media, newspapers, schools, the discourse of politicians and so forth), yet have also their own coherence. Social representations affect the diffusion of the normative theories elaborated and used by professionals, distorting and modulating them while assimilating them (Leiser & Drori, 2005; Vergès, 1989).

In the present study we adopt yet a different approach. We examine the causal network formed by economic concepts according to laypeople, and compare it with that of economists. We will study the presence and direction of causal relations between pairs of variables in lay understanding of economic causation. A limitation in our study should be acknowledged at the outset. Causal relations, especially in economics, do not form a network of simultaneous relations, and the causal system they form plays out over time. We will ignore the temporal dimension in our study.

### THE PSYCHOLOGICAL STRUCTURING OF CAUSALITY IN MACROECONOMICS

Macroeconomics studies the economic functioning of a country as whole, what is often called the behavior of the aggregate economy. The markets for goods and for services, the labor, the financial and currency markets are all interrelated. Macroeconomics examines economy-wide phenomena such as changes in unemployment, inflation, and price levels. To evaluate the global performance of an economy, aggregate indexes are used: the GDP and its growth rate, the inflation rate, the unemployment level, and so on. Economic science develops models of the interactions between these indexes. Those models are complex, often relying on mechanisms of re-equilibration.

While professional arguments are exceedingly technical, the discourse on economics is not restricted to specialists only, as is largely the case with engineering, for instance. They are often explained in pieces intended for the public. One can read them in mass-circulation newspapers, where the evolutions of the stock market, or the rationale for the decisions of the central bank, are discussed. The public can also read popular columns with titles such as “How to invest your money?” which typically contain a mix of analysis and advice.

What do laypeople make of such reports? In view of the complexity of the causal relations in economics, it seems doubtful that they really understand it. As Arthur (2000) stresses: economics is inherently difficult. If the public tries to make sense of it nonetheless, it must impose some simpler structure or rely on heuristics. This is the claim we will examine.

In a preliminary study, we presented 54 undergraduate students with the names of 36 economic variables on index cards, such as the rate of economic growth, inflation rate, savings rate, and asked them to form as many pairs as

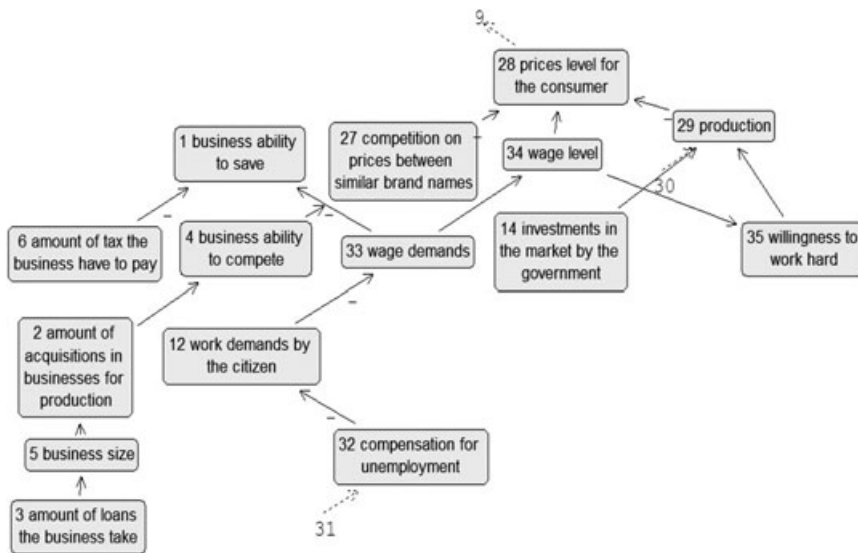


FIGURE 1. A fragment of the causal map of one participant in the pilot study.

they could, such that one of the variables causes an increase or a decrease in the other. For example, a subject might judge that an increase in income would provoke an increase in consumption, and also in savings. Such directed relations can then be combined in a causal map (Axelrod, 1976; Eden, Ackermann, & Cropper, 1992; Laukkanen, 1996, 1998). The resulting maps are complex. Figure 1 shows a small part of the network of relations expressed by one of the participants in that study. The present study will use a more structured methodology to the study of such mental maps.

## METHOD

### Participants

Our purpose is to analyse causal structuring by intelligent laypersons. The focal group was composed of 42 first-year students in psychology at Ben-Gurion University, Israel (mean age 22.3 years, 12 males and 30 females). They engaged in the experiment as part of their course duties. These participants were economically naïve participants, and had no previous formal exposure to economic theory whether in high school or in college.

In order to have a benchmark of trained economists, we used a second group consisting of economically educated participants. That group was

composed of 18 students in their last (3rd) year of bachelor's degree in economics at the same institution (mean age 24.6, six males and 12 females). The difference in age is small compared to the extensive life experience students have in Israel by that age. Data collection was towards the end of the academic year, so these students were nearing completion of their BA in economics. This group serves to represent the academic economic knowledge imparted to students. Both groups have high SAT scores (85th percentile), which is a precondition for enrollment in their respective programs of study.

## Procedure

The participants responded to a self-paced computer administered questionnaire in individual booths. The main part of the questionnaire consisted of judgments on the causal links between pairs of economic values. We selected 19 central economic variables, listed in Table 1, on the basis of the pilot study mentioned above and of the advice of an economist.

The questions followed a fixed format: If *variable A* increases, how will this affect *variable B*? For example: If the *unemployment rate* increases, how will this affect *the inflation rate*?<sup>1</sup>

The participant had to select one answer out of four: (1) B will increase; (2) B will decrease; (3) B will not be affected; and (4) "don't know". We avoided a forced-choice paradigm since encouraging guessing amongst the truly ignorant biases estimates of knowledge for the sample as a whole and reduce the reliability of summated scales, while Sturgis, Allum, and Smith (2008) showed that responses given to requests for a "best guess" after an initial "don't know" to questions of factual knowledge fare no better than the expectation under a "blind-guessing" strategy. This format was used for all the possible combinations of variables in both directions, 342 questions in all. The order of the questions was determined at random for each subject.

Following this part, we asked 19 self-report questions on their understanding of the variables involved. These questions formed part of the computer-administered session. The phrasing was: *To what extent do you understand the meaning of the following concepts?* Participants had to type a number (1–5), with the Likert scale materialised as a line with five marked segments. The endpoints were labeled as: "1—I do not understand it at all" and "5—I understand it very well."

## Good/Bad Evaluation

Part of our argument will involve judgments of whether the rise in certain economic variables is good or bad by the public. To this end, we collected

<sup>1</sup> The actual questionnaire was in Hebrew.

data from a third group. We recruited new participants by means of the internet. From those who responded to the survey, 85 reported they had had no formal economic training, even at high school, and these formed our sample (mean age 26.1 years, 46 males and 29 females). The questionnaire was web-administered. Following demographic data collection, we asked: *Please mark for each of the following quantities whether an increase is a positive or a negative development.* They recorded their answers by clicking on a 5-point Likert scale, with the endpoints labeled Very good/Very bad, and the midpoint labeled Neutral. This provided us with data on the economic quantities considered to be good and bad by people without economic training.

## RESULTS

We begin by examining to what extent the two groups of participants (economically naïve and trained) reported that they understand the meaning of the economic variables involved in the experiment. Table 1 gives the mean

TABLE 1  
Mean Self-Report of Understanding the Meaning of the Economic Variables  
(1 = not at all—5 = very well)

<i>Variable</i>	<i>Economically naïve</i>		<i>Economists</i>	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Unemployment rate	4.67	0.48	4.39	0.78
Average net salary	4.33	0.98	4.22	1.06
Preference for local products	4.19	1.06	4.00	1.08
Government welfare expenditure	4.14	0.81	4.17	1.29
Corporate profit (“Profitability of businesses”)	4.14	0.81	4.06	1.21
Consumer debt	3.83	1.19	4.11	0.68
Economy growth rate	3.79	0.87	4.28	0.75
Degree of market concentration (“Competitiveness in the market”)	3.71	1.15	4.06	1.30
Investment by the public in stock market	3.57	1.19	3.72	1.27
Income tax rate	3.52	1.19	3.78	1.26
Consumption rate	3.48	1.09	4.39	0.85
State expenditure	3.43	1.21	4.50	0.62
Depth of recession	3.40	1.19	4.06	1.06
Money supply (“Quantity of money in the economy”)	3.31	1.14	3.89	1.18
Gross National Product	3.26	1.21	4.39	0.78
Rate of inflation	3.12	1.17	4.22	0.81
Interest rate on loans	2.48	0.89	4.28	0.89
Personal savings rate	2.40	1.04	4.17	0.71
National credit rating	2.33	0.98	3.61	1.38

TABLE 2  
Answering Directional Patterns

<i>Answer type on couple</i>	<i>Proportion</i>
Both increase	0.15
Both decrease	0.12
One increase one decrease	0.09
One direction only	0.34
Neither	0.29

values on the 1–5 scale, and is sorted by decreasing understanding for the naïve participants. As expected, the mean degree of self-reported understanding of economic variables is lower for the economically naïve: (mean Economically Naïve: 3.53; mean Economists: 4.11;  $t(18) = -4.01$ ;  $p = .0008$ ). Since the question was asked at the end of the questionnaire, we feared a bias due to the awkwardness of admitting they knew little about some of the concepts they had been answering questions about. We took therefore a new and comparable group of subjects ( $N = 36$ ) of first-year students in psychology and asked them simply to report, by means of a short pen and pencil questionnaire, how well they understood each of the concepts involved. The mean reported degree of understanding indeed dropped further, from 3.53 to 2.69 ( $t(18) = -3.83$ ;  $p = .001$ ).

We may learn about how comfortable participants felt answering questions on causal connections between variables from the prevalence of substantive answers. To recall, participants could indicate for every pair of variables whether an increase in the first increases or decreases the other, or indicate that the two are not causally connected, or they could give a “don’t know” (DK) answer. The average rate of DK answers was 27 per cent. In other words, in 83 per cent of the cases, the participants felt confident enough to answer.

The distribution of their answers is interesting. For any pairs of variables, A and B, several possibilities exist, when one considers both the link from A to B and that from B to A. The participants can state that an increase in either will increase the other, or that an increase in either will decrease the other; they may state that A affects B one way (increase or decrease), but B affects A the other way; they may claim that one of the variables affects the other, but that there is no effect in the opposite direction; or that the two concepts do not affect one another. These various possibilities are presented in Table 2. As may be seen, for any two variables, a causal link was claimed in more than two-thirds of the cases. Further, when both links (*A affects B* and *B affects A*) were affirmed, they went the same way (both increases or both decreases) three times more often than the opposite way.

To obtain a synoptic view of the way variables are causally related according to the participants, we used the number and direction of causal links between two variables as a measure of their “proximity” in the sense of multi-dimensional scaling. Whenever a participant affirmed that *A increases B* or that *B increases A*, we added 1 unit to the proximity relation between A and B. If the participant affirmed both, we added 2 units. Similarly, whenever a participant affirmed that *an increase in A decreases B* or conversely, we subtracted 1 unit from the overall proximity. Doing this for all pairs yielded a symmetrical matrix of the overall proximity of any two variables across participants. We subjected this matrix to a two-dimensional scaling procedure, using the MDS module in Statistica by StatSoft Ltd (Purkhardt & Stockdale, 1993). This procedure attempts to minimise the differences between the reproduced distances and a monotonic transformation of the input data, that is, the program attempts to reproduce the rank ordering of the input proximities or similarities (Borg & Lingoes, 1987). Figure 2 displays the resulting map.

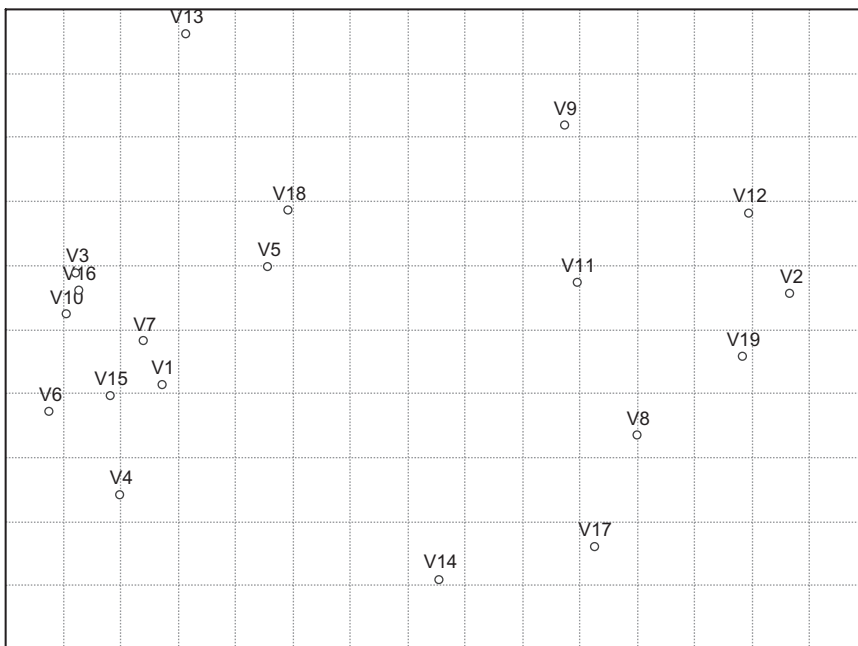


FIGURE 2. Economically naïve participants: Multi-dimensional scaling of the “proximity” of economic quantities (Alienation = .32). Two quantities A and B are closer when a rise/drop in one changes the other in the same direction; they are distant if a rise/drop in one affects the other in the opposite direction.



TABLE 3  
Members of the Two Clusters

<i>Positive pole</i>	<i>Negative pole</i>
GNP	Government expenditure
National credit rating	Rate of inflation
Corporate profits	Income tax rate
Investment by the public in stock market	Interest rate on loans
Average net salary	Unemployment rate
Consumption rate	Consumer debt
Money supply	Depth of recession
Rate of economic growth	Government welfare expenditure
Competitiveness of the market	
Preference for local products	
Personal savings rate	

The concepts are clearly clustered in two groups, separated by a large divide. K-means clustering analysis yielded the clusters listed in Table 3. A glance at these two clusters suggests an obvious interpretation: participants organise the variables in two poles, one good and the other bad. To bolster this interpretation, we obtained goodness/badness judgments on changes in the values of variables from an additional group of 85 participants without economic training (see the Method section above). We re-ran the multi-dimensional scaling analysis described above, but this time stipulated a one-dimensional outcome, which forces all the variables to line up. The correlation between the outcome of the one-dimensional MDS and the good-bad dimension is  $r = .93$  ( $p < .0001$ ).

These findings strongly suggest an explanation to the otherwise surprising willingness of untrained participants to answer the majority of the questions on concepts that, by their own account, they do not understand properly. When asked: “Does *A* influence *B* (and in what direction)?” participants can answer readily on the basis of a simple heuristic, which we dubbed the good-begets-good (GBG) heuristic: If *A* and *B* belong to the same pole, an increase in one will also raise the other; if they belong to opposite poles, a rise in one will cause the other to drop. This interpretation is reinforced by the correlation between how markedly positive or negative the concept is felt to be (as measured by the one-dimensional MDS) and the willingness to commit to an answer (proportion of answers 1–3). That correlation is  $r = .44$  ( $p = .028$  one-tailed).

Do economically untrained respondents resemble economists more when the concepts involved are clearly good or bad? First, we devised a measure of fit. Recall the four answering options for every question in our questionnaire: *If variable A increases, then variable B will \_\_\_: (1) increase, (2) decrease, (3)*

*no effect, and (4) DK.* Leaving aside for the moment the DK answer, we tabulated the distribution among the three substantive answers on every question separately for each group (economically naïve and trained). We then tested for each question whether the distribution differed between the groups at the  $\alpha = .05$  level, by running a chi-square test. This procedure settled, for each question, whether the two groups produced the same pattern of answers to that question. Overall, for 62 per cent of the questions, no significant difference was found between the groups, but we are mainly concerned with the identification of the questions where the two groups converged on the same answers.

We next determined for which questions the GBG heuristic is relevant. Since answers on the good/bad dimension were given on a bi-polar scale (Bad/ Neutral/Good), we classified each variable according to the nearest of these three points; that is, if the mean answer of the naïve participant, for a given variable, was closer to *Good* than to *Neutral*, it was counted as *Good*, as *Neutral* otherwise, and conversely for the *Bad* end of the scale. This clustered all the concepts into three groups, *Good*, *Neutral*, and *Bad*, which in turn yielded nine combinations for the pairs of variables. The applicability of the GBG heuristic is simple: pairs with at least one *Neutral* concept do not allow the heuristic, and all the others combinations do. When it is relevant, the proportion of fit between economically untrained and economists was .71. When it is not, that proportion dropped to .31.

This result suggests that economists reflect the good/bad dimension in their thinking. We produced an MDS plot (see Figure 3) by the same procedure as used for the economically untrained. As may be seen, their maps are indeed quite similar.

## How Accurate is the Feeling of Understanding of the Naïve Participants?

First, we tested whether the “don’t know” (DK) response is resorted to more often when one of the concepts involved is less familiar. As expected, participants are more likely to take a stand on the relation of a concept to others when they believe they understand it better (correlation between self-reported understanding and use of DK:  $r = -.72$ ;  $p < .0001$ ). The correlation for economists goes in the same direction, though as there is a ceiling effect, there is little variance and the correlation is not significant ( $r = -.34$ ,  $p = .15$ ).

This merely shows that the economically untrained participants are self-consistent. A more important question is: How valid is their self-estimate of understanding? When they feel they understand the concepts involved, do their judgments converge with those of trained economists?

We described above how we determined for every question whether the two groups produced a significantly different pattern of answers or not.

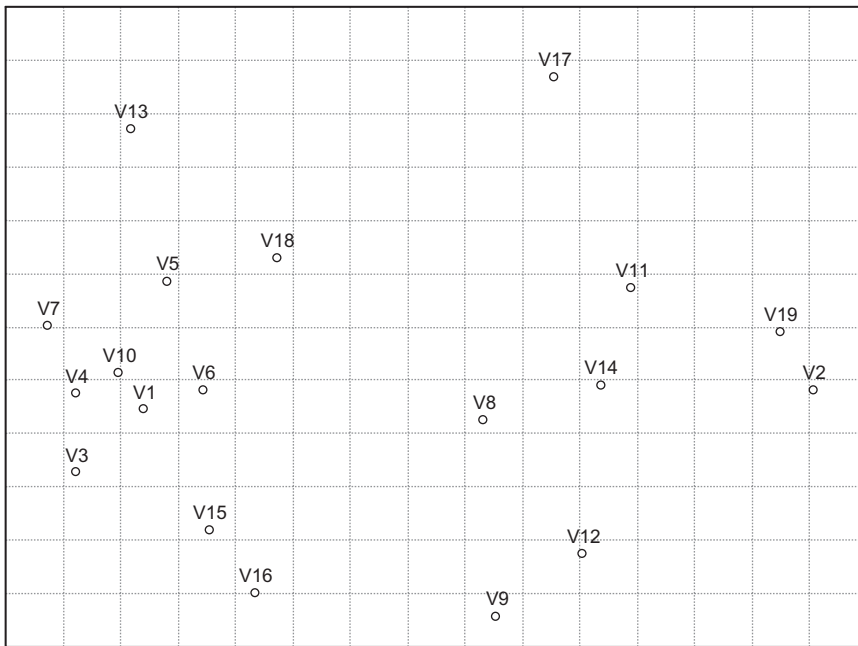


FIGURE 3. MDS economists: Multi-dimensional scaling of the “proximity” of economic quantities (Alienation = .197). Two quantities A and B are closer when a rise/drop in one changes the other in the same direction; they are distant if a rise/drop in one affects the other in the opposite direction.

When the difference was not significant, we considered the two groups were matched in their answers. This enabled us to run a probit regression analysis, with the self-reported extent of understanding of the cause (A) and the effect (B) variables involved as predictors, and as predicted variable the match (1) or mismatch (0) between the groups. Both predictors proved highly significant, with the effect of the cause variable much larger than that of the effect (Wald coefficient *cause*: 34.36,  $p < .0000001$ ; Wald coefficient *effect*: 14.57,  $p < .0001$ ), an asymmetry that may be related to Sevón’s (1984) observation of an easier flow from cause to effect than conversely. We also tested whether the potency along the good/bad dimension (very good or bad vs. neutral) improved the prediction. Since the good/bad (GB) dimension was measured on a 5-point scale, we computed the new predictor variable accordingly as  $|GB-3|$ , that is, the distance between the value indicated by the subject and the midpoint on the good/bad scale. Following this logic, values of 1 and 5 on the Likert scale were recoded as 2, values of 2 and 4 as 1, and 3 as 0. This new variable, which captures the potency of the evaluation rather than its

direction, did not approach significance. Potency did not contribute to a prediction of the match between economically untrained and trained participants, beyond self-reported understanding.

## CONCLUSIONS

We set out to understand how economically naïve people handle economic causal discourse to which they are constantly exposed. Their answers are at first sight paradoxical: on the one hand, they declare on average not to understand the concepts very well. On the other, they are quite willing to judge how changes in one economic variable would affect another. Our interpretation is that what enables the economically untrained to answer is their superficial approach to the issues. The domain of economic variables is for them bipolar, a tendency identified by Brown (1991) as a universal tendency of human nature. Economic events are classified as good or bad, not as neutral components in a causal system: “Social actors do not try to isolate an economic object from social reality; on the contrary, they relate social and economic elements in their representation” (Vergès, 1989).

We submit that naïve participants rely on a simple but powerful heuristic: the economic world functions in either a virtuous or a vicious circle. An increase in one good variable will increase the values of other good variables, and decrease those of bad variables. This *good-begets-good* heuristic settles in most cases how to answer. It is not unrelated to the way economic events are commonly described in popular economic discourse, with strong valuation of every change as either positive or negative. Here is a sample at random:

The day’s news is mostly *positive*. The *better than expected* housing starts numbers come a day after the National Association of Homebuilders Sentiment Index [HMI] rose more than expected. It seems now that the *worries* about a housing debacle in 2007 might have been exaggerated. As a result, stocks are likely to respond *favorably* to today’s numbers because a period of *improving* economic growth and low inflation is *ideal* for corporate earnings. (<http://www.insidefutures.com/article/3641/MORNING%20WATCH,%20Jan.%2018.html>, accessed 1 August 2007)

Professional economists too commonly look at the economy as being in a good or bad state. Indeed, they have long devised economic indices to suggest an overall evaluation of the state of the economy. The first “misery index”, introduced by Okun in the Lyndon Johnson years, is simply the unemployment rate added to the inflation rate. Later, Robert J. Barro (1999) refined the misery index by adding gross domestic product and interest rates to inflation and unemployment. More recently, Merrill Lynch’s economists devised a yet broader index (see *The Economist*, 12 January 2006): it adds

unemployment and inflation rates, interest rates and the budget and current-account balances, but then subtracts GDP growth. Its rationale is that high unemployment, inflation, and interest rates are bad, whereas positive budget and current account balances and a high GDP growth rate are good. Parallel arguments on the use of “cognitive shortcuts” have been advanced as the basis of political decisions by much of the public (e.g. McClurg, 2006; Mintz, 2003).

While the economically naïve participants in our study use a heuristic, they remain cautious. They do not understand all concepts equally well, and avoid committing themselves when the meaning of the economic variables becomes more obscure to them. They are right in their self-evaluation: the better they feel they understand a concept, the more often their judgment matches that of the trained economists.

The good-begets-good heuristic does not imply the ability to *explain* causal links. The depth of explanation of economic concepts is low in all segments of the population (Leiser & Drori, 2005), and indeed, a lack of explanatory depth is a general feature of human understanding (Keil, 2003; Keil, 2006; Leiser, 2001; Rozenblit & Keil, 2002).

We set out to describe how the public handles economic theory elements that are thrust in its face, given that the theory is vastly more complex than it can handle. The answer is: the combination of a useful heuristic, reasonable self-evaluation and shallow understanding.

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