

CHILDREN'S CONCEPTIONS OF ECONOMICS – THE CONSTITUTION OF A COGNITIVE DOMAIN

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The understanding of economics of 89 Israeli children, aged 7–17, was probed by means of interviews and questionnaires. Questions asked covered a broad range, including: commerce, production, strikes, capital investment, and the causes of inflation. The answers are analyzed in a cognitive framework. It is argued that economic understanding is initially based on “conceptions”, small but growing interpretative vignettes which provide a meaningful account of economic actions. Macro-economic phenomena which lie outside the explanatory scope of single conceptions are understood later than the behavior of individual actors.

What do children understand about economics, and how does this knowledge develop? Generally speaking, the development of complex cognitive structures is composed of two processes: the development of *substructures* which are understandable in isolation – possibly at the cost of some distortion; and the integration of these substructures in an overall organization. The lack of cohesiveness expected of any cognitive domain in formation is compounded, in the case of economics, by the variety of sources on which subjects draw, and the diversity of the kinds of knowledge involved: (a) concepts such as those studied in “social cognition” research, like fairness, friendship, equality, blackmail, etc. (Berti and Bombi 1981; Chandler 1977; Damon 1977; Furby 1979; Moessinger 1974; Shantz 1975; Siegal 1981), are mainly acquired

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through social interaction (Turiel 1978; Damon 1981); (b) specific facts, personally observed or experienced, such as the consuming and earning behavior of the subject and his or her family; (c) the vast quantity of information concerning the national economic life, regularly received from the mass media and largely formulated in a specialized vocabulary. Because of the diversity of sources of information, and the variety in the kinds of knowledge involved, it is to be expected that understanding of economics will initially be fragmentary, even inconsistent.

Information on some aspects of the development of understanding economics in children is available from a number of studies: Danziger (1958), Sutton (1962), Gentner (1975), Furby (1979), Furth (1980), and Jahoda (1979). The subjects in these studies were of grade school age or younger and their development was generally interpreted from a structural, Piagetian perspective. The picture that emerges from them is, as might be expected, one of gradual progress both in the extent of the knowledge and in its organization (see Stacey 1982, for a recent review). Monetary transactions, having been the most studied topic, may be used to illustrate that development. Very young children may be capable of engaging in elementary transactions (e.g., buying milk at the grocer's, giving the shopkeeper some money and receiving the change (cf. Gentner 1975)), but up to about age 5–6, they do so without any understanding. To them, the money exchange is a meaningless ritual (Furth 1978, 1980). The type of knowledge at that stage might be represented by a "script" or "scenario" (Nelson 1981). These are cognitive structures which define the role of a participant in an extended interaction, and specify the actions that are to take place successively (Schank and Abelson 1977; Ross 1981; Holyoak and Gordon 1982). Children may even be able to enact several of the roles indicated by the script, without understanding the function of any of these interlocking actions.

In a second stage, they grasp the function of money as an instrument of exchange, but still know nothing of its further destinations or uses (ages 7–8). In more general terms, this stage is characterized by the understanding of "first-order societal relations" (Furth 1980), and the lack of understanding of the system constituted by them. The third stage, which in the case of monetary transactions is reached around 9–10 years, is marked by the emergence of part-systems. These are uncoordinated with one another, and frequently give rise to cognitive

conflicts. Around age 11, these conflicts begin to be overcome and from then on, the extent of progress depends on the interests and capacities of the subjects.

As an example of the cognitive conflicts just alluded to, consider Jahoda's (1979) study of the progressive coordination of two economic subsystems in which shopkeepers are involved: the trading activity (buying from suppliers and retailing to individual customers) and the wage system, whereby shopkeepers earn their living. He found three stages in the answers of his subjects: (1) Lack of awareness of any system: shopkeepers need not pay for goods delivered to their shop (6–8 yrs). (2) Two independent subsystems: shopkeepers ask from their customers exactly what they are charged by their suppliers – asking more would be dishonest. Their salaries come from some outside source, often the local government. (3) Integration of the two subsystems: the customer pays more than the shopkeeper for the goods received, and the latter's earnings come from the difference (beginning around age 11).

While the models we summarized include advanced stages based on the understanding of economic *systems* (Danziger 1958; Furth 1980; Stacey 1982), the actual empirical basis is, in the main, limited to the lower range: subjects have almost always been grade-school children, and the topics of the interviews, questionnaires, play acting, etc. were restricted to individual transactions. Economic systems, however, are constituted by the aggregate effect of many actors. Each behaves independently, driven by his or her own motives, but contributes to transpersonal economic forces. In the present study, we endeavoured to broaden that empirical basis. The topics we asked about ranged from elementary roles (customer, employer, etc.) to global economic phenomena (e.g., inflation, price determination, or evaluating the consequences of a massive distribution of money to the people by the government). In view of what is known about economic understanding in children, we expected that grade-school children would not span the developmental spectrum on the more difficult topics, and therefore interviewed subjects in the 8–15 years range.

Method

The study was conducted in two parts. In a preliminary study, 45 subjects were interviewed in an unstructured way, in order to gain some

familiarity with their knowledge of the economic world, and to probe their conceptions freely. The age of the children ranged from seven to seventeen and they came from a number of backgrounds.

The main study was conducted in a more controlled fashion. A questionnaire was constructed to cover the range of topics of interest: prices, salaries, strikes, investments, inflation and money printing (see the Appendix). The questions were asked in a personal interview, following a fixed order, but at certain points the children were encouraged to develop their answers and to try to think of alternative ones. This questionnaire was administered to 44 children, living in one of the poorer sections of Beer Sheva, Israel. Their ages were as follows: group S: 8–9 yrs (15 subjects); group M: 11–12 yrs (17 subjects); and group L: 14–15 yrs (12 subjects). All interviewing sessions were tape-recorded and transcribed afterwards.

The interpretation of the data proved difficult for reasons directly concerned with the purpose of this study, namely, the marked instability of the answers. This manifested itself in two ways. First, additional probing of the simplest kind (e.g., "How are prices determined?" followed by "How else?") often yielded significantly different responses. This extra probing was standardized and all answers pooled, but the fact remains that the children do not spontaneously say all they know. Caution should be exercised therefore in interpreting the answers: the absence of a point in the answer does not necessarily prove that the children do not know it at all. It may merely indicate that it was not foremost in their mind when they generated their answer. Further, different questions related to the same point frequently elicited different, sometimes contradictory answers. We took care to approach the main points from several directions, but only to discover that the several answers often would not match. Whereas we intended to present the frequencies of *beliefs* about certain topics, we were compelled to tabulate the *answers* to specific questions instead. The interpretation of such tables remains somewhat problematic. In addition, the number of subjects in each group is small. Having first interviewed many subjects freely gives us a measure of confidence in our interpretations. Nevertheless, the present study should be considered as exploratory, and its conclusions as tentative only.

Results and discussions

Prices

The lack of integration of knowledge concerning the economy is strikingly apparent in the subjects' answers relative to the way prices are determined. The following, for example, are all taken from a single protocol of a nine year old boy. It is obvious that this subject has many notions about the causes of price changes, and equally obvious that these notions are not coordinated with one another:

(a) Can the grocer ask as much as he wants? *No, he cannot. He is forbidden to ask as much as he wants. (...)*; (b) *He always increases. I always notice that when one (grocer) increases, then they all do*; (c) *Do prices generally go up or down in this country? Sometimes up and sometimes down. Why up or why down? Down, I don't know, but up I know. Why? Let's say he buys eggs and he buys them at, say, 27 pounds. Then when he brings them to the shop he sells them for 30 pounds*; (d) *Let's say they announce on the radio that shoe prices will drop, ok? (...)* (what will) the Minister of the Treasury (think about it)? *He'll be mad, because he raises prices. He'll be mad, if prices go down? Yes, but now we have a new minister, and I think he'll be allright.*

According to this boy: (a) prices are fixed; yet (b) the various shops seem free to raise their prices; (c) price increases are caused by the difference between the buying and selling prices (!), and the latter seems to be freely chosen; nevertheless (d) it is the government which is responsible for deliberate price increases.

Our questions did not touch upon all the economic mechanisms which influence prices. Before presenting our results, we therefore describe the simplified set of relations that we will be concerned with:

- there are two kinds of goods, those whose prices are controlled by the government, and others;
- the latter's selling price is composed of the amount paid by shopkeepers to their supplier, which is a function of the production costs, and of their own benefit, which they try to maximize;
- customers will buy if (i) they are willing to pay the price asked for the goods in question, and (ii) they cannot get them cheaper elsewhere.

Table 1
Monetary transactions: price and profits.

(a) Free prices (question 3).

	<i>N</i>	Yes	No	Depends
S	15	0.40	0.60	0
M	17	0.18	0.70	0.12
L	10	0.10	0.20	0.70

(b) Uses of money (question 4).

	<i>N</i>	Private	Shop	Both	Don't know
S	13	0.53	0.15	0.15	0.15
M	17	0.70	0.06	0.23	0
L	12	0.17	0.08	0.67	0.08

(c) Determination of prices (questions 2 and 9).

	<i>N</i>	Shopkeeper	Government	Production costs (+ profits)	Value/Buying price	Don't know
<i>Question 2</i>						
S	14	0.29	0.21	0	0.14	0.36
M	17	0.24	0.29	0.06	0.17	0.23
L	12	0.25	0.42	0.08	0.25	0
<i>Question 9</i>						
S	12	0.08	0.25	0.08	0.16	0.42
M	16	0	0.50	0.13	0.25	0.13
L	10	0	0.30	0.70	0	0

Let us now see how our subjects answered the relevant questions. Can the shopkeeper ask as much as he or she wants? (Question 3.) The lower two age groups tend to think that they are not free: *No, the government decides. It is forbidden to ask more.* (9 yr. – see table 1a.) [1]. The older subjects generally (70%) recognize that there are two kinds of goods: *There are goods which are subsidized – these the government decides. There are some without, these he (the shopkeeper) decides.* (14 yr.) What does the shopkeeper do with the money received? (Question 4.) As is apparent from table 1b, the lower two age groups thought of

[1] All tables have significant chi-square ($p < 0.05$ at least).

the money paid by the customers primarily as the shopkeepers' possession, to be used for their own expenses: *He buys things, food for his children.* (11 yr.) Among the older subjects, the expenses of running the shop and buying new stock are generally mentioned, in addition to the private expenses: *Buys for his family.* What else? *He buys new products for his shop.* (14 yr.) *He buys for his shop.* What else? *Lives from it.* (15 yr.)

Our subjects were twice asked the purposely general, open-ended question: How are prices determined, once after the introductory questions regarding their own buying habits (Question 2), and again after answering general questions regarding inflation, price increases, and their causes (Question 9). The answers are tabulated in table 1c ("Production Costs" means that the subject indicated that the selling price is determined by the production costs. We also included under this heading the mostly older subjects who added that the shopkeepers' profit comes on top of this cost. "Value/Buying Price" refers to the answer: *The shopkeeper asks as much as it costs.* In Hebrew, the phrase has an ambiguous meaning: "How much it is worth", and "How much it cost the shopkeeper".)

One difference between the two panels in table 1c is in the role attributed to the shopkeeper in determining the prices: about one quarter for Question 2, virtually zero for Question 9. The second difference concerns the proportions of subjects who referred to the production costs. In answering Question 9, 70% of the older subjects referred to these costs, and most of them to profits as well, whereas only 8% referred to them when answering Question 2.

These findings can be interpreted with reference to two perspectives on the set of economic relations described earlier. We suggest that they alternate in the subjects' consciousness, and that one or the other is involved or manifested in any given answer. We will call them the shopkeeper's perspective and the fair-exchange conception:

When taking the *shopkeeper's perspective*, a given item's price is what the shopkeeper asks – in keeping with what is overtly happening in the shop. The subjects do not spontaneously wonder why he or she doesn't ask more, but when asked, offered three reasons: people would go elsewhere (one half of the youngest children were already aware of this); the shopkeepers' good heart makes them take people's difficult economic circumstances into consideration; the government checks excessive prices.

The *fair-exchange conception* views buying as the exchange of goods for an amount of money equal to its value. "Value", in this context is either: an unanalyzed concept; believed to be standardized by the government, which serves as the source of legitimacy; or determined by production costs. It should be noted that under this reading of the logic of purchase, there is no room left for the shopkeepers' profits.

A mature conception can be reached when the subject learns that benefit on a sale is compatible with giving the customer fair value. Before then, one or another of these conceptions dictates answers to the questions. In particular, the shopkeeper's perspective is dominant in Question 2, in the context of concrete discussion of buying in the shop, whereas more general questions about price increases in the country in general activate the second, more abstract conception in Question 9.

Table 2
Work relations and salaries.

(a) Who pays the salaries? (Question 17.)

	<i>N</i>	Banks	Government	Boss	Depends (Boss and Government)
S	15	0.26	0.47	0.27	0
M	17	0.17	0.41	0.18	0.23
L	12	0	0.17	0.17	0.67

(b) Strike organizers^a. (Question 24.)

	<i>N</i>	Government	Workers	Don't know
S	15	0.40	0.32	0.27
M	16	0.25	0.75	0
L	9	0.11	0.88	0

(c) Raise giving. (Question 25a.)

	<i>N</i>	Government	Boss	Depends	Bank
S	14	0.71	0.14	0	0.14
M	12	0.76	0.08	0.08	0.08
L	10	0.40	0.40	0.20	0

^a Subjects who answered Minister and Government were classified as Government; those who answered Minister and Workers, as workers. The four subjects who answered Minister only were dropped from this table.

Work relations

The relationship between employer and employee, and the concept of salary, can similarly be regarded from two perspectives: that of the worker, and that of his or her employer (cf. Danziger 1958).

In the *worker-centered conception*, salaries are the income of individuals, from which they and their families live. In order to be entitled to one, a person must have a job. In this conception, the money for the salary may come from one out of several agencies: the bank; the governmental Providence (or the providential government, see below); the manager, acting as the government's agent; the boss, who is (inexhaustibly) rich. A common feature of all these views is that the work performed bears no relation to the source of money.

The other conception is *centered on the employer*, who may be involved, e.g., in production. People produce goods in order to sell them, and make a profit thereby. Machines may be bought to increase output and workers may be hired for the same reason, but also to allow the boss to work less. In this conception, salaries are paid by the boss, to induce others to work for him/her in order to increase his/her profits.

Questions relative to work relations were asked in the context of salaries: Who pays them, who pays increases and the meaning of strikes. The issue arose again later, but from another angle, in questions about the motivations of entrepreneurs who open up new factories.

Looking now at the quantified data, we note the following:

- When questioned about salaries (table 2), and on where the money for it comes from, a quarter of the young children mentioned banks, one half the government, and only one quarter the boss. Older children did not refer to banks, but they mentioned the boss more readily, and mainly indicated that some salaries are paid by the government and others by the boss. It usually is the government which is believed to pay the increase in salary after a strike, but this tendency diminishes with age.
- When discussing factories, on the other hand, subjects mostly see them as privately owned, with profit as the driving force (43, 31, 75% for the three age groups S, M and L), and money as the main or even the sole prerequisite (22, 44, 58%).

Here, the two conceptions are not incompatible, as it is possible, indeed normal for employers to make a profit, and their workers to earn their living by working for them. There is of course an objective conflict of interests about the extent that the workers are exploited but the amount of the salary is not related to this conflict according to the children. At any rate, before they may become aware of the conflict of interests, they must dissociate the two perspectives. This is reflected in the very clear age-trend regarding the distinction made between the public and the private sectors.

Banking and investment

We have seen that children possess a notion of capital investment. People erect a factory in order to make money, but they have to *spend* large amounts of money first. It is noteworthy therefore that many of them denied explicitly that there is a way to increase a sum of money in one's possession, despite this implicit understanding of capital investment, and despite some vague awareness that such dealings occur in banks (table 3). The reason for their position was brought out clearly by our follow-up question: Why would the bank pay more than what it had received? (Question 28.) The subjects could not think of any reason and this is why they rejected the possibility. Interest paid on savings accounts was explained away as a form of indexation to the cost of living index, which preserves but does not increase purchasing power. Needless to say, the explanations were not put in these terms, but the notion of indexation underlied their solutions. These answers parallel those by Jahoda's subjects who equated selling and buying prices in the

Table 3
Investment. (Questions 27 and 28.)

	<i>N</i>	Consume	Bank (+ consume)	Shares/interest	Indexed	Don't know
S	14	0.86	0.14	0	1	1
M	16	0.50	0.50	1	2	5
L	12	0.25	0.75	4	4	1

Note: Figures on the right are frequencies, and constitute the breakdown of the answers "Bank" given on the left. Subjects who answered both Consume and Bank were counted as Bank.

shop out of a misapplied notion of fair dealing. Here, inasmuch as banks are considered as a safe-deposit institution, the amount "in" must equal the amount "out", or at the most, the purchasing power "in" equals the purchasing "out", and no thought is given to the way this unsubstantial entity might be stored in the banks' vaults (cf. Jahoda and Woerdenbagch 1982).

In cases such as these, it is clear that children's understanding is not merely composed of those pieces of knowledge which they may have chanced to pick up. On the contrary, they organize this knowledge, using such conceptual tools as they may possess. One of these is an apparently unexceptionable belief in conservation in storage. This belief is misleading, when applied to banks, because of their profitable economic activities of which the child is entirely unaware.

The pattern of results we saw regarding prices and salaries obtains here as well. There are two conflicting conceptions of investment, defined as increasing a sum of money in one's possession. It is possible, when the child thinks of factories or other productive endeavours, and impossible when he or she considers banks and conservation.

Inflation

The rate of inflation in Israel is exceedingly high (about 130%), and the term inflation has become a household word. While practically all the subjects were familiar with the word, it is only around age twelve that any relevant associations are collected: high prices, and excess money in the hands of the public (table 4).

From the specific answers collected and even more so from the 45 subjects who were interviewed without a confining questionnaire, it was evident that none of the subjects had a notion of inflation as a unitary

Table 4
Inflation. (Question 5.)

	<i>N</i>	Too much money in the public	High prices	Don't know
8-11 yrs.	23	0	0.17	0.83
12-15 yrs.	20	0.25	0.50	0.25

process. To prove this would require citing extensive sections of the transcripts. We can do no more here than illustrate a few distortions we observed. Inflation was often seen not as a process at all but as a *state*: the unfortunate state of the economy, in which prices are very high. When inflation appeared in an explanatory account, it was plainly vacuous. The following exchange is an extreme but common case: Why are prices high? *Because of inflation*. What is inflation? *The prices are high*. (12 yr.) To be sure, some of the component links in the process were appreciated, such as that if prices keep increasing, people will have to be given higher salaries, apparently for moral reasons: *Otherwise everybody will die*. (11 yr.) But even then, the links were sometimes strangely interpreted. For example, "too much money in the public" could mean that too much money without supervision would lead people into trouble with the law, as an adolescent might. The solution would be, accordingly, to "supervise" the public, rather than to absorb the excess liquidity.

In summary, the concept is not attained even by the oldest of the subjects we questioned.

Roles of the government

Looking back at the several tables presented up to now, it is apparent that the government is attributed a privileged role in economic life. To regroup some of these findings: The government sets the prices (25, 50, 30% for the three age groups S, M, L). It pays all salaries (47, 41, 21%) or at least some of them (0, 23, 64%); sometimes, the employer pays the salary, but the money still comes from the government. When there has been a strike, it is the government which pays increased salaries (71, 77, 40%). The government is also thought to organize strikes, mostly by the younger subjects (40, 25, 11%), and occasionally, the same subject will say both that it organizes the strikes and that it eventually has to pay the increase.

What are the reasons for this tendency? To some extent, it no doubt is a consequence of the important role objectively played by the government in Israel. It subsidizes a number of essential goods and services, whose prices it controls and periodically raises. There is a large public sector and during the interviewing period, there was a strike by (public) school teachers. The child no doubt generalizes readily from

such publicized events as the teachers-government negotiations, official announcements of increases in prices of subsidized goods, and pre-electoral pledges by the Treasury to keep prices down.

To know whether this is the only reason requires a comparison with subjects in a country where the government does not intervene to the same extent. As a modest first step, our questionnaire was administered to twelve American children coming from an academic milieu. The answers given by this small sample suggest that in the US, too, children tend to overemphasize the role of the government. (A more detailed comparison is not warranted, in view of the different background of the subjects.) Another relevant study, involving some 300 subjects, supports this impression. Cummings and Taebel (1978) administered a long questionnaire relating to various aspects of the economic life. The purpose of their study was different from ours, relating as it did to the Marxist analysis of socialization, and no figures are available on the points of interest to us. However, the authors report that up to the ninth grade, a large proportion of their subjects saw governmental influence as "pervasive": setting the prices, "controlling money", owning the banks, etc. It seems safe to conclude that our subjects' overestimation of the influence of the government is not solely due to the actual importance of the government for the Israeli economic life, and more general cognitive factors must be invoked.

Predicting economic consequences

Two of our questions were designed to tap our subjects' ability to reason about economic matters. The first required them to imagine the reactions of several economic agents to a shoe price decrease "announced on the radio". Not surprisingly, all subjects at all ages expected "mother", the paradigmatic consumer, to be happy about the news, and often to react by going out to buy shoes. Regarding the shopkeepers' predicted reactions, an interesting development is seen. The youngest children mostly (60%) expected them to be unhappy about the drop in prices, since they would receive less money. Many of the subjects in the intermediate age group (43% vs. 25% among the youngest) noted another factor: since prices would be lower, *more* customers would come, so that the shopkeeper could actually benefit from the change. The oldest subjects usually (75%) included this factor

in their reasoning. However, since the advantages and disadvantages resulting from the price drop could not be quantified, most of them concluded with a non-committal "it depends" (64%): *It is both good for him and not good for him. Can you explain this? Good, because there'll be more buyers, and not good, because he'll earn less (from each buyer).* (15 yr.)

The last question in the interview related to the consequences of an extreme monetary policy: What would happen if the government were to print 'lots' of money and distribute it to the people? (Question 41.) Among the younger children, 60% judged that this method of generating wealth is in principle excellent: *Everybody would become rich.* (9 yr.) This percentage drops sharply with age (60, 31, 8%). It is interesting to see the type of answer the younger ones gave, when faced with the obvious follow-up question: Why then doesn't the government do so? By and large, they explained that this is due to practical difficulties: the special ink needed is unavailable, or the special paper is too expensive, or the printing press has a limited output, "*they print as much as they can*", or even because of the high wages paid to the printers (!). Older subjects tried to work out the untoward *economic* consequences of the policy, and used them to explain the government's abstention. Negative economic consequences were mentioned by 21, 31 and 89% of the subjects in the three age groups.

General discussion

Exploratory studies such as the present ones do not yield definitive knowledge. Their value lies in the fact that they afford an opportunity to articulate a general approach to large problems, thus laying the groundwork for a proper and orderly investigation. In this spirit, we propose an integrative framework for the analysis of the development of economic understanding in children. Based on the work of previous investigators and on the data we collected, it remains in need of further elaboration and validation.

Two modes of understanding are involved in answering questions about economics. The first is embodied in what we termed *conceptions*. These are small coherent systems of concepts and beliefs, which define the roles of the participants in an economic interaction from the perspective of one of them, and assign meaningful motives to their

actions. The second mode may be broadly called *reasoning*. It consists of a set of processes by which the subject judges propositions, compares and evaluates them, or derives their consequences.

The growth of economic understanding is marked by the different rate of development of these two modes. Initially, children view economic transactions from the perspective of individual participants, and have no awareness of a system of economic forces which results from and affects the individual transaction. For very young children (5–6 yrs.), this viewing is restricted to role playing in “meaningless rituals” (Furth 1980; Nelson 1981; Higgins 1981; Holyoak and Gordon 1982). These role scripts evolve into conceptions, which do make sense of the actions of the individual actors, albeit often in a distorted and one-sided way (Furth’s second stage). As children grow older, these part-systems become more definite and come into conflict with one another (ages 9–10). Around age 11, the children themselves become aware of the conflicts, attempt to eliminate them, and are often successful. Furth (1980) notes how frequently children who discover a contradiction in the course of the interview managed to overcome it there and then. It is the development of reasoning which makes this possible. Younger children have to rely exclusively on their conceptions to assimilate the economic world. Around age 11, their meta-cognitive awareness (Flavell 1979) and their propositional reasoning ability improve to the point that they notice inconsistencies in their judgments, and try to eliminate them. In addition, the newly developed reasoning powers enable the subjects to understand progressively those economic phenomena which cannot be apprehended in a conceptions-based system. This development, noticeable from age 11 on, may continue into adulthood, with the development of abstract theoretical models of economics.

We now return to our data to illustrate this general outline. Several instances of conceptions were presented in the Results sections a.o.: the fair-exchange conception of buying; the profit-making conception of selling; the hiring of labor by entrepreneurs; going to work to be entitled to a salary; and storing one’s money in the safety of a bank. Each of these describes a meaningful activity, which involves one or several roles. The type of understanding embodied in such conceptions is quite valid, and is incorporated in the models of economics entertained by more mature thinkers.

However, children’s conceptions suffer from a number of difficulties, due to their origins. In theoretical economics, too, models of limited

phenomena are constructed. But the phenomenon modelled has to be demonstrably independent to a large extent; otherwise, the model would be worthless (Granger 1967). In contrast, the phenomena corresponding to conceptions are delimited by the child on the basis of superficial acquaintance, not of economic analysis. As a result, several different conceptions may pertain to the same phenomenon. This produces inconsistent answers to essentially the same question, a phenomenon noted by most previous investigators (Danziger 1958; Sutton 1962; Furth 1980; Jahoda 1979), and illustrated here once more. The incoherences range from flat contradictions (i.e., the government sets all prices, and the shopkeeper is free to change them), to more subtle forms (the government organizes strikes, and the government also has to pay the salary increase; a drop in shoe prices will send mother buying shoes for the whole family, yet means, unequivocally and uncritically, a diminished income for the shopkeeper). The conception which underlies the answer actually produced is influenced by the specific question, and by the context in which it is asked. As long as the children do not try to confront their various answers, the incoherence passes unnoticed.

About age 11, children become more alert to these contradictions, and also more determined and able to overcome them. The specific age varies, of course, in accordance with the subtlety of the contradiction at hand. The eventual harmonization of conceptions is of various kinds. The simplest case consists of the delimitation of the range of validity of two conceptions: the government pays some salaries, others are paid by private employers, while still other people live off the profits they make on sales. The government decides on some prices, but not on all. In other cases, however, the "reciprocal assimilation", as Piaget (1953) calls it, involves a true conceptual combination which modifies the original conceptions. For example, the conception of "buying as an exchange of money for something of equivalent value" must be so combined with that of "selling goods as a way of earning a living", that the notion of profit on a fair transaction ceases to be self-contradictory. One way this may be realized is in a new conception which involves a richer conception of *value*, such that the convenience of buying goods at the local store is considered a form of added value which may fairly be charged for. Similarly, the notion of *exploitation* lies at the articulation of the conceptions of the entrepreneurs who sell goods or services and hire labor to help them, and that of the laborer who accepts a job in order to receive the wages he or she needs. These examples under-

score, if need be, that there may be more than one way of coordinating individual conceptions into a coherent model or ideology (Abelson 1975; Connell 1971).

Conceptions are not always sufficient, and some of our questions required the subjects to go beyond them. Consider their answers when asked how shopkeepers would feel about a drop in shoe prices. A complete answer would include consideration of two factors: the diminished profit on each pair sold, and the increased volume of sales. Whereas the former was recognized by all subjects, the percentages of those who mentioned the latter was, for the three age groups, 25, 43 and 75% respectively. The difference between the two is clear: whereas the diminished profit is a direct consequence of the lowered selling prices, the increased volume of sales is the cumulative effect of the decisions of many prospective customers to actually come and buy. This second factor was apparently too remote for the younger subjects.

Even more difficult was the requested evaluation of the results of a massive distribution of money. Here, the prediction of negative economic consequences was required: raising prices, shortage of goods, and people's unwillingness to work were all considered relevant answers. The percentages of subjects who referred to such consequences was of 21, 31 and 89%. Again, the difficulty was to predict the cumulative effect on prices and on the work market of very large amounts of money in the public, and this is outside the explanatory scope of any one conception.

In view of this, it is certainly no surprise that the concept of inflation was not understood by any of the subjects in our sample. Inflation is a complex phenomenon, generated by the economic behavior of many classes of actors. It can only be understood in an approach which sees the economy of the country as a system. This our subjects evidently lacked.

The prominent role attributed to the government may be interpreted as a consequence of this. The child finds it easier to refer unexplained phenomena to the deliberate actions of a clearly defined entity, such as the government, than to impersonal "market forces", which do not feature in any of their conceptions. In a sense, the government functions as a personification of the country's economic forces, in much the same way that Durkheim (1912) explained belief in supernatural beings as substituting for a proper understanding of social forces. This account would also tally with Piaget's (1960) analysis of animism and artificia-

lism in children, whose understanding of physical phenomena is insufficient.

Modern economic thinking began with the study of the *system* constituted by the individual decision and actions of people and institutions in different economic positions. Children are ill-equipped to think at this level, as long as their understanding consists of a collection of interpretative vignettes of economic transactions. They can appreciate the motives of individual actors, but not predict the aggregated effect of their actions. With the development of reasoning, young adolescents are no longer tied to individual conceptions, and become able to predict at least some economic consequences of macro-economic changes. This ability remains limited, among the subjects we interviewed. How much it will progress once they become active participants in the economic life (Schmölders 1973) is still an open question.

Appendix: Interviewing questionnaire

Demographic data: Name, age, sex, father's occupation, mother's occupation, address, school.

Introduction: Until age 11: Do you buy things yourself? What kind of things?; after age 12: The purpose of this questionnaire is to learn what you think about the economic situation in Israel.

Prices

1. Do you often go to the supermarket or the grocer's yourself?
2. How are the prices there determined?
3. Can the shopkeeper ask as much as he wants? (*if not:* Who decides?) (*if so:* Why doesn't he ask more?)
4. What does he do with the money he receives? What else?
5. Do you know what inflation is? (*if yes:* Please tell me more about it)
6. Is it good or bad? Why?
7. Would you say that prices in Israel tend to go up or down?
8. Why? Can you think of other reasons?
9. How are prices determined? (*if someone decides:* How does he know?) Suppose the radio announces that shoe prices will go down.
10. What will mother think about it?
11. How will the shopkeeper feel about it?
12. How will the "head of the factory" (sic) react?
13. ... and the government?
14. What will happen if prices keep going up and up? And what then?

Salaries

15. What are salaries?
16. Who receives them?
17. Who pays them? Does anyone else?
18. Where does the money come from? From where else?
19. Does everyone get the same amount?
20. How is that amount determined?
21. Who decides?
22. What can people do if they think they do not get enough? What else?

Strikes

23. What is a strike?
24. Who decides there will be one?
25. Why do people sometimes strike?
- 25a. (*if to get paid more: Who should pay more?*)
26. How does the strike help (to reach the stated goal)?

Savings and Investments

27. What can a person do if he has more money than he needs to spend? What else?
28. How can he increase that amount until he needs it? (*if the bank will give him more: Why does the bank do that?*)

Factories and Banks

29. What is a factory?
30. How did factories start?
31. Why were they started?
32. Is it possible to start a factory today?
33. Can anyone?
34. Why would someone do it?
35. How did banks start?
36. Who decided to start them?
37. Is it still possible today?

The Mint

38. Who prints the money?
39. Who decides how much to print?
40. How do they know?
41. What would happen if they would print lots of money and distributed it to the people? (*if needed: Why don't they?*)

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