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Chapter 2

ECONOMIC PSYCHOLOGY

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Economic psychology is concerned with understanding human experience and human behaviour in economic contexts. Textbooks of economic psychology usually provide an introduction to the theoretical and normative fundamentals of human behaviour and the anomalies of everyday decision making. Further topics are economic socialization and lay theories, consumer markets from the perspective of households and businesses, and labour markets. Additional areas on the national level are poverty and affluence, money and the psychology of inflation, taxation behaviour, housework, and the shadow economy.

The present review first gives an overview on the diverse research areas in economic psychology by reporting an analysis of articles published in the *Journal of Economic Psychology*, from its inception in 1981 to 2001. Since the field is influenced by two scientific disciplines, a short outline of the history of economic psychology is given to provide a background for understanding the sometimes conflicting perspectives of psychology and economics. The chapter then focuses on decision making behaviour and topics in economic psychology that featured prominently in the *Journal of Economic Psychology* during the last six years, from 1996 to 2001. In addition, the review considers the standard works in the field, and, where necessary for understanding, other publications.

RESEARCH AREAS AND PERSPECTIVES

In the period up to the end of 2001, over 650 articles (apart from book reviews, short commentaries, and the like) appeared in the *Journal of Economic Psychology*. From the beginning of 1996 alone, the number of articles

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totalled 224. In order to establish the topic areas covered, Schuldner (2001) analysed and categorized the content of the titles, keywords, and abstracts. Categorization of the publications proved difficult; an attempt to achieve this using the keywords given in the articles was abandoned as impossible because certain concepts were either heterogeneous or missing altogether. The keywords used in the PsycINFO database also proved unsatisfactory and often misleading. Instead, a step-by-step, inductive set of categories was constructed with the aid of five colleagues in the field. In addition, the topic areas of two textbooks (Kirchler, 1999; Lea, Tarpy, & Webley, 1987) were used in structuring the content categories. Once convergence had been achieved and the articles had been satisfactorily and unambiguously assigned, the category system could be accepted. Table 2.1 lists content categories and frequencies of publications.

Approximately two-thirds of the publications in the *Journal of Economic Psychology* relate to topics in economic psychology (65%). Market and consumer psychology feature strongly with 29%. A third topic area is environmental psychology (5%). In economic psychology, the focus is on research into decision making (19%), with studies of choice and decision making by individuals (11%), and in social interactions, frequently from the perspective of game theory (7%). Topics relating to financial behaviour included investment decisions, savings behaviour, debts and credits in private households (5%), and financial markets (4%). Considerable space was also devoted to taxation behaviour (7%), the labour market (7%), economic socialization and lay theories (5%). Although the *Journal of Economic Psychology* does treat political aspects of economics such as economic growth and welfare, tax policies, and reforms (5%), these topics are represented particularly prominently in the *Journal of Socio-Economics*, whose target group consists mainly of economists interested in behavioural science. In the last six years, to which the present review relates, interest in decision making and choice has markedly increased (from 15% in 1981 to 1995 up to 26% in the years from 1996 to 2001). Not surprisingly, work on money and on the transition from national European currencies to the euro increased (from 2% to 6%). Studies on inflation have decreased (from 4% to 0%), as have those on consumer behaviour (from 31% to 25%) and environmental psychology (from 7% to 3%).

The above analysis of topics covered in the *Journal of Economic Psychology* casts light on the content of research. In addition, an analysis of authors and publications cited permits an identification of the main perspectives from which those topics are being studied. Schuldner (2001) found over 12,000 quotations from the literature in the period 1991 to the beginning of 2001. These covered 8,031 different studies, books, and journals. Previous publications in the *Journal of Economic Psychology* (4.3%) were most often cited in these articles, followed by publications in the *Journal of Consumer Research* (3.9%), *Journal of Personality and Social Psychology* (2.3%), and *American*

Table 2.1 Publications in the *Journal of Economic Psychology* from 1981 to 2001.

Categories	Total	1981–85	1986–90	1991–95	1996–01
Economic psychology	*424*	*61*	*82*	*121*	*160*
Theory and history (e.g., theoretical frameworks, life and work of scientist)	20	5	2	7	6
Choice and decision theory	122	14	15	33	60
Decision theory (e.g., decision-making under risk, choice behaviour, preference formation)	74	10	10	20	34
Co-operation/game theory	48	4	5	13	26
Socialization (e.g., lay theories, economic socialization)	34	4	17	6	7
Firm (e.g., firm behaviour, entrepreneurship)	18	1	1	7	9
Labour market (e.g., labour supply, work experiences, income and wage, unemployment)	44	8	6	15	15
Marketplace (e.g., pricing, price competition)	11	1	1	4	5
Financial attitudes and behaviour	59	3	9	22	25
Household financial behaviour (e.g., saving, credit and loan, debts)	35				
Investment/stock market	24				
Money (e.g., money in general, euro)	20	1	2	4	13
Inflation	17	5	10	1	1
Tax (e.g., tax attitudes, evasion)	44	10	12	12	10
Government and policy (e.g., welfare, growth, and prosperity)	35	9	7	10	9
Consumer psychology	*188*	*32*	*47*	*52*	*57*
Consumer attitudes	37				
Consumer behaviour	86				
Consumer expectations	46				
Marketing and advertisement	19				
Environmental psychology and other issues	*39*	*24*	*2*	*6*	*7*
Total	*651*	*117*	*131*	*179*	*224*

Note: The frequencies given for the principal categories (economic psychology, consumer psychology, and environmental psychology) incorporate in each case the figures for the subsidiary categories.

Economic Review (2.0%). The main subject areas of these journals indicate that economic psychology is mainly pursued from the perspective of social psychology and economics, but that there is also much space given to consumer research. The most cited authors were Daniel Kahneman, Nobel Laureate in 2002, and Amos Tversky, as well as Richard Thaler. All three have become well known for their direction-setting contributions to decision-making research and publications in *Econometrica*, *Science*, *American Psychologist*, *Journal of Economic Behavior and Organization*, *Marketing Science*, etc. (see the obituary for Amos Tversky by van Raaij, 1998). Werner Güth's contributions in the *Journal of Economic Behavior and Organization* and the *Journal of Economic Psychology* were frequently quoted in articles on game theory. Studies on consumer psychology and on the symbolism of goods drew particularly on the work of Russel W. Belk and Helga Dittmar published in the *Journal of Consumer Research*, the *British Journal of Social Psychology*, and in monographs. George Katona's *Psychological Economics* from 1975 and the 1987 textbook *The Individual in the Economy* by Stephen E. G. Lea, Roger M. Tarpy, and Paul Webley are frequently quoted. The articles published in 1989 and 1990 in the *Journal of Economic Psychology* by Karl-Erik Wärneryd and Fred van Raaij also feature prominently.

THE HISTORY OF ECONOMIC PSYCHOLOGY

The economic sciences study decisions on the use of scarce resources for the purpose of satisfying a multiplicity of human needs. People normally find themselves unable to satisfy all their needs, and are forced to choose between alternatives; their choice of one option in turn involves the pain of renouncing the advantages of all the other options. In economics, decisions on the allocation of scarce resources are described on the premise of rationality and maximization of utility. Economics has constructed complex, formal, decision-making models to explain and predict economic behaviour, starting from only a small number of axioms on the logic of human behaviour. These models often do not consider psychology.

Classical economics, which traces its origins to Adam Smith's (1776) *Wealth of Nations*, found itself challenged toward the end of the 19th century. Thorstein Veblen (1899) opposed the basic assumptions of rationality regarding decision-making goals and utility maximization with his findings on conspicuous consumption, showing that some goods become particularly desirable when the price rises. He expressed the criticism that economics does not consider cultural factors and social change. Wesley C. Mitchell (1914, p. 1) introduced his work on human behaviour and economics with the observation, 'A slight but significant change seems to be taking place in the attitude of economic theorists toward psychology', and closed with the prediction, '... economics will assume a new character. It will cease to be a system of pecuniary logic, a mechanical study of static equilibria under non-existent conditions, and become a science of human behavior' (p. 47). Clark (1918, p. 4) wrote: 'The economist may attempt to ignore psychology, but it is a sheer impossibility for him to ignore human nature, for his science is a science of human behavior. Any conception of human nature that he may adopt is a matter of psychology, and any conception of human behavior that he may adopt involves psychological assumptions, whether these be explicit or not.'

Economics and psychology showed an interest in the other discipline early on. It has long been beyond dispute on both sides that psychology and economics, and likewise sociology and economics (Swedberg, 1991), have not only extensive common boundaries, but also an overlap in the questions they pose. The main argument was that neither money, inflation rate, nor unemployment figures by themselves influence each other, but that people act and interact in a given economic environment and thereby change it. Economic data are the aggregated measurements of individual behaviour; in other words, economics consists for the most part of aggregated psychology. However, warnings and advice of representatives interested in interdisciplinary approaches found only limited reception among the majority of their 'orthodox' colleagues.

Gabriel Tarde (1902) in France was probably the first to use the term 'economic psychology'. His *La Psychologie Économique* drew attention to the need to analyse economic behaviour from a psychological perspective. He particularly criticized Adam Smith for not having incorporated his knowledge of human psychology, which he had demonstrated in his writings, into his concept of the economy. The existence of ventures in psychological thinking in Smith's work is described by Khalil (1996) in an essay on the 'Theory of moral sentiments'. Smith did not only emphasize the satisfaction of pecuniary, constitutive utility. Contrary to the orientation of modern welfare economics, he also stressed that self-respect is a chief ingredient of satisfaction. Hugo Münsterberg (1912) is seen as the initiator of this field of thought in the German-speaking world. He emphasized the need for close co-operation between psychology and the economic sciences. He began with studies on sociotechnology, on monotony in working life, on the selection of staff, and experimental research into the effects of advertising. However, his comprehensive approach was then put in the shade by developments in occupational and organizational psychology.

In the late 1940s, George Katona and Günther Schmölders began to design a psychology of macroeconomic processes. Katona's (1951, p. 9f) view of economic psychology is clearly described in the following quotation: '... the basic need for psychology in economic research consists in the need to discover and analyze the forces behind economic processes, the forces responsible for economic actions, decisions and choices ... Economics without psychology has not succeeded in explaining important economic processes and "psychology without economics" has no chance of explaining some of the most common aspects of human behavior.'

Together with Burkhard Strümpel, Katona criticized the economic model of the time as limited: 'The savings rate, for example, is seen as dependent on total income, the price level as a function of the money supply, the level of demand as determined by prices. The human being as the active agent at the centre of this dynamic picture is airbrushed out as an anonymous "black box" ... In fact, however, the human being who occupies the position in between his environment and the economic outcome of his behaviour is full of self-will. He is dominated by prejudices, mood-driven, impulsive, and poorly informed. He is exposed to changing influences, but forgets or neglects much of the fruit of experience, even occasionally jettisoning principles and overall concepts of the world. He transfers experiences and the wisdom they bring from one sphere of life to another, and even manages to alter economic expectations when important non-economic events occur. He learns.' (Strümpel & Katona, 1983, p. 225).

Among economists, the voice of Herbert Simon attracted particular attention. He saw restrictions to the validity of the widely accepted rational model, especially in man's limited cognitive capacities (for a collection of articles by Simon and scientists in the field see Earl, 2001). In an obituary for Herbert Simon, Augier (2001) quotes some important statements that express Simon's position clearly: 'The capacity of the human mind for formulating and solving complex problems is very small compared with the size of the problems whose solution is required for objectively rational behavior in the real world—or even for a reasonable approximation to such objective rationality' (Simon, 1982, p. 204). 'For the first consequence of the principle of bounded rationality is that the intended rationality of an actor requires him to construct a simplified model of the real situation in order to deal with it. He behaves rationally with respect to this model, and such behavior is not even approximately optimal with respect to the real world. To predict his behavior, we must understand the way in which this simplified model is constructed, and its construction will certainly be related to his psychological properties as a perceiving, thinking, and learning animal' (Simon, 1957, p. 199).

The development of economic models on the basis of a small number of axioms of human behaviour and the preoccupation with economic indices that rested on a set of norms of human behaviour, the realism of which was questioned less and less as the formulaic language of mathematical logic became more and more attractive, caused unease among economists. It stimulated an interest in everyday behaviour in the economic context. Economic psychology sets descriptive economic models against normative ones. In their book about the social psychology of economic behaviour, Furnham and Lewis (1986) make the useful distinction between economic psychology and psychological or behavioural economics. On the one hand, psychologists try to understand experience and behaviour in the economic context, and, on the other hand, economists who have found the straitjacket of traditional theoretical principles too restricting adopt findings from scientific psychology into the formal models.

'The ultimate criterion of all economic activities and economic policy is human well-being,' wrote van Veldhoven (1988, p. 53). He stated: 'In the end, all distribution of scarce means and goods serves the fulfilment of needs and aspirations and the achievement of satisfaction of individuals and groups. Thus, economic reality cannot adequately be understood without the analysis of the subjective and psychological dynamics that underlie and guide economic behaviour of both individuals and groups.' From about the 1970s onward, social scientists and economists have emphasized the importance of economic psychology and behavioural economy (Wärneryd, 1988, 1993). Lunt (1996), however, criticizes the attempts of economically oriented psychologists who adopt economists' agendas and introduce psychological insight into elaborate economic models. He claims that psychologists should start to examine economic theory to open new lines of collaboration that will allow them to apply their own conception of psychology to economics.

The International Association for Research in Economic Psychology (IAREP) was founded primarily by European psychologists and economists, and has the influential *Journal of Economic Psychology* since 1981. The Association successfully bridges psychology and economics. In the USA, there are two related associations consisting for the most part of a combination of economists and sociologists, concerned with behavioural concepts in economic matters: the Society for the Advancement of Socio-Economics (SASE) and the Society for the Advancement of Behavioral Economics (SABE), which publishes the *Journal of Socio-Economics*. Apart from the journals, economic psychology is represented in a number of introductory works (Antonides, 1991; Earl & Kemp, 1999; Ferrari & Romano, 1999; Furnham & Lewis, 1986; Kirchler, 1999; Lea et al., 1987; van Raaij, van Veldhoven, & Wärneryd, 1988; Webley, Burgoyne, Lea, & Young, 2001; Wiswede, 2000).

DECISION MAKING: UTILITY MAXIMIZATION AND RATIONALITY

Economic management means making decisions. The assumptions behind the metaphor of 'Homo oeconomicus' are that individuals make rational decisions, and that the option chosen from a set of alternatives is the best for the person concerned. People's decisions and behaviour are governed by the rules of logic. A small number of axioms form the basis for complex models of optimal decision making on the part of individuals and groups engaged in managing their economic affairs (Gravelle & Rees, 1981):

(a) When the best of a bundle of alternatives is to be chosen, an individual must clarify the characteristics of the various alternatives. These characteristics must be assessed, and all the apparently available options compared with each other. According to the principle of completeness, individuals are able to place alternatives in order of preference. In other words, they establish relationships between the alternatives, such that alternative A is better than or equal to alternative $B (A \succeq B)$, or B as good as or preferred to $A (A \preceq B)$, or the individual is indifferent between A and B $(A \approx B)$.

(b) According to the principle of transitivity, individuals create consistent orders of preference, and do not change their preferences arbitrarily. If, for example, a consumer believes alternative A to be better than or as good as alternative B, which is in turn better than or as good as alternative C, this consumer must also believe that A is better than or as good as C (if $A \succeq B$ and $B \succeq C$, then $A \succeq C$). If alternative A is as good as B and B as good as C, then the individual must also be indifferent between A and C (if $A \approx B$ and $B \approx C$, then $A \approx C$). This means that an alternative can belong to only one indifference set.

(c) The principle of reflexivity postulates that every bundle of alternatives is as good as itself $(A \approx A)$.

(d) Gravelle and Rees (1981) quote non-satiation as a further basic assumption. According to this principle, one bundle of alternatives will be preferred to another if it contains more of at least one good, and has the same quantity of other goods as the other.

(e) The fifth assumption, the axiom of continuity, states that it is possible to compensate for the loss of a certain quantity of good A by a certain quantity of good B, so that a person is indifferent to the quantity combinations (A, B) and $(A - X, B + Y)$.

(f) Lastly, the assumption is made that, when individuals possess a small quantity of good A and a large quantity of good B, they will only be indifferent to the loss of part of good A if they receive in addition a comparatively large quantity of good B. This is the axiom of convexity, and conforms to the law of satiation, according to which the relative increase in utility by one additional unit of a good diminishes with the availability of that good.

Utility maximization (frequently for egoistic goals, but sometimes for altruistic ones) and rationality are the fundamental assumptions of economics. Based on these assumptions, economics makes predictions of human behaviour in typical economic contexts, but also in other contexts, such as romantic relationships or criminality. The neoclassical paradigm has also inspired various avenues in psychology, such as theories of interaction between people in public settings and in intimate relationships (e.g., social exchange theories). These have been celebrated as 'deromanticized' universal theories, but also condemned as technical elaborations removed from reality.

The assumptions of rational theory or of Homo oeconomicus were often criticized, sometimes, however, on distorted grounds. Even economists do not exclusively view the human being as 'purposeful–rational, following pure considerations of utility, utterly subject to striving for gain, and equipped with the capacity to adapt to changing constellations of the market on the basis of a complete knowledge of market data (conditions of supply and demand), a state, therefore, of being totally informed (market transparency), with unbounded speed of reaction in adapting to changes in constellations of the market and acting accordingly, aiming at the greatest achievable utility' (von Rosenstiel & Ewald, 1979, p. 19). However, humanity is also not seen as drive-oriented, of limited cognitive ability, and thus often inconsistent by nature. The question that unsettles the very foundations of economics is whether human beings actually do pursue their goals in an economically logical way. What is it that people wish to or indeed can maximize? Is it egoistic profit, for themselves and others, or do they strive to act in accordance with society's moral demands? How consistent are orders of preference? Critics have also pointed out that in economic theory individuals are detached from their social context, and observed in isolation from other people, as if they operated in a social vacuum according to the principles of utility maximization and rationality. However, there are differences between isolated individuals who wish to act rationally, and the members of collective groups acting within the limits of rules and norms (Etzioni, 1988).

The clear formulae of economics have a certain fascination. At the same time, however, criticism aims at proceeding from the starting point of an unrealistic picture of humans, even if this picture is claimed to be a model of the average, free of unsystematically varying individual irrationality, and achieved by taking the aggregate of multiple individual actions. Frey (1990) distinguishes four possible states of individual and aggregated behaviour: individual behaviour may either correspond to or deviate from economic assumptions, and on the aggregated social level the predictions of the economic model may be fulfilled or not. The most desirable situation for followers of rational theory is when action on the individual level is rational and aimed at maximizing utility, and rational behaviour is also perceptible on the aggregated level. The second acceptable situation is where anomalies exist in individual behaviour, but disappear in the aggregation process, as happens in markets under conditions of perfect competition. However, in some cases, individual behaviour can be entirely rational, but the outcome on the collective level deviates from the rational model. This occurs when a particularly high value is placed on private goods, but public goods are devalued. Phenomena of this case are known as free riding; examples are tax evasion, offences against the environment, and the extensive use of common resources. Finally, in some cases, anomalies can be observed on both the individual and the collective level. Examples of such anomalies are those described as judgement heuristics and biases, where systematic deviations from rationality are transferred from the individual to the aggregated level of society as a whole.

DECISIONS: PSYCHO-LOGIC AND COOPERATION

The concepts of rationality and utility maximization are based on the assumption that people follow the laws of logic in choices and decision-making situations. In fact, even in situations of little complexity, the basic assumptions of economics are seen to be contravened. For a start, it is not certain whether individuals do generally try to maximize their own profit. Frijters (2000) found, for instance, only limited support for the hypothesis that people try to maximize general satisfaction with life. Pingle (1997) found that people often choose the option prescribed by the authorities rather than the one optimal to themselves.

The premise that decision-makers can rank-order the alternatives with respect to an overall ordinal value or utility, in order to choose the 'best', has frequently been shown to be violated. Li (1996) conducted an experiment in which two fundamental rational decision axioms, transitivity and independence of alternatives, were systematically contravened. Zwick, Rapoport, and Weg (2000) found violations of the invariance axiom in sequential bargaining. Huck and Weizsäcker (1999) report that subjects do not react to risk in a way that is consistent with stable expected-utility functions. When future private and social benefits are evaluated, the discounted expected-utility model, predicting exponential discounting, serves as a basic building block in modern economic theory. However, Loewenstein and Prelec (1992), Thaler (1981), and others show that subjects violate the predictions of the model in certain circumstances. Hyperbolic discounting seems to match subjects' behaviour better than exponential discounting (Laibson, 1997). The classical model also provides an inadequate explanation for the fact that people vote. The expected benefits from voting in a large-scale election are generally outweighed by the cost of the act (Downs, 1957; Schram & Sonnemans, 1996). Social norms and inter- and intra-group relations seem to provide a better explanation of voting behaviour than simple individual utility maximization (Cairns & van der Pol, 2000; Mador, Sonsino, & Benzion, 2000; Schram & van Winden, 1991).

The more complex and the less transparent a situation is, the more subjects deviate from what the rational model predicts. People behave differently according to the situation. Framing effects as described below show clearly how risk aversion can change. On the Internet, subjects bid higher for lotteries and standard deviations of bids are larger than in classrooms (Shavit, Sonsino, & Benzion, 2001). Besides the situational constraints, individual differences play a relevant role in economic behaviour. Supphellen and Nelson (2001) found effects of personality and motive structure for donating behaviour. Powell and Ansic (1997) report gender differences in risk behaviour and strategies in financial decision making. Such differences can be viewed as general traits, or as arising from context factors. The results of experiments conducted by Powell and Ansic (1997) show that women are less risk seeking than men, irrespective of task familiarity, framing, costs, and problem ambiguity. The results also indicate that men and women adopt different strategies in financial decision environments but that these strategies have no significant impact on performance. Because strategies are more easily observed than risk preference or outcomes in everyday decisions, strategy differences may reinforce stereotypical beliefs that women are less competent financial managers. Boone, de Brabander, and van Witteloostuijn (1999) argue that co-operation in bargaining and game settings depends on personality variables. Internal locus of control, high self-monitoring, and high sensation-seeking were systematically associated with co-operative behaviour, whereas Type A behaviour was negatively correlated with co-operation.

People often fail to grasp the full range of alternatives in order to select the best, resulting partly from lack of time, and partly from limited cognitive abilities and a lack of motivation to collect and process all the relevant information. There is clear confirmation of this in decision-making situations involving risk. In addition, people do not always behave selfishly in interactions; they co-operate even when their partners could exploit the situation in a harmful way. The occurrence of reciprocity and co-operation is confirmed in particular in game theory and in experimental markets (Fehr, Gächter, & Kirchsteiger, 1997; see also, e.g., Gigerenzer, Todd, & the ABC Research Group, 1999; Güth, 2000; Jungermann, Pfister, & Fischer, 1998; Lundberg, 2000; Mellers, Schwartz, & Cooke, 1998, Wärneryd, 2001; for a collection of classical articles on anomalies in decision making see *Behavioral Finance*, edited by Shefrin, 2001).

Research Paradigms and Methods

Behavioural economics and economic psychology test individuals' ability to determine what is best for them in choice settings such as lotteries, game settings, bargaining, and market settings. Usually, laboratory experiments are conducted. Davis and Holt (1993), Hey (1991), or Smith (1976) quite concretely prescribe how to conduct such experiments. For instance, participants in an experimental environment should behave as they do normally in the real world. To this end, the experimenter must establish an incentive structure, which in general proposes some type of reward medium to the subjects. Incentives should directly depend on the subject's actions, should not lead to satiation, and should be designed in such a way as to prevent all other factors that might disturb the subject's behaviour. Valid experiments also require participants to be honestly informed about the aims, and financial incentives are viewed as necessary to motivate participants to maximize their outcome. However, Bonetti (1998) finds little evidence to support the argument that deception must be forbidden, and Brandouy (2001) criticizes the prescription of financial incentives, since they do not always appear sufficient to subjugate individual differences between participants.

Apart from the postulated prerequisites for 'good' experiments, suggestions are made for the measurement of risk and of the value of goods. Critical statements on the issue of measurement of risk have been made by Krahnen, Rieck, and Theissen (1997) and by Unser (2000; see also El-Sehity, Haumer, Helmenstein, Kirchler, & Maciejovsky, forthcoming). The economic value of goods, usually public goods, is usually measured in 'willingness to pay experiments' Given the increased use of this approach, its validity needs to be assessed. Ryan and San Miguel (2000) made simple tests of consistency in willingness to pay and found that approximately one-third of subjects failed the test to be willing to pay more for a good A than for another good B, given that they preferred A to B. Chilton and Hutchinson (2000), Morrison (2000), and Svedsäter (2000) also question the validity of the technique.

Further problems are seen in the experimental approach. The method in economic studies is to investigate people's ability to collect and adequately evaluate relevant information, in order to select the best alternative. However, even if people were able to collect and assess the relevant information, the question remains as to what is relevant. Sacco (1996) argues that individuals behave rationally if they are able to gather all the information relevant for the optimal solution of their decision problems and if they are able to process this information optimally. In spite of its apparent simplicity, this definition becomes problematic once the meaning of 'relevant' is questioned. In general, being based on meta-empirical assumptions, individual judgements of relevance are not *per se* evidence of the decision-maker's degree of rationality. While the efficiency of the information processing procedure is a relatively unambiguous notion in the theory of rational decision-making, the same cannot be said for the judgements of relevance of the information processed. Individual decision-making processes are necessarily based on a set of meta-empirical assumptions that Sacco (1996) calls 'subjective metaphysics'. Every decision-maker's beliefs are conditioned by an idiosyncratic, subjective metaphysics that informs the individual's causal psychology and consequently judgements of relevance. Lundberg (2000) argues that market agents, such as traders, analysts, commentators, etc. must make sense of the conditions before taking any potential action. The complexity and pace of markets make multiple explanations, often of diametrically opposite nature, highly likely. On the aggregate level, divergent views are held by market 'bulls' and 'bears', respectively. On an individual level, it is likely that each agent may maintain more than one explanation of the present, as well as more than one projection concerning future market developments. Lundberg (2000) therefore argues that understanding the processes of sense-making would be an important step.

Economic theory is outcome oriented with the assumption that profit is maximized. One prominent and articulate advocate arguing that outcomes

are not all that matters for economic welfare is Sen (1993). Anand (2001) too argues for the relevance of the underlying procedure, especially in interactions between economic agents. Callahan and Elliott (1996) criticize the main research focus on outcomes rather than on sense-making and exploration of conceptual systems to learn more about the way in which actors both share meaning and understand specific events and situations. Other researchers complain that there is too little qualitative research being done, such as focus groups (Chilton & Hutchinson, 1999), aimed at understanding people's motives and considerations. Sonnemans (2000) stresses the importance of studying how subjects reason in economic settings, and Callahan and Elliott (1996) argue that, despite gaining increasing legitimacy within the economic profession, experimental economics is mainly restricted to theory testing.

Anomalies in Financial Decisions

In behavioural finance and decision making, much research has been done on the task of theorizing how to pursue optimal strategies, incorporating scientifically based maxims (Shefrin, 2001) as well as advice from successful experts in the field. If investors behave rationally, as the hypothesis of efficient markets presupposes (see Fama, 1998), there would be no need for a behavioural theory. All investors would decide on Bayes' probability theory, guided by probability calculations based on all available information. Efficient market theory and its components involve perfect competition in financial markets. This means that investors behave as if they had no market power over prices. Markets are frictionless, implying that there are no transaction costs, taxes, or restrictions on security trading. In addition, all assets and securities are infinitely divisible and marketable. It is assumed that all investors have homogeneous prior beliefs and Bayesian expectations. All investors simultaneously receive the same relevant information that determines market prices. Moreover, individual preferences are restricted in the sense that all investors care only about the risk and expected return trade-off, and all investors are rational-expectations utility maximizers. The theory of efficient markets deals with perfectly rational traders who do not neglect the information relevant to price development. All such information is public, and there is no private information that can repeatedly be used in order to earn excess returns. Prices are assumed to reflect future profits, discounted to today's value. In practice, however, there are 'noise traders', that is, traders who behave irrationally, and markets exhibit imperfections, such as Monday and January effects, weekend effects, the emergence of bubbles, and crashes (Wärneryd, 2001).

Many attempts to explain inefficiencies in financial markets invoke irrational behaviour of market participants. While the prevalent assumption among financial economists is that irrationality is unpredictable, researchers in behavioural finance have embraced ideas from cognitive psychology, according to which some deviations from rational behaviour can be explained and even predicted (e.g., Shefrin, 2001; Thaler, 1999). First, many studies on choice and decision making in practice suggest that genuine decision making is extremely rare. Most actions are routine or determined by habit (Katona, 1975). If choices and decisions are taken, non-rational people or 'noise traders' are frequently led by the behaviour of others, by their emotions and motives, they are overoptimistic and overconfident and perceive the situation as under their control, and they commit cognitive errors (Kirchler & Maciejovsky, 2002). Wärneryd (2001) summarizes a number of errors and biases that frequently occur.

Assuming asset traders are able to collect the available information and recognize what is relevant, are they then performing better than others who are not in possession of that information? Güth, Krahnen, and Rieck (1997) investigated to what extent insiders were able to exploit their advantage of being informed about an asset's fundamental value in a double-sided sealed-bid auction trading in high-risk assets. It was found that insiders could only partially make use of their advantage in terms of final portfolio values. Gerke, Arneth, and Syha (2000) also found no systematic overperformance of order book insiders. The authors conducted an experiment on the impact of order book privilege on traders' behaviour and the market process. A market participant who had insight into the order book received information about current trading opportunities and other traders' preferences and was thus privileged. Nevertheless, volatility and liquidity of the markets were not influenced heavily.

A particular problem for decision-makers is that they find it hard to follow the statistically prescribed probability updating, as postulated by Bayes' theorem. Updating can be defined as the process of incorporating information for the determination of probabilities or probability distributions. Incorporating new information presupposes the existence of some starting point: this is called prior knowledge. Updating can relate to probabilities or to parameters of distribution functions; that is, information can be used either to make estimations as to whether or not certain events will occur, or to make inferences about the parameters describing the process that generates such events. In the latter case, the estimated distribution can be used to calculate the probability that a certain event will occur. Updating involves the determination of new probabilities, given some new information. Behavioural scientists found that Bayes' rule is not necessarily efficient as a descriptive and predictive device. It is often misapplied or neglected in the process of updating. Huck and Oechssler (2000) found that subjects have difficulty in applying Bayes' rule correctly even if they are familiar with it, and appear to apply it by accident even if they do use it. Ouwersloot, Nijkamp, and Rietveld (1998) developed a model for measurement of the error in probability updating. In a laboratory experiment, the presumed

systematic impact of four characteristics associated with the messages given to the respondents was studied. For a large number of cases, probability updating resulted in outcomes that deviated significantly from Bayes' rule, and deviations were influenced by message characteristics such as precision, reliability, relevance, and timeliness.

Complex situations demand repetitive choices in a series of interdependent decisions where the state of the world may change, both of itself and as a consequence of previous actions. Wärneryd (2001) argues that decision-makers in such complex situations fail in goal formulation processes and are characterized by 'thematic vagabonding'. This is a tendency to shift goals: while trying to reach one goal, they shift to other goals, finally arriving at one that was never intended. In complex decision settings, when repetitive decisions are taken, dynamic problems solved, and intertemporal decisions made, it can hardly be expected that people will behave according to the theoretical solution of the problem at hand. Decision-makers are expected to work backward through the decision trajectories taking into account the principle of optimality. Anderhub, Güth, Müller, and Strobel (2000) and Müller (2001) show that, rather than applying backward induction, people reduce the complexity of the problem at stake and use heuristics to come to a solution. Investors make use of heuristics, such as representativeness, availability, anchoring and adjustment heuristics, that permit decision processes to be 'abbreviated', but can lead to biased estimations and judgements.

Additional anomalies result from the refusal to learn from experience, passivity, or external attribution of one's own failures. In hindsight, irrational decisions may be 'repaired' by reinterpretations and sense-making.

Prospect theory, endowment effect, and sunk costs

Since actors in financial markets need to form expectations about future developments, a central issue in decision-making is how individuals deal with alternatives that have insecure consequences. Prospect theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992) attempts to reconcile theory and behavioural reality in decision-making. It pays attention to gains and losses rather than to total wealth, assumes that subjective decision weights replace probabilities, and that loss aversion rather than risk aversion is an overriding concept. The human problem-solving process is assumed to involve two phases: editing and evaluation. The major component of the editing phase is assumed to be coding. This refers to the perception of outcomes as gains or losses relative to a subjective reference point, instead of in terms of the final state of wealth. Thus, contrary to the assumptions of standard economic decision theory, preferences are not invariant to different representations of the same problem. A further component of the editing phase is combination (i.e., simplifying choice options by combining the probabilities of identical outcomes). Segregation is the separation of the

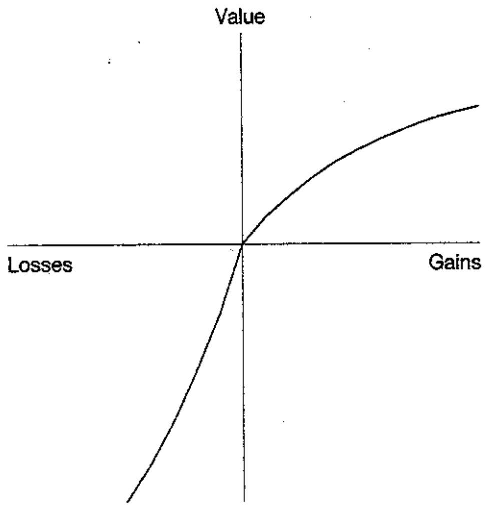

Figure 2.1 The value function (Tversky & Kahneman, 1981, p. 454).

certain component of lotteries from risky components. For example, the chance of winning a sum of 500 money units with probability $p = 0.80$ or of winning 300 units with probability $p = 0.20$ is decomposed into a sure gain of 300 and an 80% chance of winning an additional 200 units. Further components of the editing phase are cancellation, simplification, and detection of dominance. Probabilities of outcomes are often rounded to 'prominent' figures, and alternatives that are perceived as dominated by other alternatives are often rejected without further consideration. In the evaluation phase, decision-makers evaluate edited prospects, choosing the one with the highest value. Outcomes are defined and evaluated relative to a subjective reference point that represents the status quo of the individual's current wealth and marks the borderline between loss and gain. According to prospect theory, the value function is concave in gains and convex in losses, with additional gains or losses having diminishing impact. Furthermore, the function is steeper in losses than in gains, which indicates that losses loom larger than gains (see Figure 2.1).

The central implication of the value function is the basis for the principle of loss aversion. If losses are experienced or expected, people take risks to repair or prevent the loss; on the other hand, in gain situations decision-makers are risk-averse. Depending on the wording of a decision task, people perceive prospects as losses or gains and preference orders may be reversed. Such framing effects have frequently been confirmed. Departing from Tversky and Kahneman's (1981) Asian disease problem, Druckman (2001) presented participants with a survival format, a mortality format, or both. While the survival and mortality formats each replicated the original

experiment, Druckman (2001) shows how using both formats simultaneously provides a way to evaluate preferences unaffected by a particular frame and to measure the impact of frames relative to the baseline provided by the 'both formats' condition. For a critique on presentation formats of the Asian disease problem see, for instance, Kühberger (1995), Li (1998), and Wang (1996).

People buy insurances, but they also gamble and take investment risks. While people spend fortunes on lotteries, bets, and derivatives, the general assumption in economics is that people are risk-averse. Observations of how people deal with risks in real life have cast some doubt on the prevalence of risk aversion. People pay more than the expected value for insurance, and do likewise for lottery tickets. According to prospect theory, people are risk-averse for gains with high probabilities and for losses with low probabilities, risk-seeking for gains with low probabilities and losses with high probabilities. The tendency for people to be risk-seeking for gains with low probabilities is presumably enhanced as the sum involved increases. People will accept low probabilities to win large prizes in lotteries. The existence of large prizes with low probabilities would be more attractive than the possibility of winning smaller prizes with much higher probabilities. The most successful lotteries will then be those with high prizes and such low probabilities that the cost to the gambler can be held very low. Wärneryd (1996) investigated risk-taking in investments, playing in lotteries, and saving indices, and found that people who wanted to play safe asked for more than the required expected value. Most respondents showed risk aversion by preferring a prize that was certain to one that was probable.

Economic theory assumes that preferences are not affected by ownership. Thus, when income effects and transition costs are minimal, the amount a person is willing to pay for a certain good should equal the amount this person is willing to accept to give up this good. However, empirical research shows considerable differences between buying and selling prices of goods. Thaler (1992, p. 63) gives an example of what he calls the endowment effect: 'A wine-loving economist you know purchased some nice Bordeaux wines years ago at low prices. The wines have greatly appreciated in value, so that a bottle that cost less than $10 when purchased would now fetch $200 at auction. This economist now drinks some of this wine occasionally, but would neither be willing to sell the wine at the auction price nor buy an additional bottle at that price.' This apparently anomalous behaviour has stimulated much research, with most findings supporting the endowment effect. Stroeker and Antonides (1997) found that endowment effects can cause high reservation prices among sellers. Van Dijk and van Knippenberg (1996) conducted a market experiment with participants endowed with a bargaining chip that was convertible into real money after the experiment. The price was either fixed or uncertain, varying within a known range. Participants were allowed to trade their chips by offering and buying them among themselves. It was found that selling and buying prices differed only in an uncertain situation, supporting an endowment effect arising from loss aversion. Selling prices significantly exceeded buying prices. In past studies on the endowment effect, people traded goods that were difficult to compare (e.g., coffee mugs, pens). Van Dijk and van Knippenberg (1998) studied the comparability of trading deals by exploring the relationship between the comparability of the gains and losses of the deal and the willingness to trade consumer goods. It was assumed and confirmed that people are more willing to trade wines from the same country than wines from different countries. People become more loss-averse with increasing incomparability of the gains and losses involved. Hoorens, Remmers, and van de Riet (1999) studied the endowment effect in the evaluation of time. Subjects indicated a higher figure for the payment they should receive for doing household and academic chores for others, than they considered fair to pay to the same others for doing identical chores. Disentangling the target and transaction dimensions that are usually intertwined in demonstrations of the endowment effect, two elements were found: subjects indicated higher fair wages for themselves than for another person (target effect) and higher fair wages for selling time than for buying time (transaction effect). The conclusion is drawn that the endowment effect in the evaluation of time rests on a combination of mere ownership (causing the target person effect) and loss aversion (causing the transaction effect). Mackenzie (1997) criticizes research on the endowment effect as concentrating mainly on behaviour, rather than the underlying motives. He argues that alternative motives may account for not trading wine in Thaler's example. Information about how people behave offers a low standard of evidence about what motivated their behaviour. In essence, a focus on motives is needed in place of drawing simple conclusions from behaviour to motives.

People tend to let their decisions be influenced by costs incurred at an earlier time. They are more risk-seeking than they would be had they not incurred these costs. This finding, the 'sunk cost effect', seems to be in conflict with economic theory, which implies that only marginal costs and benefits should affect decisions. Zeelenberg and van Dijk (1997) investigated the effect of time and effort investments (behavioural sunk costs) on risky decision-making in gain and loss situations. Participants were given vignettes to read, asking them, for example, to imagine that they had carried out a dirty job. They were then offered either payment of 50 money units or 100 units with a probability of $p = 0.50$, the alternative being 0 units (with the same probability). On the basis that gain or loss was to be fairly determined, participants were asked to state whether they preferred the certain payment or the gamble. A large number opted for the 50 money units, on the grounds that the expected frustration, if they received no reward after having carried out the work, was too great. However, if the participants were offered either 50 money units in addition to their pay or, in addition to their pay, the chance to play a game that would bring them either 100 units or zero, each with a probability of $p = 0.50$, they chose the risky alternative. Realizing one alternative implies the loss of others, along with their consequences. In addition to risk propensity, anticipated regret (Loomes & Sugden, 1982) is a relevant factor in decision-making.

Capital asset pricing and portfolios

The theoretical economic models of portfolio theory and the capital asset pricing model offer a prescription of optimal investment behaviour. The idea is that, by integrating different shares into a portfolio, overall risk can be reduced below linear combination of single risks, unless assets are perfectly positively correlated. Diversification or widespread variance is the core of the model. Using information on the expected returns and expected risk of assets, the optimal mixture of assets resulting in an optimal portfolio for investors can be derived. However, as research in economics and psychology evidences, individuals and groups do not typically employ economically optimal behaviour. Various factors, such as limited information-processing capacity, lack of time, etc., are likely to impede rational decision-making.

A particular problem in portfolio allocation is the perception of risk. Measures of individual risk attitudes are required in financial management as well as in financial research. In asset management, for instance, investment allocation decisions will depend on clients' risk attitudes. Similarly, the analysis of individual portfolio choice in empirical and experimental research has to rely on an explanatory variable representing individual risk aversion. Various measures of evaluating risk aversion are in use. Krahnen et al. (1997) analysed certainty equivalents (i.e., the safe amount of money that leaves a decision-maker indifferent to a given lottery). In an auction experiment, the qualification of certainty equivalents as useful indicators of individual risk aversion was tested. Considerable deviation of evaluations over time was found. Krahnen et al. (1997) suggest using a multi-stage procedure, where parameter estimates are derived from a number of independent observations. Unser (2000) examined people's risk perception in a financial context and found that asymmetrical measurements of risk are superior to symmetrical risk measures such as variance.

Anderson and Settle (1996) investigated investment choice and the influence of portfolio characteristics and investment period. Portfolio allocation decisions require both fact judgements and value judgements. Fact judgements normatively require thinking about portfolio risk and return over a particular period on the basis of information about the mean, variance, and covariance of the component investments. Value judgements normatively require thinking about the consequences for lifestyle of various levels of return. The study focused on fact judgements and looked at estimates of return distributions at the end of an investment period, based on annual return distributions. This issue is important since people have no real appreciation of exponential growth, having difficulty with non-linear functions. On the other hand, financial information is usually about annual measures of risk and return, investors usually invest for periods exceeding one year, and financial returns compound exponentially. Anderson and Settle (1996) further investigated estimates of return distributions of portfolios, based on return distributions of their constituents. It was found that people are insensitive to distributional characteristics in creating portfolios on the basis of both one-year and ten-year data. The authors interpret the results in terms of representativeness and anchoring-and-adjustment heuristics and a mental accounts decision rule.

Co-operation and Reciprocity

Research on choice in social settings shows the importance of justice and fairness considerations, and thus demonstrates that not only the consequences but also the process of decision-making is important. Neoclassical economic theory views altruism, co-operation, and reciprocity as nonrational in most circumstances, whereas self-interest and exploitation of others should lead to the highest profits. However, much research has provided empirical support for the robustness of social norms.

Recently, there has been a marked increase in literature claiming that there is more to economics than simple optimality; as Etzioni (1988) puts it, 'economics has a moral dimension.' This means that economic decisions take into account what is 'right' as well as what is most profitable. An interest in the role of morality or ethics in economic behaviour can be seen in studies of the importance of fairness and reciprocity (Fehr & Gächter, 1998; Fehr & Schmidt, 1999), of ethical values (Burlando, 2000), of business ethics (Wärneryd & Westlund, 1992), and in popular models of ethical and financial markets (Winnett & Lewis, 2000). Studies of ethical investment have been concerned with whether 'ethical' is mainly a marketing label, whether the performance of ethical trusts has a specific ethical component, and whether ethical investors are different from others and prepared to incur some costs in order to invest ethically. Webley, Lewis and Mackenzie (2001) show that ethical investors are prepared to choose ethical funds as part of a mixed portfolio as long as they are performing reasonably, but enthusiasm for investing ethically drops if the financial return is poor.

The norm of reciprocity and considerations of fairness are strong determinants of economic behaviour. Van der Heijden, Nelissen, Potters, and Verbon (1998) examined the force of reciprocity in gift exchange experiments in which mutual gift-giving was efficient but gifts were individually costly. The reciprocity norm had a powerful effect on behaviour. De Ruyter and Wetzels (2000) report the strong effect of pro-social behaviour in the marketing context with soccer fans buying shares from their club in order to provide assistance in times of financial need. Church and Zhang (1999) found in a bargaining study that the majority of subjects were concerned about maximizing their pay-offs, but the second most frequent response was being fair to the other. Gneezy, Güth, and Verboven (2000) found that people in long-term contractual relationships, which can never be specified in all details, make decisions that are based on trust and reciprocity.

The basic assumptions and propositions of classical economic theory are frequently investigated using ultimatum games (Güth, Schmittberger, & Schwarzer, 1982). In the simplest version, one player (the allocator) is directed to divide a sum of money (the stake) between himself and a second player (the recipient). If the recipient accepts the proposed division of the stake, then both receive the amounts proposed by the allocator. If the recipient rejects the proposed division, then both players receive nothing. The recipient knows the size of the stake, but the players do not know each other. According to the model of Homo oeconomicus, allocators should offer the smallest possible amount that makes the recipient better off than nothing. For instance, if 100 money units are at stake and divisible into units of 1, then offering 1 unit makes the recipient better off than nothing and he should accept the division. The allocator would get 99 units, whereas the recipient gets 1 unit.

Several empirical studies strongly confirm that allocators are not as selfish as economic theory predicts, and recipients are not willing to accept the lowest possible amount. Huck (1999) investigated responder behaviour and motives such as equality, self-esteem, consideration of absolute and relative pay-offs, malevolence, fairness, and revenge. Five groups of responders with different motivations guiding their behaviour were detected: (a) malevolent subjects purely guided by their absolute pay-off; (b) malevolent and highly competitive subjects, who care for their own fair share in ultimatum bargaining and are willing to sacrifice a substantial amount of money to increase their relative pay-off; (c) non-malevolent subjects whose only concern is for their absolute pay-off. They prefer even small amounts of money to receiving nothing by inducing a conflict. (d) Non-malevolent but vain subjects who differ from cluster (c) only by rejecting 'peanuts'; and (e) non-malevolent participants with a real desire for equality, for whom fairness considerations matter most. Bethwaite and Tompkinson (1996) focused on motives that drive players in ultimatum games to offer, accept, or reject certain amounts: fairness, envy, altruism, or selfishness. Their study found the dominant motive to be fairness. Half the recipients had a concern for fairness; only one-quarter were motivated by selfishness and so had a utility function of the type conventionally assumed by economists.

The modal offer in ultimatum games is usually not the lowest positive amount, but the even split of the pie. While one explanation of such behaviour invokes the notion of fairness, a second explanation is that in the absence of common knowledge of the rationality and beliefs of recipients, allocators raise their offers because they expect that unsatisfactory offers might be rejected. In several experiments, selfish offers were successfully induced by manipulating the allocators' expectations. Suleiman (1996) argues that such manipulations are predominantly extrinsic and not accounted for by game theory. In his study, he introduced a minor variation of the ultimatum game by implanting a discounting factor in the standard game: if the recipient rejected an offer, the offered division was multiplied by a factor ranging from 0 to 1. The change was that, instead of receiving nothing at all if the recipient rejected the offer, the players at least received something by acceptance. Whereas game theory is indifferent to this modification, experimental results from the modified game showed that by continuously changing the discounting factor, it is possible to induce systematic changes in allocators' and recipients' behaviour and beliefs. The results show that the allocator is driven by expectations about the recipient's behaviour, but, at the same time, norms of fairness cannot be ruled out.

Experimental evidence indicates that individuals often exhibit other-regarding behaviour when bargaining with other people. Violation of the presumption of self-interest in neoclassic economic theory has promoted intense debate within behavioural economics, and many experiments have been conducted to detect conditions that push allocators to behave rationally (Cherry, 2001). Güth, Ockenfels and Wendel (1997) investigated co-operation based on trust in a basic sequential game, the so-called 'trust game'. The first mover starts by deciding between co-operation and non-co-operation, while the second mover can only react in the case of co-operation, either exploiting the other player or dividing the rewards equally. Trust and co-operation were shown to depend on how the positions of players in the game were chosen. Sonnegård (1996) tested whether the random choice of movers determines the amount given. While random choice had no effect, description of the property rights of the first mover determined giving. If the first mover was explicitly instructed to have the right to exploit the other player, then they offered less. In addition, high incentives led to less co-operative behaviour. If small stakes are to be divided and sequential games are played, individuals may try to explore the partner's acceptance level by varying the offered percentage of the stake (for exploration and learning in decision settings as well as boundedly rational decision-making see Güth, 2000; Albert, Güth, Kirchler, & Maciejovsky, 2002; Mitropoulos, 2001).

Self-interested behaviour may also increase when the stake to be divided is not known to the recipient. Murnighan and Saxon (1998) conducted ultimatum games with children and found that younger children make larger offers and accept smaller offers than older participants. Boys in the age group nine to fifteen years seem to take greater strategic advantage of asymmetric information than girls. Like adults, children accepted smaller offers when they did not know how much was being divided.

Why are people co-operative and take so much account of fairness norms?

Scharlemann, Eckel, Kacelnik, and Wilson (2001) argue that, although economists and biologists view co-operation as anomalous, since animals that pursue their own self-interest have superior survival odds to their altruistic or co-operative neighbours, in many situations there are substantial gains to the group if members co-operate. Individuals reap the benefits of co-operation if they are able to detect the intention in others to co-operate. For instance, smiling may be a signal of willingness to co-operate. Scharlemann et al. (2001) conducted a two-person, one-shot trust game with participants seeing a photograph of their partner either smiling or not smiling. Results lend some support to the prediction that smiles can be a signal of co-operation and can elicit co-operation among strangers. Trust was correlated with smiling but was more strongly predictive of behaviour than a smile alone.

ECONOMIC SOCIALIZATION AND LAY THEORIES

Children's Economic Knowledge and Behaviour

A knowledge and understanding of economic cause and effect assumes a process of maturation and socialization. Pre-school-age children know little of the production and distribution of goods, supply and demand, or other economic systems. Knowledge is still slight at the age of ten to eleven years, and a differentiated understanding cannot be assumed until the age of about 14 years.

Jean Piaget (1896–1980) developed a theory of the development of human intelligence that is also useful to describe the development of economic knowledge (Berti & Bombi, 1981; Kirchler, 1999). Piaget assumes that the development of intelligence is a process aimed at achieving and maintaining harmony of the individual and the environment. Knowledge can only be achieved by concerning oneself with an object. This concern with an object, whether concrete or imagined, brings about transformations, an act of adaptation. Adaptation is a fluid state of equilibrium between conforming or assimilating the environment to the person and conforming or accommodating the person to the environment. For example, there is an attempt to explain new and unfamiliar facts on the basis of the models or mental frameworks available to the individual. Assimilation processes involve the integration of unknown information into the available frameworks. Grappling with previously unknown facts eventually leads to a deeper understanding and to the differentiation and adaptation of the subjectively available explanatory models to the new facts, an act of accommodation. Cognitive development is a process of achieving increasing harmony between the assimilatory and accommodatory exchange processes between the individual and the environment. There is an associated process of generalization, differentiation, and co-ordination of the cognitive structures. The exchange processes between the individual and the environment enable individuals to proceed from an initial global condition to a cognitive structure that is enduring, flexible, and organized in a differentiated way, and permits logical thought.

Comprehensive studies on the development of children's economic knowledge have been carried out in Italy by Berti and Bombi (1981). In this area, too, as in Piaget's theory on the development of intelligence, children apparently begin with merely diffuse, unrelated economic concepts. They have little knowledge of the production of goods. Work, income, consumption, etc. are viewed as separate concepts and not related to each other. Increasing age brings comprehension of increasingly complex relationships, but only when children reach about the age of 14 years do they begin to develop a clear, complete picture of basic economic matters. Similar findings have been reported from various other countries (see *Journal of Economic Psychology*, 1990, Issue 4). Developmental stages in line with Piaget's theoretical model have been demonstrated in Hong Kong, North Africa, Europe, Australia, and North America. Bonn, Earle, Lea, and Webley (1999) investigate children's views of wealth, poverty, inequality, and unemployment in South Africa. The results show that the capacity to make inferences and integrate information about these concepts is most influenced by age, but that the particulars of the children's knowledge are influenced by their social environment. The process of knowledge acquisition can be accelerated by experience and training. Children in deprived areas and children from poorer families achieve differentiated economic knowledge earlier than other children, on account of the need to work for a low wage or to deal with materialistic options at an earlier stage. Further, talking to children about economic matters (Cram & Ng, 1994), training and instruction improve economic knowledge on the part of children and young people (Aquino, Berti, & Consolati, 1996).

Children attain economic knowledge, and they are addressed as appropriate economic partners by advertisers. In some cases, children and young people are given a considerable say in joint purchasing decisions (see Kirchler, Rodler, Hölzl, & Meier, 2001). In some cases, they have autonomous control of sizeable sums of money. Children receive pocket money, presents of money, and modest financial reward for minor tasks in the home. According to Furnham (2001), over 88% of parents questioned in his study thought that children should receive pocket money from the age of about six years. The amount of pocket money increases linearly with age, and children spend and indeed save part of their money, independently of the funds at their disposal. On average, boys receive more pocket money and bigger presents than girls (Furnham, 1999, 2001).

Lay Theories

While the representations of the experts about their knowledge are detailed and logically structured, lay people tend to rely on everyday experience to

construct cognitive frameworks by which to plan and rationalize behaviour and integrate new information into their existing fund of knowledge. Although Furnham (1997) maintains that in investigating work and economic values, people have coherent socio-economic, ideological belief systems, this in fact merely signifies that the 'subjective theories' are consistent in themselves, but serious differences exist between individuals and it is difficult to generalize.

It must, however, be stressed that even economists' knowledge or the resulting political advice on economic matters need not be unified. The principle that individuals construe reality in different ways is also evident in the way that politicians and economic experts construe policies (Theodoulou, 1996) and their implications. Different individuals have different systems of thought; these may be viewed as different strategies, which they consistently use to make sense of the world. Theodoulou (1996) studied the way in which Labour, Conservative, and Liberal Democrat experts in economics and business matters construe economic and political reality. She found significant differences between Labour and Conservative Party supporters in their preference for propositional, aggressive, pre-emptive, and hostile construing.

Lay theories have been investigated mainly from the point of view of attribution theory and the theory of social representations. Following the fall of communism in Eastern Europe, Antonides, Farago, Ranyard, and Tyszka (1994) and Tyszka and Sokolowska (1992) investigated lay conceptions of economic values and desires. Williamson and Wearing (1996) interviewed 95 individuals about the present state of the economy and expectations over the short and long term, confidence in organizations involved in the Australian economy, current information about the economy, and other related issues. The authors detected as many unique cognitive models as individuals interviewed. Despite the differences between them, there were some broad areas of agreement. In general, individuals described the economy by integrating economic, social, psychological, and moral issues. In some respects, previous findings suggesting that lay people know little about fiscal issues were confirmed. However, the cognitive models showed that lay people did seem to understand some connections between government revenue and expenditure.

Specific topics include above all lay concepts of poverty and affluence and their subjective causes. Poverty and wealth are often attributed to internal causes. Christopher and Schlenker (2000) studied perceived material wealth. Participants in their study were given vignettes to read that described a person in either an affluent or not so affluent home setting. The affluent target was evaluated as having more personal ability, such as intelligence and self-discipline, was perceived as having more sophisticated qualities, for example, as being cultured and successful, and as having a more desirable lifestyle than the not so affluent target. However, affluent people were judged as being less kind, likeable, and honest. Studies examining the individualistic, fatalistic, and structural dimensions of poverty showed that the majority of Americans explain poverty in individualistic terms (Hunt, 1996). Abouchedid and Nasser (2001) examined causal attributions of poverty among Lebanese students and found higher ratings for structural explanations than for individualistic ones.

Other specific topics relate to unemployment, borrowing and debt, the burden and equity of taxation, and personal consumption. The conclusions generally confirmed that lay people believe in a 'just world': respondents thought that people in difficult situations are usually themselves to blame (Kirchler, 1999). As regards the state, citizens in many countries are sceptical. Taxes in particular are not always seen as a necessary evil. Opinion surveys show that most people want a reduction in taxes, but, inconsistently, at the same time favour a rise in state spending in almost all areas. The public welcomes the benefits of public goods, but is becoming ever more unwilling to pay the cost (Tyszka, 1994; Williamson & Wearing, 1996). Kirchler (1998) investigated the attitudes of the self-employed, entrepreneurs, public employees, students, clerical and blue-collar workers to taxes. They found not only a general suspicion that taxes were not being used appropriately, but fear that the distribution of the burden was neither horizontally nor vertically fair. For entrepreneurs and the self-employed, who pay taxes 'out of pocket', there was also the problem of the experience of loss and the sense of demotivation and the restriction of freedom.

A glance at consumer behaviour shows that purchasing behaviour permits some interesting conclusions about subjective theories, values, and desires. First, subjective images of the economy direct people's actions, and, second, behaviour is a source of information about the person. Dittmar and Drury (2000) emphasize the role of personal consumption as providing a picture of the person: 'The self-image is in the bag!' Impulsive buying, consumption, and regret have complex meanings beyond those that can be measured easily in survey research. Janssen and Jager (2001) emphasize the need for identity, which explains in part the dynamics of consumer markets. Kasser and Grow Kasser (2001) investigated the dreams of people with high and low levels of materialism. People high in materialism reported more insecurity themes (e.g., falling), more self-esteem concerns, and dreams about conflictual interpersonal relationships. People with low materialism reported dreams where they were able to overcome danger, and typically moved toward greater intimacy in their dreams. The authors interpret their findings as supporting the notion that feelings of insecurity might be connected with the pursuit of material values. Consumption as economic behaviour is an expression of individual values and desires, and subjective constructions of the self, society, and the economy.

ENTREPRENEURSHIP AND ISSUES OF ECONOMIC PSYCHOLOGY IN THE COMMERCIAL COMPANY CONTEXT

Entrepreneurs, commonly seen as sensitive to economic and social phenomena, far-sighted, and prepared to take risks, fundamentally shape and innovate economic life by their activities. From the perspective of economics, the role of the entrepreneur is strictly determined by market transactions, and entrepreneurs have no freedom to develop their own individual characteristics. There would therefore be little relevance in devoting scientific attention to the personality of the entrepreneur. From a psychological perspective, the particular tasks and activities of the entrepreneur do, however, imply that certain personality traits are relevant for initiative and exercise of the enterprise function, and that it should be possible to find psychological distinctions between entrepreneurs and other market participants. In particular, personality and motivational structures, religious convictions, and value concepts have been investigated as supposed determinants of entrepreneurial success (Kirchler, 1999).

If entrepreneurs are to make independent decisions, take action, and bring innovative ideas into effect, they should carefully analyse business-relevant information. Bailey (1997) found that managers with greater 'need for cognition' produced a more thorough information search in the judgements of job candidates. It can further be presumed that entrepreneurs need to be independent of others, prepared to take risks without being blind to risk, interested in social contacts, and emotionally stable. Brandstätter (1997) studied owners of small and medium enterprises and people interested in setting up a private business. A personality checklist showed that owners who had personally set up their business were emotionally more stable and more independent than those who had taken over their business from parents, relatives, or by marriage. People interested in setting up their own business had similar personality characteristics to founders. Individuals who had personally founded their businesses or planned to do so, and who achieved high scores for independence and stability, were happier with their role as entrepreneurs, more satisfied with past success, more confident of future success, more inclined to attribute success to internal causes, and more likely to be thinking of expanding their business than those who scored low for those factors. Korunka, Frank, and Becker (1993) also report high independence scores for successful business founders. It remains speculation whether the features in the personality questionnaires can indeed be causally linked to business success. The personal self-descriptions of the respondents may be partly reality, partly wish, partly the cause, and partly the effect of past business experiences.

Various findings exist as to entrepreneurs' readiness to take risk. On the one hand, high risk propensity is seen as a precondition of innovation; on the other, precipitate action can be commercially disastrous, and the careful weighing of the consequences economically wise. Only where the probability of success of a particular action is sufficiently high is it worth taking a certain risk. In a three-dimensional system with the dimensions of innovativeness, reasoned goal-directedness, and risk propensity, Wärneryd (1988) places the successful entrepreneur at that point where both the inclination to strike out on new paths and the desire for success are particularly high, and where the readiness to bear a certain degree of risk in the case of success-promising actions is also above average. Actions with little promise of success are avoided. Successful entrepreneurs appear to give particularly careful consideration to risk. Frank and Korunka (1996) stress that risk propensity must be analysed in a situation-specific context: in their study, successful entrepreneurs were particularly oriented toward action and decision in the face of possible failure, but persistent in holding on to the situation in success.

Entrepreneurs and managers should be able to make reasonably accurate economic prognoses. Anderson and Goldsmith (1997) investigated managers' profit expectations, the degree of confidence placed in their profit forecasts, and investment levels. In most industries, investment increased both when managers were more optimistic and when they exhibited greater confidence in a forecast. Aukutsionek and Belianin (2001) studied the quality of forecasts and business performance by Russian managers. Forecast quality was typically poor, and most managers exhibited overconfidence by judging their forecasts as good.

A particularly relevant decision to be made by entrepreneurs is whether to wait or to become active and found a company. Davidsson and Wiklund (1997) show that values, beliefs, and culture have an effect on regional new firm formation rates. In discussing the market entry decision and the interaction between an incumbent firm and a potential entrant, the focus in the literature has been on two aspects: the strategic implications of having a first-mover advantage, and the different asymmetries that may be created by the incumbent, for example, cost asymmetries, capacity asymmetries, brand loyalty, or any other factor that affects the firm's profit functions. Important managerial decisions such as entry into new markets and exit from existing markets are made by people, and people are characterized by bounded cognitive abilities. Facing seemingly similar decision problems, individuals might evaluate them differently and therefore might come to different conclusions. Fershtman (1996) analyses incumbency using prospect theory, and explains firm decisions by the company's reference points. The managers of the incumbent company evaluate decisions from the point of view of being within the industry, while, for the management of the entrant, the reference point is that of being outside the industry. The difference in the reference points leads to different market decisions.

Varying reference points and loss aversion are also relevant for changes in management. Replacing one manager by another, even with the same qualifications, may have an important effect, as it introduces a manager with a different reference point. For example, following a recent loss, a manager might retain the reference point held prior to the loss, since any adjustment of reference points is not necessarily immediate. Replacing the manager may induce different managerial behaviour simply because the new manager may refer to the new status quo as his reference point. Another interesting point is the possible effect of sunk costs: a manager with a particular point of reference might attempt to repair losses by remaining in the market, whereas a newly appointed manager might take the status quo as a starting point, see no hope for the future, and leave the market. A further effect of loss aversion is inaction inertia. Participants who fail to act on an initial opportunity are less likely to act on a second somewhat less desirable opportunity compared with participants who did not experience inaction (Tykocinsky, Pittman, & Tuttle, 1995). Butler and Highhouse (2000) showed that decisions to sell a corporation are less likely after failing to act on a previous offer.

Entrepreneurs and managers often make decisions under time pressure and in the face of inadequate information about alternatives and consequences. Economic theories of the firm assume rational decisions; Wakely (1997) proposes a model using the theory of bounded rationality and shows that managers, starting from their aspiration levels, aim at satisfying results and not at optimal solutions. Kristensen and Gärling (1997) prove that, in commercial transactions, considerations of fairness, the prospect of further co-operation, and the build-up of trust are of greater significance than the rational model would imply. The variables of profit-orientation and fairness are also relevant in the interaction between consumers and commercial companies. A company that is solely profit oriented risks both image and customer loyalty. Seligman and Schwartz (1997) studied the role of fairness in economic situations by referring to Kahneman, Knetsch, and Thaler (1986). Respondents made fairness judgements with the aim of deriving descriptive generalizations of people's intuitions about the fairness of companies in economic transactions. Typical questions asked respondents to judge the fairness of an imaginary commercial company's action, as in the following example: 'A hardware store has been selling snow shovels for $15. The morning after a large snowstorm, the store raises the price to $20.' The results confirmed the findings of Kahneman et al. (1986) on fairness judgements made for companies. However, they also demonstrated that people judge parallel actions by individuals as fair. People apply different standards to individuals and companies because of presumed differences between them in wealth, power, and size. When companies are portrayed as no more powerful or wealthy than individuals, differences in fairness judgements were eliminated. Further, respondents were less inclined to judge the behaviour of a commercial company harshly when the company was identified with an individual than when it was large and anonymous.

Work Experiences and Income

Work experiences are mainly investigated by occupational and organizational psychology. Economic psychology concerns itself primarily with pay as a factor for motivation and productivity, and with the factors determining pay.

Tang (1996) investigated the acceptance and justification of differing levels of pay. When allocating money to different positions, men who value money highly have a strong preference to reward those who occupy the highest positions and to offer very little to those in the lowest ones, while no significant differences were found for women. For men with positive attitudes toward money, those who have power and authority deserve to have more money than those who do not.

What determines the level of income? Plug (2001) asked whether schooling pays off with regard to income. This seemingly simple question puzzles many economists and no full answer appears to be known. Groot and van den Brink (1999) investigated work stress from an economic perspective and the monetary equivalent of stress. Evidence was found that men report stress more frequently than women and there is a sizeable compensation for work with stress. Workers in jobs with stress earned 6–9% more than they would have earned in jobs without stress. Physical attractiveness was also studied as a determinant of income (see Bosman, Pfann, Biddle, & Hamermesh, 1997; Kyle & Mahler, 1996). Schwer and Daneshvary (2000) report that, in general, less attractive people earn less than better looking people. Attractiveness was found to influence income attainment for men, older individuals, and those employed in predominantly male occupations and in occupations that rely on person-to-person contact, and in which appearance may influence economic productivity. The starting salary of men was significantly influenced by their attractiveness, but not so for women. However, both attractive women and men earned more over time. Schwer and Daneshvary (2000) found that persons employed in occupations in which appearance could influence job performance frequented other types of hair-grooming establishment and attached more importance to their appearance.

From a managerial perspective, paying a fair wage is important because workers evaluate their compensation by comparing it with that of others of similar standing. Motivation to work, satisfaction, and organizational commitment depend on fairness perceptions. From a purely economic perspective, wages should be as low as workers can just accept. Fehr, Kirchler, Weichbold, and Gächter (1998) and Kirchler, Fehr, and Evans (1996) contrasted the implications of standard economic theory with social exchange predictions. According to standard economic theory, workers and employers are rational, egoistic individuals who strive to maximize profit. In markets, as well as in bilateral interactions, employers should offer the lowest wages that workers will accept and workers should provide the effort level that maximizes their utility (i.e., the minimum permitted). According to social exchange principles, wage negotiations between employers and workers are not only determined by egoistic profit maximization but also by social norms, such as reciprocity. Employers are assumed to trust reciprocation norms and offer higher than reservation wages, expecting workers to provide higher effort in response. Consequently, workers' effort choices are expected to be positively correlated to employers' wage offers. Reciprocation norms were found to be important and, on average, co-operation was considerably higher than predicted by economic theory. However, there were significant differences between participants: some workers reciprocated higher offers over a series of bilateral trading periods and in market situations, whereas others did not. Besides social norms, altruism, reciprocity, and competition motives were important. Falk, Gächter and Kovács (1999) investigated opportunities for social exchange in games with incomplete contracts and found similar evidence for the importance of fairness and reciprocity.

Workers work hard for money and harder for more money. Goldsmith, Veum, and Darity (2000) studied the efficiency wage hypothesis, which states that firms are able to improve worker productivity by means of a wage premium (i.e., paying a wage above that offered by other firms for comparable labour). A link between wage premiums and productivity might arise for a number of distinct reasons: a wage premium may enhance productivity by improving nutrition, boosting morale, and encouraging greater commitment to company goals; it may reduce leaving rates and the disruption caused by turnover, attract higher quality workers, and inspire workers to greater effort. Goldsmith et al. (2000) used locus of control as an index of effort and found support for the efficiency wage hypothesis.

To a large extent, people judge their personal welfare by comparing it with others within their local environment. Workers' tendency to evaluate their compensation by comparison with other, similar workers has been a topic of much empirical and theoretical interest. Not only money and effort, but also non-monetary compensation such as work status is compared. Schaubroeck (1996) argues that an understanding of organizational attachment may be facilitated by examining the local hierarchies in which workers trade off income for status. Within this perspective, individuals seek alternative employment when the income–status balance is not to their liking. Frank (1985) argued that the utility of a given pay level is a function of its rank within the organization (i.e., 'pay status') and the absolute level of the pay. Higher pay confers status relative to others in the organization because it signals the importance of individuals to the organization as well as their ability to acquire positional goods. Individuals will therefore choose their employing firm based on their relative preference for status.

Unemployment

Psychologists have offered theories to explain how experiences of joblessness may lead to a decline in mental health in general and various aspects of emotional health and self-esteem in particular. Goldsmith, Veum, and Darity (1996) claim, however, that omitted variables, unobserved heterogeneity, and data selection have prohibited the emergence of a consensus on the impact of unemployment on self-esteem. They investigated data from the US National Longitudinal Survey of Youth that provide detailed information on the personal characteristics of individuals in the sample, including self-esteem as well as their labour force experience. Goldsmith et al. (1996) found clear evidence that joblessness damages self-worth. Unemployment significantly harms self-esteem, and the effect of such exposure persists.

Unemployment is a critical life event leading to lack of self-confidence, helplessness, hopelessness, inefficiency, fatalism, fear of the future, and depressed mood in both Western industrialized countries and developing countries. The unemployed, educated young men in India who took part in a study conducted by Singh, Singh, and Rani (1996) on self-concepts of unemployed had generally rated themselves relatively low, though moderate, on variables concerning private and social self. In addition, most participants indicated suffering a considerable amount of social conflict.

While the negative impact of unemployment on psychological health is well known, less is known about how people cope with the problems associated with unemployment, one of which is economic deprivation. Waters and Moore (2001) examined the interrelationships between employment status, economic deprivation, efforts to cope, and psychological health. The results suggest that economic deprivation is experienced differentially in respect of material necessities and meaningful leisure activities, with unemployed respondents differing from employed on levels of deprivation for meaningful leisure activities but not for material necessities.

A topic of interest in labour economics is the extent to which past unemployment has an effect on current labour market status. Empirical results on unemployment hysteresis are, however, contradictory. Darity and Goldsmith (1993) utilized social psychological research on the effects of unemployment to explain unemployment hysteresis. Unemployment gives rise to a general sense of helplessness, and it is reasonable to conclude that this sense of not being in control will also be positively correlated with the length and frequency of spells of unemployment. Elmslie and Sedo (1996) developed an economic model of unemployment hysteresis based on social psychological findings, especially learned helplessness theory. They showed that perceived labour discrimination leads to several adverse psychological conditions that impair an individual's human capital characteristics such as learning abilities and motivation, resulting in turn in decreased future employability. In this way, unemployment ultimately has high social economic costs.

HOUSEHOLD FINANCIAL BEHAVIOUR

Purchase decisions as spontaneous, habitual, extensive individual decisions, or joint decisions between partners and their children are a relevant research field in marketing and consumer psychology with a long tradition (Kirchler et al., 2001). In addition to partners' spending behaviour, economic psychology concerns itself with their savings decisions (e.g., Wärneryd, 1999), decisions relating to credits and debts (e.g., Walker, 1996), loan and loan duration estimations (Overton & MacFadyen, 1998), including loan credibility judgements (Rodgers, 1999), money management in general, and open-mindedness toward innovations in the money sector, like wall-banking (Pepermans, Verleye, & van Cappellen, 1996).

Traditional microeconomic theory focuses primarily on the behaviour of the individual, whereas microeconomic applications focus on the behaviour of the household. The maintained approach is to assume that the household acts as an individual and has a unique welfare function. Katona (1975) established the importance of social perception variables in mediating the impact of economic conditions on financial decision-making. Lay perceptions of the economy are important mediators between economic conditions and economic behaviours. People respond to their perceptions of present and future economic conditions rather than directly to objective features of the economy, and these perceptions are also heterogeneous between individuals when living in the same household. However, Plug and van Praag (1998) found considerable similarity in the household members' construction of family equivalence scales of welfare. Where the age and educational characteristics of partners in the household are identical, then, according to Plug and van Praag (1998), a single welfare approach can be justified for the description of household response behaviour. From a social psychological and consumer psychological perspective (Kirchler et al., 2001), it is, however, problematic at the very least to assume that husband and wife and their offspring have similar views of the dynamics of spending and saving behaviour. Approximately one-third of responses of partners differ when they are asked who influences what decisions, and how decisions are reached. Viaud and Roland-Lévy (2000) apply social representation theory to study consumption in households when facing credit and debt, and find different intra- and inter-household constructions of money matters.

The interest of economic psychologists in household savings behaviour has increased in recent years. Wärneryd (1999) has produced a comprehensive survey of the literature on saving, and a special issue of the *Journal of Economic Psychology*, 1996, is dedicated to household savings behaviour. While, in economics, saving is mainly analysed within the framework of the life cycle hypothesis, Wärneryd (1999) emphasizes the importance of psychological phenomena, such as attitudes, expectations, and subjective concepts of savings in general.

Analysing savings discourses, Lunt (1996) found that people base their understanding of economic change on broader conceptions of psychological, social, and political change. People are aware of the increased opportunities made available through the deregulation of the financial markets and the shift in institutional forms of banks. They are also aware that this can lead to chances and dangers for the consumer. Changes led to a new climate for consumption marked by increased individual responsibility for insurance (as an investment rather than for risk reduction: Connor, 1996), as opposed to institutional methods, along with increased uncertainty over both the methods of insurance and the present and future risks that the individual and family face.

Households are extremely risk-averse, but still the degree of risk aversion varies considerably between households. Pålsson (1996) examined household risk-taking in Sweden. Based on a standard model of intertemporal choice, relative risk aversion can be expressed in terms of the proportion of total wealth invested in high-risk assets and the price of risk. Since households tend to construct different portfolios, consideration was taken not only of differences in the proportion invested in high-risk assets, but also of differences in the composition of the high-risk assets. Pålsson (1996) showed that aggregate, relative risk aversion coefficients are generally high and increase with the age of household members. Donkers and van Soest (1999) analysed three subjective measures of household preferences that can influence the household's financial decisions: time preference, risk aversion, and interest in financial matters. The relations between these variables, family income and family characteristics, and financial behaviour related to housing and ownership of high-risk financial assets were assessed. Risk aversion was negatively correlated with decisions to invest in high-risk financial assets. Also, risk aversion increased with age, and women were more risk-averse than men. Households with higher incomes and men were found to be more interested in financial matters, and consequently more likely to own high-risk assets.

What forms of saving do households choose and what strategies do they use? Groenland, Kuylen, and Bloem (1996) found savings related to banking options (e.g., savings accounts), old age (e.g., pension schemes), durables and own property (e.g., buying a house). Three characteristics of saving seem to be relevant for savings decisions: saving may be contractual or non-contractual, interest on savings may be fixed or non-fixed, and saving may be aimed at increasing one's personal wealth or at maintaining the value of one's capital over time. Wahlund and Gunnarsson (1996) studied phenomena of mental discounting across households and found specific savings strategies. In two additional studies, the authors identified residual savers, contractual savers, security savers, risk hedgers, prudent investors, and divergent strategies. Residual saving strategies were found to be the most frequent, followed by contractual saving, security saving, and risk hedging. The observed variation in preferred savings strategies depended on time preference measures, degree

of financial planning and control, interest in financial matters, attitudes toward financial risk-taking, propensity to save, and financial wealth (Gunnarsson & Wahlund, 1995, 1997).

The motives for saving differ across cultures (Jain & Joy, 1997) and households, and seem to vary depending on personality characteristics (Brandstätter & Güth, 2000). It can be assumed with regard to influence in joint decisions about savings and money matters that the more a partner is interested and expert on an issue, the higher this partner's influence in joint decisions (Kirchler et al., 2001). Meier, Kirchler, and Hubert (1999) report that in savings decisions and decisions about investments in assets, the expert partner is more influential, and men are generally more influential in partnerships with traditional role orientation.

MONEY AND THE EURO

An exact definition of money is hard to give, and Snelders, Hussein, Lea, and Webley (1992) term money a 'polymorphous' concept. Rumiati and Lotto (1996) asked experts, such as bank clerks, and non-experts to judge the typicality of a list of money exemplars. Three factors emerged: ready money (e.g., coins and banknotes), bank money (e.g., cheques, bank drafts, credit cards, bank cards) and money substitutes (e.g., vouchers, telephone cards), with the first factor prototypical for money. From an economic psychological perspective, in recent years the use of credit cards (Hayhoe, Leach, & Turner, 1999), acceptance of wall-banking (Pepermans et al., 1996), and attitudes toward money (Lim & Teo, 1997) were in the focus of research.

Another issue is the subjective value of money and the subjective perception of prices. With regard to price perception, Kemp and Willetts (1996) found that people who estimated present, past, and future prices of wool, butter, stamps, and general living costs, have no correct memories of prices. More recent prices are frequently underestimated, while overestimations are likely to occur when subjects are asked to estimate prices more than a decade ago. Brandstätter and Brandstätter (1996), asking what money is worth, report that the utility of money is a function of income (low income, high utility) and personality characteristics, such as extroversion and emotional stability. When subjects were asked to categorize levels of annual income as poor, nearly poor, etc. to prosperous, income and family size were important determinants. Using the method of just noticeable pay increments, Hinrichs (1969) asked employees what amount of pay increase they would rate on a five-point scale ranging from 'barely noticeable' to 'extremely large'. The marginal utility of the same additional amount of money should be higher for low-income individuals than for rich people. According to Weber's law, a just noticeable difference, measured in physical units, is a constant proportion of the magnitude of the standard stimulus, expressed in the same physical units. This was roughly true in Hinrichs' survey. However, Champlin and Kopelman (1991) and Rambo and Pinto (1989) failed to replicate these findings. Brandstätter and Brandstätter's (1996) study tested the validity of Steven's power function and the influence of monthly net income, attitudes toward money, and personality traits on the subjective value of money. People had to imagine winning or losing certain amounts of money and to indicate their resulting emotions, such as joy and anger. It was found that the subjective value of money is not a simple power function of the amount of money, nor is the monthly net income the only determinant of emotional responses to imagined gains and losses of money.

The euro, replacing the national currencies in 12 European Union countries, has received considerable attention in the years leading up to the transition. Discussion in the economic literature has focused primarily on the macroeconomic consequences at the European level, such as the effect on inflation rates, economic growth, and levels of employment. Considerably less attention was paid to the anticipated social, cultural, and personal consequences of the single currency. The regular Eurobarometer studies conducted by the European Union have included questions about attitudes toward the euro. However, these opinion surveys do not provide sufficient information about people's underlying hopes, fears, expectations, and values.

Pepermans, Burgoyne, and Müller-Peters (1998) report on a large-scale project conducted in 1997. In all countries of the European Union, data were collected on involvement and knowledge concerning the euro: satisfaction and values, national identity, national pride and European identity, control and expectations, fairness and equity. Pepermans and Verleye (1998) clustered all countries on dimensions such as national economic pride and satisfaction, self-confidence, open-mindedness, and progressive non-nationalistic attitudes. The majority of socio-psychological variables measured in that project had a significant impact on attitudes to the euro. Particular importance attached to knowledge and involvement, life satisfaction and values, national identity and pride, economic expectations, and fairness considerations. Van Everdingen and van Raaij (1998) found macro- and microeconomic expectations affecting attitudes toward the euro. Müller-Peters (1998) concentrates on national identity and its impact on attitudes to the euro. National identity was seen either as a dimension of pure categorization, resulting in patriotism, or as a dimension of discrimination, resulting in nationalism. This distinction of European and national patriotism, on the one hand, and the nationalistic stance, on the other, had particular explanatory force. The former fostered a positive attitude toward the euro, while the latter had a negative impact. Similar results were found by Kokkinaki (1998) and Luna-Arocas, Guzmán, Quintanilla, and Farhangmehr (2001). In the UK, which was not introducing the euro at that time, Routh and Burgoyne (1998) found two kinds of attachment to national identity,

cultural and instrumental attachment, each having both direct and indirect influence upon anti-euro sentiment. It was found that only cultural attachment had a direct, amplifying effect upon anti-euro sentiment. Meier and Kirchler (1998) studied the emotional and cognitive roots of attitudes toward the euro. While people opposing the new currency were found to argue mainly on an emotional basis against the euro, people supporting the replacement of national currencies argued in terms of economic, political, and private advantages. Indifferent or neutral attitudes were mainly held by people who claimed not to be properly informed about the procedure of replacement of national currencies and the consequences of the euro.

TAXES AND TAX EVASION

Tax behaviour as a direct link between individual and state has received special attention in economic psychology. In general, taxation is rejected by the population at large, although the state is expected to make public goods available. The reasons for the rejection of taxes include the view that there is little transparency on spending and that politicians introduce taxes for their own ends. Indeed, Ashworth and Heyndels (2000) report that politicians care about electoral, ideological, and self-esteem motives when defining the level of tax burden in their jurisdiction.

The complexity of tax legislation and lack of transparency in the use of funds is decisive for the rejection of taxation. Complexity has been cited as the most serious problem currently faced by taxpayers (Oveson, 2000), and people with less knowledge about tax law perceive the tax system less fair than knowledgeable people (Eriksen & Fallan, 1996). One significant cause of complexity is the desire on the part of policymakers to determine more accurately and equitably taxpayers' relative abilities to pay. Complexity may also result from attempts to prevent abuse and exploitation of the law, and it could be argued that tax complexity and equity should be positively related. Conversely, even complexity intended to determine taxpayers' abilities to pay more accurately and allocate the tax burden will impose additional compliance costs and administrative costs on taxpayers. In some cases these additional costs, the distribution of these costs, and the resulting inefficiencies may actually increase the welfare cost and inequity of the system. Complexity may also result in taxpayer frustration and increased perceptions of inequity independent of any net effect it may have on actual after-tax income distributions (Cuccia & Carnes, 2001). Carnes and Cuccia (1996) report that the negative relation between complexity and equity ratings of specific tax items weakened as the perceived justification for the complexity increased. Most research investigating the relation between tax equity perceptions and compliance is based, either explicitly or implicitly, on equity theory (Adams, 1965). Equity theory posits that people normatively expect a comparable rate of inputs and outcomes across all parties to an exchange (e.g., exchange equity between the taxpayer and the government and equity across taxpayers), and will be motivated to alter the distribution if a comparable rate is not perceived to exist. Carnes and Cuccia (1996) found that providing explicit justification mitigates the deleterious effect of tax complexity on tax equity judgements.

People try to avoid taxes mainly because they are guided by self-interest. At the core of most economic analyses of tax evasion is the assumption that people avoid tax payments when it is worthwhile to do so. If the perceived benefits of evasion outweigh the perceived costs, then, if it is possible, individuals will evade taxes. Economic standard theory thus suggests that policy variables such as penalty rate, detection probability, and tax rate are important variables. Psychological approaches stress the importance of values, attitudes, norms and morals, and fiscal consciousness. While economic theory suggests that people are outcome-maximizing or optimizing, psychology emphasizes the process that is involved rather than just outcomes (Cullis & Lewis, 1997). Would people be predominantly outcome-oriented, then virtually everybody should evade taxes given the actual punishment rates and the probability of detection (Smith & Kinsey, 1987).

Hessing and Elffers (1985) and Weigel, Hessing, and Elffers (1987) treat tax evasion as defective behaviour within a social dilemma. In social dilemmas, people are faced with a conflict between the pursuit of their own individual outcome and the pursuit of collective outcome. Non-compliance implies individual gain at some cost to others, while compliance may imply gain to others at some cost to oneself. Thus, the tax system presents people with a choice between co-operative behaviour and defective behaviour. This model has been explored in a number of studies and so far has stood up reasonably well. Elffers, Weigel, and Hessing (1987) found, for example, that measures of personal constraint such as fear of punishment, social controls, relevant tax attitudes, etc. did correlate with self-reported evasion but not with officially documented evasion. Conversely, there was a correlation of personal instigation measures such as dissatisfaction with the tax authorities, alienation, competitiveness, etc. with officially documented evasion but not self-reported evasion. Webley, Cole, and Eidjar (2001) tested the model of taxpaying behaviour, asking non-evaders, people who agreed that they might evade tax but did not report ever having done so, and self-reported evaders, about exchange relationship with the government, and other variables. The most important predictor of self-reported tax evasion was perceived opportunity to evade. The next most important was the perceived prevalence of evasion among friends and colleagues. Other determinants of tax compliance were attitudes to tax authorities, egoism, the perceived exchange relationship with government, attitudes to tax evasion, penalty if caught, and horizontal equity.

Empirical results on self-reported tax morality and tax evasion also indicate that tax compliance is influenced by gender. Spicer and Hero (1985) point out that men are less compliant than women, whereas the findings of other researchers suggest the opposite to be true (Friedland, Maital, & Rutenberg, 1978). There is also some evidence indicating that tax morality is likewise affected by attitudes toward the tax system, perceived justice of the tax system, and knowledge of the legal principles underlying tax law (Groenland & van Veldhoven, 1983; Kirchler, 1997; Vogel, 1974; Webley, Robben, Elffers, & Hessing, 1991).

Elffers and Hessing (1997), with reference to prospect theory (Kahneman & Tversky, 1979), advance the proposition that deliberate overwithholding of income taxes will further the tendency to comply. Moreover, it is demonstrated that offering the taxpayer a choice between full itemized deduction or a considerable, overall standard deduction will enhance compliance as well as considerably reduce the efforts needed by the tax authorities to prevent income tax evasion. Schmidt (2001) provides empirical support for such a proposition. Taxpayers in a balance-due prepayment position were more likely to agree with aggressive advice than taxpayers in a refund position. Deliberate overwithholding of income taxes enhances tax compliance (see also Schepanski & Shearer, 1995).

Kirchler and Maciejovsky (2001) also applied prospect theory to explain tax behaviour. It was hypothesized that tax morality is dependent on gain and loss situations and on the reference point used. Kahneman and Tversky's (1979) approach implicitly suggests that tax-related decisions are based on the expected asset position, whereas Schepanski and Shearer (1995) hold that the current asset position best describes the reference point. Kirchler and Maciejovsky (2001) assumed that individual habits affect which reference point is used (i.e., whether a person uses expected asset position or current asset position as a reference point in making tax-related decisions). Self-employed people, who have the option of choosing the cash receipts and disbursements method, were assumed to employ the current asset position in tax-reporting decisions. Therefore, it was predicted that unexpected payments should lead to low tax morality, whereas unexpected refunds should lead to high tax morality. Conversely, business entrepreneurs, who are obliged to use the more restrictive accrual method, think long term and strategically. Thus, the reference point they should employ in making tax-related decisions is their expected asset position. It was predicted and confirmed that expected payments lead to low tax morality, whereas expected refunds lead to high tax morality for this group of respondents.

With regard to tax compliance, tax practitioners play an important role, since most taxpayers rely on their advice. Tan (1999) reports that they assist the government to enforce tax law when it is unambiguous, but assist taxpayers to exploit tax law when it is ambiguous. Tax practitioners, however, assert that it is the taxpayers who insist on aggressive tax reporting. Tan (1999) found that taxpayers, mainly small business owners, agree with the advice, conservative or aggressive, given by their practitioner. It appears that the practitioners' advice is generally accepted as correct by their clients who are unfamiliar with tax law. Therefore, the literature suggesting taxpayers to be the instigators of aggressive reporting is not strongly supported. Rather, the majority appear to be cautious taxpayers, primarily interested in filing a correct tax return and avoiding serious tax penalties. In addition, the absence of a significant effect of probability of audit and severity of penalties on taxpayer's decisions indicates that tax decisions are not always based on the economic approach of 'utility maximization'. With regard to agreement with aggressive advice, Schmidt (2001) found that agreement increases if given by certified public accountants than by non-certified public accountants.

GOVERNMENT AND POLICY

'Economics is the study of how people and society end up choosing, with or without the use of money, to employ scarce productive resources ...' (Samuelson, 1976, p. 3). A central concern of economics is how scarce goods are allocated by the interaction of supply and demand in a market system. Kemp (1996, 1998a, 1998b) and Kemp and Bolle (1999) studied preferences for distributing goods by the market or government. If a sudden scarcity of a product develops, for unforeseen reasons and through no fault of the supplier or potential customers, should the product be distributed via the market or a system of regulation? Kemp (1996) presented respondents with scenarios where the shortage was brought about accidentally and only half as much of the commodity as was needed or desired was available. The shortages were of French champagne, heating fuel, sports fields, or a drug needed for treating a possibly fatal disease. The market system was not always regarded as the best way to distribute scarce goods. People's preferences for distribution by market or regulation were substantially affected by the nature of the scarcity. In particular, these preferences were strongly influenced by whether or not people's health was at stake, by the number of people affected by the scarcity, by the expected duration of the scarcity, by whether someone can profit substantially from the scarcity, and by whether the supplier or producer is a monopoly.

One relevant question relates to the availability of public goods, their value, and their use for selfish purposes. Yaniv (1997) investigated welfare fraud and welfare stigma and found that stigma constitutes a stronger deterrent to participation than the expected punishment for dishonest claiming. This result is in line with sociologists' and psychologists' contention that the threat of informal sanctions could have larger effects than legal sanctions. Many public goods have no explicit market price. When the value of public goods as well as environmental goods is estimated, frequently a hypothetical or contingent market is created and willingness to pay for them is assessed.

Contingent valuation requires that individuals are asked their willingness to pay or willingness to accept compensation for goods. This method is widely used but not without shortcomings (e.g., Chilton and Hutchinson, 2000; Knetsch, 1994; Morrison, 2000; Posavac, 1998; Ryan & San Miguel, 2000; Svedsäter, 2000).

Governments can introduce changes in tax and interest rates, and by such interventions control economic behaviour to a certain extent. Usually, reactions to such interventions are slow. East and Hogg (2000) put forward the proposition that the government should use advertising to enhance consumers' responsiveness to the marketplace. They argue that if consumers are prompted to be more alert to price and quality differences in the products and services on offer and if they are encouraged to express their complaints to suppliers and to search for alternative products, then competition in the industry will increase. Such increase in competition will ultimately increase the rate of economic growth and lead to positive outcomes, such as lower prices and improved quality.

Finally, the question arises as to how far the state, the market and the economy in general contribute to the satisfaction of needs and the improvement of life satisfaction. Economic growth is, after all, the motive force driving optimal use of resources for the satisfaction of needs and the consequent increase in satisfaction. However, Easterlin (2001) draws a picture in which the delusion of economic growth leads us to a treadmill in which all our efforts bring us no further than our starting point.

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REFERENCES

Abouchedid, K., & Nasser, R. (2001). Poverty attitudes and their determinants in Lebanon's plural society. *Journal of Economic Psychology*, **22**, 271–282.

Adams, J. (1965). Inequity in social exchange. In L. Berkowitz (ed.), *Advances in Experimental Social Psychology* (pp. 267–299). New York: Academic Press.

Albert, M., Güth, W., Kirchler, E., & Maciejovsky, B. (2002). Holistic experimentation versus decomposition: An ultimatum experiment. *Journal of Economic Behavior and Organization*, **48**, 445–453.

Anand, P. (2001). Procedural fairness in economic and social choice: Evidence from a survey of voters. *Journal of Economic Psychology*, **22**, 247–270.

Anderhub, V., Güth, W., Müller, W., & Strobel, M. (2000). An experimental analysis of intertemporal allocation behavior. *Experimental Economics*, **3**, 137–152.
Anderson, B. F., & Settle, J. W. (1996). The influence of portfolio characteristics and investment period on investment choice. *Journal of Economic Psychology*, **17**, 343–358.
Anderson, M. A., & Goldsmith, A. H. (1997). Mr. Keynes' theory of investment: Do forward looking expectations and weight really matter? *Journal of Economic Psychology*, **18**, 547–573.
Antonides, G. (1991). *Psychology in Economics and Business*. Dordrecht: Kluwer.
Antonides, G., Farago, K., Ranyard, R., & Tyszka, T. (1994). Perceptions of economic activities: A cross-country comparison. Paper given at the *IAREP/SABE Conference, Rotterdam, The Netherlands, 10–13 July*.
Aquino, C., Berti, A. E., & Consolati, G. (1996). La ristrutturazione della conoscenza in un sottodominio economico: La banca. *Giornale Italiano di Psicologia*, **23**, 63–84 [in Italian].
Ashworth, J., & Heyndels, B. (2000). A schema-theoretic approach to politicians' definitions of tax issues. *Journal of Economic Psychology*, **21**, 21–41.
Augier, M. (2001). Sublime Simon: The consistent vision of economic psychology's Nobel laureate. *Journal of Economic Psychology*, **22**, 307–334.
Aukutsionek, S. P., & Belianin, A. V. (2001). Quality of forecasts and business performance: A survey study of Russian managers. *Journal of Economic Psychology*, **22**, 661–692.
Bailey, J. R. (1997). Need for cognition and response mode in the active construction of an information domain. *Journal of Economic Psychology*, **18**, 69–85.
Berti, A. E., & Bombi, A. S. (1981). *Il Mondo Economico nel Bambino*. Florence: La Nuova Italia [in Italian].
Bethwaite, J., & Tompkinson, P. (1996). The ultimatum game and non-selfish utility functions. *Journal of Economic Psychology*, **17**, 259–271.
Bonetti, S. (1998). Experimental economics and deception. *Journal of Economic Psychology*, **19**, 377–395.
Bonn, M., Earle, D., Lea, S., & Webley, P. (1999). South African children's views of wealth, poverty, inequality and unemployment. *Journal of Economic Psychology*, **20**, 593–612.
Boone, C., de Brabander, B., & van Witteloostuijn, A. (1999). The impact of personality on behavior in five Prisoner's Dilemma games. *Journal of Economic Psychology*, **20**, 343–377.
Bosman, C. M., Pfann, G. A., Biddle, J. E., & Hamermesh, D. S. (1997). *Beauty Success and Businesses' Beauty Capital* (Working Paper Series No. 6083). Cambridge: National Bureau of Economic Research.
Brandouy, O. (2001). Laboratory incentive structure and control-test design in an experimental asset market. *Journal of Economic Psychology*, **22**, 1–26.
Brandstätter, E., & Brandstätter, H. (1996). What's money worth? Determinants of the subjective value of money. *Journal of Economic Psychology*, **17**, 443–464.
Brandstätter, H. (1997). Becoming an entrepreneur—a question of personality structure? *Journal of Economic Psychology*, **18**(2–3), 157–177.
Brandstätter, H., & Güth, W. (2000). A psychological approach to individual differences in intertemporal consumption patterns. *Journal of Economic Psychology*, **21**, 465–479.
Burlando, R. M. (2000). Values, ethics and economics. *World Futures*, **56**, 241–261.
Butler, A., & Highhouse, S. (2000). Deciding to sell: The effect of prior inaction and offer source. *Journal of Economic Psychology*, **21**, 223–232.

Cairns, J., & van der Pol, M. (2000). Valuing future private and social benefits: The discounted utility model versus hyperbolic discounting models. *Journal of Economic Psychology*, **21**, 191–205.
Callahan, C., & Elliott, C. S. (1996). Listening: A narrative approach to everyday understandings and behavior. *Journal of Economic Psychology*, **17**, 79–114.
Carnes, G., & Cuccia, A. (1996). An analysis of the effect of tax complexity and its perceived justification on equity judgments. *The Journal of the American Taxation Association*, **18**, 40–56.
Champlin, F. C., & Kopelman, R. E. (1991). Hinrichs revisited: Evaluations of income increases. *The Journal of Psychology*, **125**, 359–373.
Cherry, T. L. (2001). Mental accounting and other-regarding behavior: Evidence from the lab. *Journal of Economic Psychology*, **22**, 605–616.
Chilton, S. M., & Hutchinson, W. G. (1999). Do focus groups contribute anything to the contingent valuation process? *Journal of Economic Psychology*, **20**, 465–483.
Chilton, S. M., & Hutchinson, W. G. (2000). A note on the warm glow of giving and scope sensitivity in contingent valuation studies. *Journal of Economic Psychology*, **21**, 343–349.
Christopher, A. N., & Schlenker, B. R. (2000). The impact of perceived material wealth and perceiver personality on first impressions. *Journal of Economic Psychology*, **21**, 1–19.
Church, B. K., & Zhang, P. (1999). Bargaining behavior and payoff uncertainty: Experimental evidence. *Journal of Economic Psychology*, **20**, 407–429.
Clark, J. M. (1918). Economics and modern psychology. *The Journal of Political Economy*, **26**, 1–30.
Connor, R. A. (1996). More than risk reduction: The investment appeal of insurance. *Journal of Economic Psychology*, **17**, 39–54.
Cram, F., & Ng, S. H. (1994). Children's understanding of public ownership. *European Journal of Social Psychology*, **24**, 469–480.
Cuccia, A. D., & Carnes, G. A. (2001). A closer look at the relation between tax complexity and tax equity perceptions. *Journal of Economic Psychology*, **22**, 113–140.
Cullis, J. G., & Lewis, A. (1997). Why people pay taxes: From a conventional economic model to a model of social convention. *Journal of Economic Psychology*, **18**, 305–321.
Darity, W., & Goldsmith, A. H. (1993). Unemployment, social psychology, and unemployment hysteresis. *Journal of Post Keynesian Economics*, **16**, 55–72.
Davidsson, P., & Wiklund, J. (1997). Values, beliefs, and regional variations in new firm formation rates. *Journal of Economic Psychology*, **18**, 179–199.
Davis, D. D., & Holt, C. A. (1993). *Experimental Economics*. Princeton, NJ: Princeton University Press.
De Ruyter, K., & Wetzels, M. (2000). With a little help from my fans—Extending models of pro-social behaviour to explain supporters' intentions to buy soccer club shares. *Journal of Economic Psychology*, **21**, 387–409.
Dittmar, H., & Drury, J. (2000). Self image—is it in the bag? A qualitative comparison between 'ordinary' and 'excessive' consumers. *Journal of Economic Psychology*, **21**, 109–142.
Donkers, B., & van Soest, A. (1999). Subjective measures of household preferences and financial decisions. *Journal of Economic Psychology*, **20**, 613–642.
Downs, A. (1957). *An Economic Theory of Democracy*. New York: Harper & Row.
Druckman, J. N. (2001). Evaluating framing effects. *Journal of Economic Psychology*, **22**, 91–101.

Earl, P. E. (ed.) (2001). *The Legacy of Herbert Simon in Economic Analysis*. Cheltenham, UK: Edward Elgar.
Earl, P. E., & Kemp, S. (eds) (1999). *The Elgar Companion to Consumer Research and Economic Psychology*. Cheltenham, UK: Edward Elgar.
East, R., & Hogg, A. (2000). Advertising for economic change. *Journal of Economic Psychology*, **21**, 577–590.
Easterlin, R. A. (ed.) (2001). *Happiness in Economics*. Cheltenham, UK: Edward Elgar.
Elffers, H., & Hessing, D. J. (1997). Influencing the prospects of tax evasion. *Journal of Economic Psychology*, **18**, 289–304.
Elffers, H. Weigel, R. H., & Hessing, D. J. (1987). The consequences of different strategies of measuring tax evasion behavior. *Journal of Economic Psychology*, **8**, 311–337.
Elmslie, B., & Sedo, S. (1996). Discrimination, social psychology, and hysteresis in labor markets. *Journal of Economic Psychology*, **17**, 465–478.
El-Sehity, T., Haumer, H., Helmenstein, C., Kirchler, E., & Maciejovsky, B. (Forthcoming). Hindsight bias and individual risk attitude within the context of experimental asset markets.
Eriksen, K., & Fallan, L. (1996). Tax knowledge and attitudes towards taxation: A report on a quasi-experiment. *Journal of Economic Psychology*, **17**, 387–402.
Etzioni, A. (1988). *The Moral Dimension. Toward a New Economics*. New York: Free Press.
Falk, A., Gächter, S., & Kovács, J. (1999). Intrinsic motivation and extrinsic incentives in a repeated game with incomplete contracts. *Journal of Economic Psychology*, **20**, 251–284.
Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics*, **49**, 283–306.
Fehr, E., & Gächter, S. (1998). Reciprocity and economics: The economic implications of Homo reciprocans. *European Economic Review*, **42**, 845–859.
Fehr, E., Gächter, S., & Kirchsteiger, G. (1997). Reciprocity as a contract enforcement device: Experimental evidence. *Econometrica*, **65**, 833–860.
Fehr, E., Kirchler, E., Weichbold, A., & Gächter, S. (1998). When social norms overpower competition: Gift exchange in experimental labor markets. *Journal of Labor Economics*, **16**, 324–351.
Fehr, E., & Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics*, **114**, 817–868.
Ferrari, L., & Romano, D. (1999). *Mente e Denaro. Introduzione alla Psicologia Economica* [Mind and Money. Introduction to Economic Psychology]. Milan: R. Cortina [in Italian].
Fershtman, C. (1996). On the value of incumbency: Managerial reference points and loss aversion. *Journal of Economic Psychology*, **17**, 245–258.
Frank, H., & Korunka, C. (1996). Zum Informations- und Entscheidungsverhalten von Unternehmensgründern. Der Zusammenhang von 'Handlungskontrolle' und Gründungserfolg. *Zeitschrift für Betriebswirtschaft*, **66**, 947–963 [in German].
Frank, R. H. (1985). *Choosing the Right Pond: Human Behavior and the Quest for Status*. New York: Oxford University Press.
Frey, B. S. (1990). Entscheidungsanomalien: Die Sicht der Ökonomie. *Psychologische Rundschau*, **41**, 67–83 [in German].
Friedland, N., Maital, S., & Rutenberg, A. (1978). A simulation study of income tax evasion. *Journal of Public Economics*, **10**, 107–116.
Frijters, P. (2000). Do individuals try to maximize general satisfaction? *Journal of Economic Psychology*, **21**, 281–304.

Furnham, A. (1997). The relationship between work and economic values. *Journal of Economic Psychology*, **18**, 1–14.
Furnham, A. (1999). The saving and spending habits of young people. *Journal of Economic Psychology*, **20**, 677–697.
Furnham, A. (2001). Parental attitudes to pocket money/allowances for children. *Journal of Economic Psychology*, **22**, 397–422.
Furnham, A., & Lewis, A. (1986). *Economic Mind. The Social Psychology of Economic Behaviour*. Brighton, UK: Wheatsheaf Books.
Gerke, W., Arneth, S., & Syha, C. (2000). The impact of the order book privilege on traders' behavior and the market process: An experimental study. *Journal of Economic Psychology*, **21**, 167–189.
Gigerenzer, G., Todd, P. M., & The ABC Research Group (1999). *Simple Heuristics that Make Us Smart*. New York: Oxford University Press.
Gneezy, U., Güth, W., & Verboven, F. (2000). Presents or investments? An experimental analysis. *Journal of Economic Psychology*, **21**, 481–493.
Goldsmith, A. H., Veum, J. R., & Darity, W. Jr (1996). The impact of labor force history on self-esteem and its component parts, anxiety, alienation and depression. *Journal of Economic Psychology*, **17**, 183–220.
Goldsmith, A. H., Veum, J. R., & Darity, W. Jr (2000). Working hard for the money? Efficiency wages and worker effort. *Journal of Economic Psychology*, **21**, 351–385.
Gravelle, H., & Rees, R. (1981). *Microeconomics*. London: Longman.
Groenland, E. A. G., Kuylen, A. A. A., & Bloem, J. G. (1996). The dynamic process tracing approach: Towards the development of a new methodology for the analysis of complex consumer behaviours. *Journal of Economic Psychology*, **17**, 809–826.
Groenland, E. A. G., & van Veldhoven, G. M. (1983). Tax evasion behavior: A psychological framework. *Journal of Economic Psychology*, **3**, 129–144.
Groot, W., & van den Brink, H. M. (1999). The price of stress. *Journal of Economic Psychology*, **20**, 83–103.
Gunnarsson, J., & Wahlund, R. (1995). *Hushallens Finansiella Strategier*. Stockholm: The Economic Research Institute at the Stockholm School of Economics [in Swedish].
Gunnarsson, J., & Wahlund, R. (1997). Household financial strategies in Sweden: An exploratory study. *Journal of Economic Psychology*, **18**, 201–233.
Güth, W. (2000). Boundedly rational decision emergence—a general perspective and some selective illustrations. *Journal of Economic Psychology*, **21**, 433–458.
Güth, W., Krahnen, J. P., & Rieck, C. (1997). Financial markets with asymmetric information: A pilot study focusing on insider advantages. *Journal of Economic Psychology*, **18**, 235–257.
Güth, W., Ockenfels, P., & Wendel, M. (1997). Cooperation based on trust. An experimental investigation. *Journal of Economic Psychology*, **18**, 15–43.
Güth, W., Schmittberger, R., & Schwarzer, B. (1982). An experimental study of ultimatum bargaining. *Journal of Economic Behavior and Organization*, **3**, 367–388.
Hayhoe, C. R., Leach, L., & Turner, P. R. (1999). Discriminating the number of credit cards held by college students using credit and money attitudes. *Journal of Economic Psychology*, **20**, 643–656.
Hessing, D. J., & Elffers, H. (1985). Economic man or social man? A social orientation model for individual behaviour in social dilemmas. In H. Brandstätter, & E. Kirchler (eds), *Economic Psychology* (pp. 195–203). Linz, Austria: Trauner.
Hey, J. D. (1991). *Experiments in Economics*. Oxford: Basil Blackwell.

Hinrichs, J. R. (1969). Correlates of employee evaluations of pay increases. *Journal of Applied Psychology*, **53**, 481–489.

Hoorens, V., Remmers, N., & van de Riet, K. (1999). Time is an amazingly variable amount of money: Endowment and ownership effects in the subjective value of working time. *Journal of Economic Psychology*, **20**, 383–405.

Huck, S. (1999). Responder behavior in ultimatum offer games with incomplete information. *Journal of Economic Psychology*, **20**, 183–206.

Huck, S., & Oechssler, J. (2000). Informational cascades in the laboratory: Do they occur for the right reasons? *Journal of Economic Psychology*, **21**, 661–671.

Huck, S., & Weizsäcker, G. (1999). Risk, complexity, and deviations from expected-value maximization: Results of a lottery choice experiment. *Journal of Economic Psychology*, **20**, 699–715.

Hunt, M. (1996). The individual, society, or both? A comparison of Black, Latino and White beliefs about the causes of poverty. *Social Forces*, **75**, 293–322.

Jain, A. K., & Joy, A. (1997). Money matters: An exploratory study of the socio-cultural context of consumption, saving, and investment patterns. *Journal of Economic Psychology*, **18**, 649–675.

Janssen, M. A., & Jager, W. (2001). Fashions, habits and changing preferences: Simulation of psychological factors affecting market dynamics. *Journal of Economic Psychology*, **22**, 745–772.

Jungermann, H., Pfister, H.-R., & Fischer, K. (1998). *Die Psychologie der Entscheidung*. Heidelberg, Germany: Spektrum [in German].

Kahneman, D., Knetsch, J. L., & Thaler, R. (1986). Fairness as a constraint on profit seeking: Entitlements in the market. *American Economic Review*, **76**, 728–741.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, **47**, 263–291.

Kasser, T., & Grow Kasser, V. (2001). The dreams of people high and low in materialism. *Journal of Economic Psychology*, **22**, 693–719.

Katona, G. (1951). *Psychological Analysis of Economic Behavior*. New York: Elsevier.

Katona, G. (1975) *Psychological Economics*. New York: Elsevier.

Kemp, S. (1996). Preferences for distributing goods in times of shortage. *Journal of Economic Psychology*, **17**, 615–628.

Kemp, S. (1998a). Rating the values of government and market supplied goods. *Journal of Economic Psychology*, **19**, 447–461.

Kemp, S. (1998b). Perceiving luxury and necessity. *Journal of Economic Psychology*, **19**, 591–606.

Kemp, S., & Bolle, F. (1999). Preferences in distributing scarce goods. *Journal of Economic Psychology*, **20**, 105–120.

Kemp, S., & Willetts, K. (1996). Remembering the price of wool. *Journal of Economic Psychology*, **17**, 115–126.

Khalil, E. L. (1996). Respect, admiration, aggrandizement: Adam Smith as economic psychologist. *Journal of Economic Psychology*, **17**, 555–578.

Kirchler, E. (1997). Balance between giving and receiving: Tax morality and satisfaction with fiscal policy as they relate to the perceived just distribution of public resources. *Reitaku International Journal of Economic Studies*, **5**, 59–70.

Kirchler, E. (1998). Differential representations of taxes: Analysis of free associations and judgments of five employment groups. *Journal of Socio Economics*, **27**, 117-131.

Kirchler, E. (1999). *Wirtschaftspsychologie*. Göttingen, Germany: Hogrefe [in German].

Kirchler, E., Fehr, E., & Evans, R. (1996). Social exchange in the labor market: Reciprocity and trust versus egoistic money maximization. *Journal of Economic Psychology*, **17**, 313–342.

Kirchler, E., & Maciejovsky, B. (2001). Tax compliance within the context of gain and loss situations, expected and current asset position, and profession. *Journal of Economic Psychology*, **22**, 173–194.

Kirchler, E., & Maciejovsky, B. (2002). Simultaneous over- and underconfidence: Evidence from experimental asset markets. *Journal of Risk and Uncertainty*, **25**, 65–85.

Kirchler, E., Rodler, C., Hölzl, E., & Meier, K. (2001). *Conflict and Decision Making in Close Relationships*. Hove, UK: Psychology Press.

Knetsch, J. L. (1994). Environmental valuation: Some problems of wrong questions and misleading answers. *Environmental Values*, **3**, 351–368.

Kokkinaki, F. (1998). Attitudes towards European Monetary Union in Greece: Antecedents, strength and consequences. *Journal of Economic Psychology*, **19**, 775–796.

Korunka, C., Frank, H., & Becker, P. (1993). Persönlichkeitseigenschaften von Unternehmensgründern. Erfolgsfaktor oder vernachlässigbare Restgröße in der Theorie der Unternehmensgründung. *Internationales Gewerbearchiv Zeitschrift für Klein- und Mittelunternehmen*, **41**, 169–188 [in German].

Krahnen, J. P., Rieck, C., & Theissen, E. (1997). Inferring risk attitudes from certainty equivalents: Some lessons from an experimental study. *Journal of Economic Psychology*, **18**, 469–486.

Kristensen, H., & Gärling, T. (1997). Determinants of buyers' aspiration and reservation price. *Journal of Economic Psychology*, **18**, 487–503.

Kühberger, A. (1995). The framing of decisions: A new look at old problems. *Organizational Behavior and Human Decision Processes*, **62**, 230–240.

Kyle, D. M., & Mahler, H. I. M. (1996). The effect of hair color and cosmetic use on perceptions of a female's ability. *Psychology of Women Quarterly*, **20**, 447–455.

Laibson, D. (1997). Golden eggs and hyperbolic discounting. *Quarterly Journal of Economics*, **62**, 443–477.

Lea, S. E. G., Tarpy, R. M., & Webley, P. (1987). *The Individual in the Economy: A Survey of Economic Psychology*. Cambridge: Cambridge University Press.

Li, S. (1996). An additional violation of transitivity and independence between alternatives. *Journal of Economic Psychology*, **17**, 645–650.

Li, S. (1998). Can the conditions governing the framing effect be determined? *Journal of Economic Psychology*, **19**, 133–153.

Lim, V. K. G., & Teo, T. S. H. (1997). Sex, money and financial hardship: An empirical study of attitudes towards money among undergraduates in Singapore. *Journal of Economic Psychology*, **18**, 369–386.

Loewenstein, G., & Prelec, D. (1992). Anomalies in intertemporal choice: Evidence and an interpretation. *Quarterly Journal of Economics*, **107**, 573–597.

Loomes, G., & Sugden, R. (1982). Regret theory: An alternative theory of rational choice under uncertainty. *Economic Journal*, **92**, 805–824.

Luna-Arocas, R., Guzmán, G., Quintanilla, I., & Farhangmehr, M. (2001). The euro and European identity: The Spanish and Portuguese case. *Journal of Economic Psychology*, **22**, 441–460.

Lundberg, C. G. (2000). Made sense and remembered sense: Sensemaking through abduction. *Journal of Economic Psychology*, **21**, 691–709.

Lunt, P. (1996). Discourses of savings. *Journal of Economic Psychology*, **17**, 677–690.

Mackenzie, C. (1997). Where are the motives? A problem with evidence in the work of Richard Thaler. *Journal of Economic Psychology*, **18**, 123–135.

Mador, G., Sonsino, D., & Benzion, U. (2000). On complexity and lotteries' evaluation—three experimental observations. *Journal of Economic Psychology*, **21**, 625–637.

Meier, K., & Kirchler, E. (1998). Social representations of the euro in Austria. *Journal of Economic Psychology*, **19**, 755–774.

Meier, K., Kirchler, E., & Hubert, A.-C. (1999). Savings and investment decisions within private households: Spouses' dominance in decisions on various forms of investment. *Journal of Economic Psychology*, **20**, 499–519.

Mellers, B. A., Schwartz, A., & Cooke, A. D. J. (1998). Judgment and decision making. *Annual Review of Psychology*, **49**, 447–477.

Mitchell, W. C. (1914). Human behavior and economics: A survey of recent literature. *The Quarterly Journal of Economics*, **29**, 1–47.

Mitropoulos, A. (2001). Learning under minimal information: An experiment on mutual fate control. *Journal of Economic Psychology*, **22**, 523–558.

Morrison, G. C. (2000). WTP and WTA in repeated trial experiments: Learning or leading? *Journal of Economic Psychology*, **21**, 57–72.

Müller, W. (2001). Strategies, heuristics, and the relevance of risk-aversion in a dynamic decision problem. *Journal of Economic Psychology*, **22**, 493–522.

Müller-Peters, A. (1998). The significance of national pride and national identity to the attitude toward the single European currency: A Europe-wide comparison. *Journal of Economic Psychology*, **19**, 701–719.

Münsterberg, H. (1912). *Psychologie und Wirtschaftsleben*. Ein Beitrag zur angewandten Experimentalpsychologie. Leipzig, Germany: Barth [in German].

Murnighan, J. K., & Saxon, M. S. (1998). Ultimatum bargaining by children and adults. *Journal of Economic Psychology*, **19**, 415–445.

Ouwersloot, H., Nijkamp, P., & Rietveld, P. (1998). Errors in probability updating behaviour: Measurement and impact analysis. *Journal of Economic Psychology*, **19**, 535–563.

Overton, A. A., & MacFadyen, A. J. (1998). Time discounting and the estimation of loan duration. *Journal of Economic Psychology*, **19**, 607–618.

Oveson, W. V. (2000). *National Taxpayer Advocate's Annual Report to Congress*. Washington, DC: Office of Taxpayer Advocate.

Pålsson, A.-M. (1996). Does the degree of relative risk aversion vary with household characteristics? *Journal of Economic Psychology*, **17**, 771–788.

Pepermans, R., Burgoyne, C. B., & Müller-Peters, A. (1998). Editorial. *Journal of Economic Psychology*, **19**, 657–661.

Pepermans, R., & Verleye, G. (1998). A unified Europe? How euro attitudes relate to psychological differences between countries. *Journal of Economic Psychology*, **19**, 681–699.

Pepermans, R., Verleye, G., & Van Cappellen, S. (1996). 'Wallbanking', innovativeness and computer attitudes: 25–40-year-old ATM-users on the spot. *Journal of Economic Psychology*, **17**, 731–748.

Pingle, M. (1997). Submitting to authority: Its effect on decision-making. *Journal of Economic Psychology*, **18**, 45–68.

Plug, E. J. S. (2001). Season of birth, schooling and earnings. *Journal of Economic Psychology*, **22**, 641–660.

Plug, E. J. S., & van Praag, B. M. S. (1998). Similarity in response behavior between household members: An application to income evaluation. *Journal of Economic Psychology*, **19**, 497–513.

Posavac, S. S. (1998). Strategic overbidding in contingent valuation: Stated economic value of public goods varies according to consumers expectations of funding source. *Journal of Economic Psychology*, **19**, 205–214.

Powell, M., & Ansic, D. (1997). Gender differences in risk behaviour in financial decision-making: An experimental analysis. *Journal of Economic Psychology*, **18**, 605–628.

Rambo, W. W., & Pinto, J. N. (1989). Employees' perception of pay increases. *Journal of Occupational Psychology*, **62**, 135–145.

Rodgers, W. (1999). The influence of conflicting information on novices and loan officers' actions. *Journal of Economic Psychology*, **20**, 123–145.

Routh, D. A., & Burgoyne, C. B. (1998). Being in two minds about a single currency: A UK perspective on the euro. *Journal of Economic Psychology*, **19**, 741–754.

Rumiati, R., & Lotto, L. (1996). Varieties of money. Experts' and non-experts' typicality judgments. *Journal of Economic Psychology*, **17**, 403–414.

Ryan, M., & San Miguel, F. (2000). Testing for consistency in willingness to pay experiments. *Journal of Economic Psychology*, **21**, 305–317.

Sacco, P. L. (1996). Subjective metaphysics and learning from experience: The causal psychology of rational choice. *Journal of Economic Psychology*, **17**, 221–244.

Samuelson, P. A. (1976). *Economics*. New York: McGraw-Hill.

Scharlemann, J. P. W., Eckel, C. C., Kacelnik, A., & Wilson, R. K. (2001). The value of a smile: Game theory with a human face. *Journal of Economic Psychology*, **22**, 617–640.

Schaubroeck, J. (1996). Pay status hierarchy and organizational attachment. *Journal of Economic Psychology*, **17**, 579–590.

Schepanski, A., & Shearer, T. (1995). A prospect theory account of the income tax withholding phenomenon. *Organizational Behavior and Human Decision Making Processes*, **63**, 174–186.

Schmidt, D. R. (2001). The prospects of taxpayer agreement with aggressive tax advice. *Journal of Economic Psychology*, **22**, 157–172.

Schram, A., & Sonnemans, J. (1996). Why people vote: Experimental evidence. *Journal of Economic Psychology*, **17**, 417–442.

Schram, A., & van Winden, F. A. A. M. (1991). Why people vote: Free riding and the production and consumption of social pressure. *Journal of Economic Psychology*, **12**, 575–620.

Schuldner, K. (2001). Geschichte und Inhalte der Ökonomischen Psychologie. Unpublished thesis, University of Vienna [in German].

Schwer, R. K., & Daneshvary, R. (2000). Keeping up one's appearance: Its importance and the choice of type of hair-grooming establishment. *Journal of Economic Psychology*, **21**, 207–222.

Seligman, D. A., & Schwartz, B. (1997). Domain specificity of fairness judgments in economic transactions. *Journal of Economic Psychology*, **18**, 579–604.

Sen, A. (1993). Markets and freedoms. *Oxford Economic Papers*, **45**, 519–541.

Shavit, T., Sonsino, D., & Benzion, U. (2001). A comparative study of lotteries—evaluation in class and on the Web. *Journal of Economic Psychology*, **22**, 483–492.

Shefrin, H. (ed.) (2001). *Behavioral Finance*. (Vols 1–3). Cheltenham, UK: Edward Elgar.

Simon, H. (1957). *Models of Man*. New York: John Wiley & Sons.

Simon, H. (1982). *Models of Bounded Rationality*. Cambridge, MA: MIT Press.

Singh, L. B., Singh, A. K., & Rani, A. (1996). Level of self-concepts in educated unemployed young men in India: An empirical analysis. *Journal of Economic Psychology*, **17**, 629–644.

Smith, A. (1776). *An Enquiry into the Nature and Causes of the Wealth of Nations*. London: Bell.

Smith, K. W., & Kinsey, K. A. (1987). Understanding tax-paying behavior: A conceptual framework with implications for research. *Law and Society Review*, **21**, 639–663.

Smith, V. L. (1976). Experimental economics: Induced value theory. *American Economic Review*, **66**, 274–277.

Snelders, H. M. J., Hussein, G., Lea, S. E. G., & Webley, P. (1992). The polymorphous concept of money. *Journal of Economic Psychology*, **13**, 71–92.

Sonnegård, J. (1996). Determination of first movers in sequential bargaining games: An experimental study. *Journal of Economic Psychology*, **17**, 359–386.

Sonnemans, J. (2000). Decisions and strategies in a sequential search experiment. *Journal of Economic Psychology*, **21**, 91–102.

Spicer, M. W., & Hero, R. E. (1985). Tax evasion and heuristics: A research note. *Journal of Public Economics*, **26**, 263–267.

Stroeker, N. E., & Antonides, G. (1997). The process of reaching an agreement in second-hand markets for consumer durables. *Journal of Economic Psychology*, **18**, 341–367.

Strümpel, B., & Katona, G. (1983). Psychologie gesamtwirtschaftlicher Prozesse. In M. Irle, & W. Bussmann (eds), *Enzyklopädie der Psychologie. Marktpsychologie als Sozialwissenschaft* (pp. 225–281). Göttingen, Germany: Hogrefe [in German].

Suleiman, R. (1996). Expectations and fairness in a modified Ultimatum game. *Journal of Economic Psychology*, **17**, 531–554.

Supphellen, M., & Nelson, M. R. (2001). Developing, exploring, and validating a typology of private philanthropic decision making. *Journal of Economic Psychology*, **22**, 573–604.

Svedsäter, H. (2000). Contingent valuation of global environmental resources: Test of perfect and regular embedding. *Journal of Economic Psychology*, **21**, 605–623.

Swedberg, R. (1991). Major traditions of economics sociology. *Annual Review of Sociology*, **17**, 251–276.

Tan, L. M. (1999). Taxpayers' preference for type of advice from tax practitioner: A preliminary examination. *Journal of Economic Psychology*, **20**, 431–447.

Tang, T. L.-P. (1996). Pay differentials as a function of rater's sex, money ethic, and job incumbent's sex: A test of the Matthew Effect. *Journal of Economic Psychology*, **17**, 127–144.

Tarde, G. (1902). *La Psychologie Économique*. Paris: Alcan [in French].

Thaler, R. (1981). Some empirical evidence on dynamic inconsistency. *Economic Letters*, **8**, 201–207.

Thaler, R. (1992). *The Winner's Curse*. Princeton, NJ: Princeton University Press.

Thaler, R. (1999). The end of behavioral finance. *Financial Analysts Journal*, **55**, 12–19.

Theodoulou, S. (1996). Construing economic and political reality. *Journal of Economic Psychology*, **17**, 499–516.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. Science, **211**, 543–458.

Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, **5**, 297–323.

Tykocinski, O. E., Pittman, T. S., & Tuttle, E. E. (1995). Inaction inertia: Foregoing future benefits as a result of an initial failure to act. *Journal of Personality and Social Psychology*, **68**, 793–803.

Tyszka, T. (1994). Cognitive representations of economics. Paper given at the *IAREP/SABE Conference, Rotterdam, The Netherlands, 10-13 July*.

Tyszka, T., & Sokolowska, J. (1992). Perception and judgments of the economic system. *Journal of Economic Psychology*, **13**, 421–448.

Unser, M. (2000). Lower partial moments as measures of perceived risk: An experimental study. *Journal of Economic Psychology*, **21**, 253–280.

Van der Heijden, E. C. M., Nelissen, J. H. M., Potters, J. J. M., & Verbon, H. A. A. (1998). The poverty game and the pension game: The role of reciprocity. *Journal of Economic Psychology*, **19**, 5–41.

Van Dijk E., & van Knippenberg, D. (1996). Buying and selling exchange goods: Loss aversion and the endowment effect. *Journal of Economic Psychology*, **17**, 517–524.

Van Dijk, E., & van Knippenberg, D. (1998). Trading wine: On the endowment effect, loss aversion, and the comparability of consumer goods. *Journal of Economic Psychology*, **19**, 485–495.

Van Everdingen, Y. M., & van Raaij, W. F. (1998). The Dutch people and the euro: A structural equations analysis relating national identity and economic expectations to attitude towards the euro. *Journal of Economic Psychology*, **19**, 721–740.

Van Raaij, W. F. (1998). The life and work of Amos Tversky. *Journal of Economic Psychology*, **19**, 515–527.

Van Raaij, W. F., van Veldhoven, G. M., & Wärneryd, K.-E. (eds) (1988) *Handbook of Economic Psychology*. Dordrecht, The Netherlands: Kluwer.

Van Veldhoven, G. M. (1988). Dynamic aspects of economic behavior: Some determinants. In W. F. van Raaij, G. M. van Veldhoven, & K. E. Wärneryd (eds), *Handbook of Economic Psychology* (pp. 52–73). Dordrecht, The Netherlands: Kluwer.

Veblen, T. (1899). *The Theory of the Leisure Class*. New York: Macmillan.

Viaud, J., & Roland-Lévy, C. (2000). A positional and representational analysis of consumption: Households when facing debt and credit. *Journal of Economic Psychology*, **21**, 411–432.

Vogel, J. (1974). Taxation and public opinion in Sweden: An interpretation of recent survey data. *National Tax Journal*, **27**, 499–513.

von Rosenstiel, L. & Ewald, G. (1979). *Marktpsychologie* (Vols 1 and 2). Stuttgart, Germany: Kohlhammer [in German].

Wahlund, R., & Gunnarsson, J. (1996). Mental discounting and financial strategies. *Journal of Economic Psychology*, **17**, 709–730.

Wakely, T. M. (1997). The output decision of the firm—A behavioural algorithm. *Journal of Economic Psychology*, **18**, 111–121.

Walker, C. M. (1996). Financial management, coping and debt in households under financial strain. *Journal of Economic Psychology*, **17**, 789–808.

Wang, X. T. (1996). Domain-specific rationality in human choices: Violation of utility axioms and social contexts. *Cognition*, **60**, 31–63.

Wärneryd, K.-E. (1988). The psychology of innovative entrepreneurship. In W. F. van Raaij, G. M. van Veldhoven, & K.-E. Wärneryd (eds), *Handbook of Economic Psychology* (pp. 404–447). Dordrecht, The Netherlands: Kluwer.

Wärneryd, K.-E. (1993). Psychology + economics = economic psychology? Unpublished paper, Stockholm School of Economics.

Wärneryd, K.-E. (1996). Risk attitudes and risky behavior. *Journal of Economic Psychology*, **17**, 749–770.

Wärneryd, K.-E. (1999). *The Psychology of Saving: A Study on Economic Psychology*. Cheltenham, UK: Edward Elgar.

Wärneryd, K.-E. (2001). *Stock-Market Psychology. How People Value and Trade Stocks*. Cheltenham, UK: Edward Elgar.

Wärneryd, K.-E., & Westlund, K. (1992). Ethics and economic affairs in the world of finance. *Journal of Economic Psychology*, **14**, 523–539.

Waters, L. E., & Moore, K. A. (2001). Coping with economic deprivation during unemployment. *Journal of Economic Psychology*, **22**, 461–482.
Wesley, P., Burgoyne, C. B., Lea, S. E. G., & Young, B. M. (2001). *The Economic Psychology of Everyday Life*. Hove, UK: Psychology Press.
Webley, P., Cole, M., & Eidjar, O.-P. (2001). The prediction of self-reported and hypothetical tax-evasion: Evidence from England, France and Norway. *Journal of Economic Psychology*, **22**, 141–156.
Webley, P., Lewis, A., & Mackenzie, C. (2001). Commitment among ethical investors: An experimental approach. *Journal of Economic Psychology*, **22**, 27–42.
Webley, P., Robben, H., Elffers, H., & Hessing, D. (1991). *Tax Evasion. An Experimental Approach*. Cambridge: Cambridge University Press.
Weigel, R. H., Hessing, D. J., & Elffers, H. (1987). Tax evasion research: A critical appraisal and a theoretical model. *Journal of Economic Psychology*, **8**, 215–235.
Williamson, M. R., & Wearing, A. J. (1996). Lay people's cognitive models of the economy. *Journal of Economic Psychology*, **17**, 3–38.
Winnett, A., & Lewis, A. (2000). 'You'd have to be green to invest in this': Popular economic models, financial journalism, and ethical investment. *Journal of Economic Psychology*, **21**, 319–339.
Wiswede, G. (2000). *Einführung in die Wirtschaftspsychologie*. Munich, Germany: UTB [in German].
Yaniv, G. (1997). Welfare fraud and welfare stigma. *Journal of Economic Psychology*, **18**, 435–451.
Zeelenberg, M., & Van Dijk, E. (1997). A reverse sunk cost effect in risky decision making: Sometimes we have too much invested to gamble. *Journal of Economic Psychology*, **18**, 677–691.
Zwick, R., Rapoport, A., & Weg, E. (2000). Invariance failure under subgame perfectness in sequential bargaining. *Journal of Economic Psychology*, **21**, 517–544.

Chapter 3

SLEEPINESS IN THE WORKPLACE: CAUSES, CONSEQUENCES, AND COUNTERMEASURES

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Feeling sleepy during the workday as a result of lacking sufficient sleep has become an epidemic problem in the working population according to annual polls conducted by the National Sleep Foundation (NSF) from 1998 to 2002. The most recent poll (NSF, 2002) showed that 39% of respondents reported getting less than seven hours of sleep on weeknights, which is one hour less than recommended by sleep experts. The poll's findings further suggested a negative relationship between sleep hours and daytime sleepiness, with 37% of respondents reporting daytime sleepiness and 6% the use of medications to stay awake.

It is our contention that sleepiness in the workplace has been a neglected occupational health topic in Industrial and Organizational (I/O) Psychology. The potential consequences pertaining to sleepiness in the workplace have profound practical, health, and legal implications for organizations. According to the 2002 poll, described above, over 90% of respondents believed that their work performance and safety were influenced by their sleep debt. In addition, over 60% of respondents believed that, as a result of sleep debt, they had difficulty reading business documents, taking on additional tasks, making thought-out decisions, or recalling things they had just heard. The series of surveys also revealed that the greater the number of hours worked, the less sleep obtained, the more negative emotions (e.g., anger, anxiety) experienced.

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