

Readings for College English 大学用书

SELECTED PAPERS ON
Contemporary
SCIENCE & TECHNOLOGY II
英语现代科技文献精读本

华中一 陆 栋 卢义民 编著

复旦大学出版社

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江苏工业学院图书馆
藏书章

复旦大学出版社

图书在版编目(CIP)数据

英语现代科技文献精读本Ⅱ/华中一,陆栋,卢义民编著.
—上海:复旦大学出版社,2008.4
ISBN 978-7-309-05836-9

I. 英… II. ①华…②陆…③卢… III. 科学技术-英语-高等学校-教材
IV. H31

中国版本图书馆 CIP 数据核字(2007)第 182904 号

英语现代科技文献精读本Ⅱ

华中一 陆 栋 卢义民 编著

出版发行 复旦大学出版社 上海市国权路 579 号 邮编 200433
86-21-65642857(门市零售)
86-21-65100562(团体订购) 86-21-65109143(外埠邮购)
fupnet@fudanpress.com http://www.fudanpress.com

责任编辑 梁 玲

总 编 辑 高若海

出 品 人 贺圣遂

印 刷 浙江省临安市曙光印务有限公司

开 本 787×960 1/16

印 张 27.75

字 数 533 千

版 次 2008 年 4 月第一版第一次印刷

印 数 1—3 100

书 号 ISBN 978-7-309-05836-9/H·1162

定 价 42.00 元

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Text 1

The Pleasures and Pains of Information

George Loewenstein
(*Science* 312, 704, 2006)

Information serves not only as an input into *decision-making*¹ but is a source of pleasure and pain *in its own right*². This has diverse consequences for human decision-making.

In 1961, economist and *Nobel Laureate*³ George Stigler⁴ [1] initiated the “*economics of information*”⁵ when he relaxed an assumption that had dominated economics until that point. Rather than assume that people are fully knowledgeable of relevant information when it comes to making a decision, he allowed for the possibility that people might lack information and be motivated to acquire it. As Stigler noted when he accepted the 1982 Nobel Prize, “The proposal to study the economics of information was promptly and widely accepted, and *without even a respectable minimum of controversy*”⁶. Within a decade and a half, the literature had become so extensive and the theorists working in the field so prominent, that the subject was given *a separate classification*⁷ in the *Index of Economic Articles*.⁸ Stigler acknowledged that “The absence of controversy certainly was no tribute to the definitiveness of my exposition.” Rather, “All I had done was to open a door to a room that contained many fascinating and important problems” [2].

Relaxing the assumption of *perfect information*⁹ did, indeed, open new doors for economists. Yet the economics of information that emerged from Stigler’s *seminal contribution*¹⁰ embraced *its own set of*¹¹ strong assumptions about how people deal with the information they acquire. Although these assumptions have proven their value, forming the basis for tractable models that generate testable, often valid, predictions of decision-making and *market outcomes*¹², several of the

信息的欢乐与痛苦

Notes

1. **decision-making** *a.* 决策的 *n.* 决策
decision-maker 决策者
2. **in its own right** 凭自身的名义（资格或权利）
3. **Nobel Laureate** 诺贝尔奖获得者
4. **George Stigler** 乔治·施蒂格勒（1911— ）
美国当代经济学家，芝加哥微观经济学派领头人之一，信息经济学和管理经济学的创始人。1982 年度诺贝尔经济学奖获得者。
5. **economics of information** 信息经济学
这是乔治·施蒂格勒于 1961 年提出的。他认为获得信息是有成本的，信息是生产、交换、分配和销售的纽带，并以此出发，分析市场出现的许多经济现象并获得成功。由此发展形成了微观经济学的新领域：信息经济学。此前经济学假设人们决策时具有完全的有关信息，而施蒂格勒允许人们在信息不足时做决策并激发人们获取信息。
6. **without even a respectable minimum of controversy** 几乎毫无争论
7. **a separate classification** 单独的分类
8. **Index of Economic Articles** 经济学论文索引
9. **perfect information** 完整的（完全的、完善的）信息
10. **seminal contribution** 首创的（创新的）贡献
11. **its own set of...** 它自己的一套……
12. **market outcome** 市场结果

new assumptions are as patently unrealistic as the original assumption of perfect information. Much as the allowance for imperfect information initiated *a rich vein of*¹³ new work, relaxing some of the assumptions that took its place has the potential to help resolve important puzzles for economics. These include *inconsistencies*¹⁴ in the apparent degree to which people take account of the future, and the human tendency to avoid information in certain situations or fail to draw seemingly obvious conclusions from the information one receives.

One *tenet*¹⁵ of the economics of information that may *be ripe for*¹⁶ modification is the assumption that information is not valued in its own right, but only insofar as it informs decision making and enables decision-makers to secure desired outcomes. Berns et al. [3] challenge this assumption by showing that people not only dislike experiencing unpleasant outcomes, but also dislike waiting for them. Confronting human subjects with the *prospect*¹⁷ of an *impending*¹⁸ *electric shock*¹⁹, the authors find that *regions of the pain matrix*²⁰ (a cluster of brain regions that are activated during the experience of pain) are also activated in anticipation of shock. This activation intensifies as the shock becomes *imminent*²¹. The information that one is going to receive an electric shock, like the shock itself, is a source of misery.

The idea that people derive pleasure and pain directly from information, rather than from any material benefits that the information procures, has diverse implications for decision-making. As highlighted by Berns et al., utility derived from anticipating future outcomes can have a major impact on *intertemporal choices*²²—decisions involving costs and benefits that extend over time. The standard economic account of intertemporal choice predicts that people will generally want to expedite pleasant outcomes and delay unpleasant ones [4]. If, however, people derive pleasure or pain from the information that an outcome will occur in the future, they may prefer to defer desired outcomes so as to prolong the pleasure of anticipation or to expedite unpleasant outcomes so as to shorten the period of dread. In the Berns et al. study, 84% of subjects preferred to get electric shocks over with quickly. Ignoring the utility of information, the standard account would predict instead that subjects would prefer to defer the shocks.

Earlier studies *posited*²³ a causal link between anticipatory utility and the desire to get unpleasant outcomes over with quickly [5]. However, Berns et al. actually observe a correlate of dread in *the brain activity of human subjects*²⁴ and a significant relationship between *individual differences*²⁵ *in this measure*²⁶ and indi-

13. **a vein of** 一系列的, 一连串的
14. **inconsistency** 不相符合; 不一致性
15. **tenet** 宗旨, 原则、信条
16. **be ripe for...** 解决……的时机已成熟
ripe 和 mature 的区别:
 ripe 多指水果、庄稼的成熟或借喻时机的成熟
 mature 多指人的智力、体力的成熟
17. **prospect** 前景, 景色, 前途光明或堪忧的事物
18. **impending** 悬而未决的、即将来临的
19. **electric shock** 电击、触电; 电振颤; 喻惊心动魄的震动
20. **regions of the pain matrix** 痛觉基质区域, 痛域。
它是人在经历疼痛时大脑中受激活的一组区域。
21. **imminent** 急迫的、迫切的、即将来临的
22. **intertemporal choices** 内部时间选择 (行为)
这是作者介绍 G. S. Berns 等人在有关信息经济学工作的论文中所引用的新概念: 对愉悦和痛苦信息在人脑中有不同的内部时间选择行为。
23. **posit** 发现、断定
24. **the brain activity of human subject** 实验人的大脑活性
25. **individual differences** 个体差异
26. **in this measure** 在这个分寸之内的, 在这个范围内的

vidual differences in intertemporal choice behavior [6]. *In tandem with*²⁷ other recent work that highlights the role of emotions in intertemporal choice [7], and consistent with historical accounts of intertemporal choice behavior [8], these findings support the idea that the decision to delay or expedite an outcome depends critically on how a person feels while waiting. When waiting is pleasurable, people will often prefer to defer. When it is unpleasant, however, because waiting for an unpleasant outcome produces dread or waiting for a pleasant outcome generates frustration, people will prefer to expedite outcomes—even, sometimes, *at the cost of*²⁸ experiencing worse ones.

The idea that people *derive*²⁹ utility directly from information has a variety of consequences that *go well beyond*³⁰ the domain of intertemporal choice. Emotions, such as fear and excitement, can dramatically change *people's willingness to take risks*³¹ [9-11]. And utility derived from self-image—that is, from information about one's value as a person—can have *diverse ramifications*³², including encouraging *prosocial behavior*³³ [12, 13].

*Utility from information*³⁴ can also affect the demand for information. *Conventional economics*³⁵ predicts that people should prefer more information to less. If people derive utility directly from information, however, they may sometimes be motivated to avoid information, even if it is free and useful for decision-making [14]. Indeed, people often avoid *getting tested for medical conditions*³⁶ because



Fig. 1.1 Bring it on. People generally choose to get unpleasant things over with quickly.

27. **in tandem with** 协同, 联合

28. **at the cost of** 以……为代价, 花多少钱

29. **derive** 导出、获得、派生出

30. **go well beyond** 大大超出、远远超过

31. **people's willingness to take risk** 人们甘冒风险的意志(愿)

32. **diverse ramification** 多样的衍生结果

33. **prosocial behavior** 亲社会行为

34. **utility from information** 信息的效用

在经济学上信息的效用是指信息满足人们需求的能力。

35. **conventional economics** 传统经济学

就对待信息而言, 传统经济学期望获得更多信息作为决策依据, 而实际上人们有时想回避信息 (to avoid information)。

36. **getting tested for medical conditions** 接受医疗状况检查

they are afraid of getting bad news [15], and investors are more likely to look up the value of their *portfolios*³⁷ when the stock market is up (and the news about one's own portfolio promises to be favorable) than when the market is down [16].

Beyond sometimes motivating the avoidance of information, the utility associated with information also provides people with an incentive to *process information in a biased fashion*³⁸—to form “*motivated*” *beliefs*³⁹ that feel good *in the short run*⁴⁰ but can distort decision-making [17]. People *are* remarkably *adept at*⁴¹ finding reasons to believe what they wish were true and not believe what they wish were not true [18]. For example, someone who is worried about the health of a loved one is often the last to view the situation in objective terms. Instead, he or she *grasps at remedies*⁴²—however *far-fetched*⁴³—that promise hope. Or consider the many people who *fall prey to*⁴⁴ pyramid and *Ponzi financial investment schemes*⁴⁵. Although economists argue that there is no such thing as a free lunch, this behavior suggests that many people are quite willing to be persuaded otherwise.

These examples just *scratch the surface of*⁴⁶ promising directions for research on the utility of information. For example, neither economists nor psychologists have advanced a theory that can explain when and why waiting for a desired outcome is pleasurable or, instead, *frustrating*⁴⁷, even though the emotional response to anticipation may be the single most important determinant of people's willingness to *delay gratification*⁴⁸. As another example, theories of investor behavior assume unrealistically that *paper gains and losses*⁴⁹ (changes in the value of owned assets) provide the same utility as realized gains and losses (those that result from actually selling assets). Relaxing this assumption may help to explain *a wide range of*⁵⁰ *perplexing investor behaviors*⁵¹, such as the tendency to hold on to losing stocks (by holding such stocks, investors limit themselves to paper losses as opposed to actual losses). We also lack a convincing theory to account for and predict *the market bubbles and busts*⁵² that *wreak havoc on*⁵³ economies. Such a theory will almost inevitably incorporate *interactions between expectations and emotions*⁵⁴ such as the *paradigmatic*⁵⁵ “*fear and greed*⁵⁶.”

*As the first of its kind*⁵⁷, the study by Berns et al. has limitations. *Given the constraints of brain imaging*⁵⁸, for example, the *time intervals*⁵⁹ over which the study's subjects make decisions (about 30 s) are shorter than the decision intervals

37. **portfolio** 有价证券

38. **to process information in a biased fashion** 以有倾向性的方式处理信息

39. **“motivated” beliefs** “目的明确的”信念

40. **in the short run** 在短期内

41. **be adept at (in)** 对……熟练, 对……内行, 善于……

42. **grasp at remedy** 想抓住补药

43. **far-fetched** 牵强的, 牵强附会的

44. **fall prey to** 成为……的牺牲品

45. **Ponzi financial investment schemes** 庞氏金融投资骗局

Charles A. Ponzi 是意大利裔美国人, 他在 1919—1920 年间施行的骗局, 骗人向虚设的企业投资。以后来投资者的钱作为快速盈利付给最初投资者来诱使更多的人上当受骗。

46. **scratch the surface of** 对……作肤浅的探讨

47. **frustrate** 挫败, 感到灰心

48. **delay gratification** 滞后的满足

49. **paper gains and losses** (有价证券的) 账面上的升值和亏损

50. **a wide range of** 广阔范围的。例如:

He has a wide range of knowledge. 他的知识渊博。

She has a wide range of interests. 她的兴趣广泛。

51. **perplexing investor behaviors** 令人困惑不解的投资者行为

52. **the market bubbles and busts** 市场的泡沫和崩溃(失败)

53. **wreak havoc on** 对……造成浩劫(大破坏)

54. **interactions between expectations and emotions** 期望和情感之间的相互作用

55. **paradigmatic** 作为佐证的

56. **fear and greed** 恐惧和贪婪

57. **as the first of its kind** 这方面的首例是

58. **given the constraints of brain imaging** 在大脑想象力的约束下

59. **time interval** 时间间距

of greatest interest to economics. Moreover, the authors observed *the connection between dread and intertemporal choice*⁶⁰ across subjects in two separate tasks. It would provide stronger evidence that dread is playing a causal role if activation in a single task was correlated with decisions made in the same task. The authors assume, finally, *that dread is better represented by the summed total of anticipatory activation over the duration of the waiting period*⁶¹. But it might *make more sense*⁶² to represent dread as the level of activation at a particular time. These are, obviously, minor limitations given the novelty and importance of the research.

The Berns et al. study is a superb new addition to *the nascent field of neuroeconomics*⁶³ [19, 20]. It also contributes to a new wave of research in *behavioral economics*⁶⁴ that, following Stigler's lead, examines the consequences of relaxing economists' stylized assumptions about how people deal with information [21]. Both of these new lines of research have generated more controversy than Stigler's *initial insight*⁶⁵, but will likely prove similarly rich in yielding theoretical results [22].

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- [6] Also providing evidence of a relationship, across persons, between dread and intertemporal choice behavior, Hare[22] found that, whereas normal people showed physiological signs of fear well before receiving an anticipated electric shock, psychopaths, whose behavior is characterized not only by indifference to the well-being of others but also impulsivity, only exhibited symptoms of fear moments before shock onset.
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60. **the connection between dread and intertemporal choice** 恐惧和内部时间选择之间的关系
61. **dread is better represented by the summed total of anticipatory activation over the duration of the waiting period** 恐惧更宜用整个等待时间中预期的激活总量之和来代表
62. **make more sense** 更讲得通、更有道理
make sense of sth. 懂得（理解）……的意思
63. **the nascent field of neuroeconomics** 神经经济学的新生领域
64. **behavioral economics** 行为经济学
行为经济学是经济学的新兴领域，它将心理学行为分析理论与经济运行规律有机地结合，研究复杂的、不完全理性的市场中的投资、储蓄、价格、文化等种种经济现象。由于考虑到心理学的因素，使得经济学理论对实际情况的预期结果更好、制定的政策更合理。美国普林斯顿大学的丹尼尔·卡尼曼（Daniel Kahneman）教授是行为经济学的奠基人，2002年他获得了诺贝尔经济学奖，使这一新学科更受瞩目。
65. **initial insight** 初始的认识（见解）

miserable. Such curiosity is such a powerful, and often self-destructive, motivator of human behavior that many psychologists advocate classifying curiosity as a drive, like hunger and thirst (20).

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Exercises

1. Why some important puzzles in economics can be revealed by the allowance for imperfect information?
2. Do you agree the argument that the information is functioned as a source of pleasure and pain of people?
3. Could you describe some examples on emotions which can convert people to take risks on stock market?

Text 2

What Future Will We Choose for Physics?

Sol M. Gruner, James S. Langer, Phil Nelson, Viola Vogel

(*Physics Today*, p.25, Dec. 1995)

Science in the United States is in a time of *pain and uncertainty*¹. The pain is felt most acutely by young scientists, who are having great difficulty establishing their careers. The uncertainty about the duration and outcome of the current situation *stems from its roots in*² *ponderous*³ events of recent history—the end of the cold war, *industrial downsizing*⁴, government deficits and *demographic trends*⁵. Although budget difficulties and lack of jobs *plague*⁶ most of the sciences, the atmosphere of uncertainty about the future is *palpably*⁷ different from one profession to the next. Our concern here is with the profession of physics.

The natural tendency, especially among those of us in the *physics community*⁸ whose careers are well established, is to hope that current problems will *work themselves out*⁹, as they have in the past, and that better times will resume without *substantive changes*¹⁰ in our way of life. The data to be presented here suggest that such *complacency*¹¹ is dangerous, both because the *extrapolation*¹² of current trends is clear and undesirable, and because there are steps that can be taken to alter the path of events. It seems to us, the authors of this article, that serious discussion about the future of the physics profession should focus less on external events that physicists cannot control and more on the field itself. We therefore believe that this is precisely the right time for our community to undertake a *soul-searching analysis*¹³ of the profession—its historical evolution, its current health and, above all, our aspirations for its future.

The analysis presented here focuses primarily on *academic physics*¹⁴, where serious problems exist and where important decisions must soon be made. But we believe that what we are saying is very important for the field as a whole, and that all of us, especially physicists in industry and government, must participate in