

食品のリスク認知

共通性と文化差

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東京

Perception of Foodborne Risk

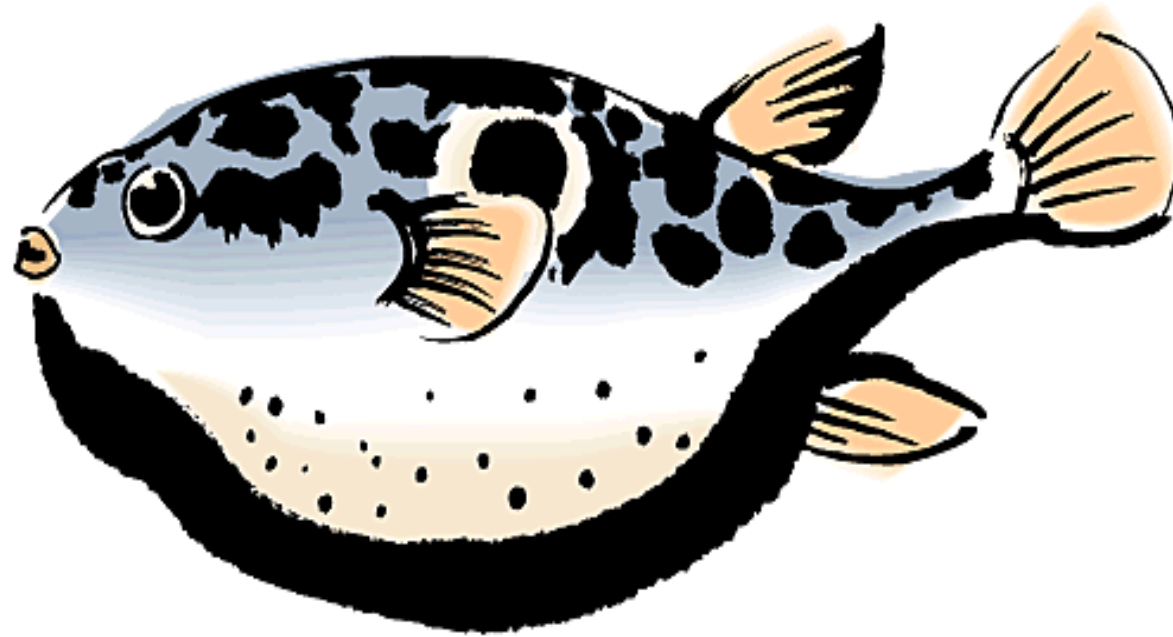
Cognitive Universals and Cultural Differences

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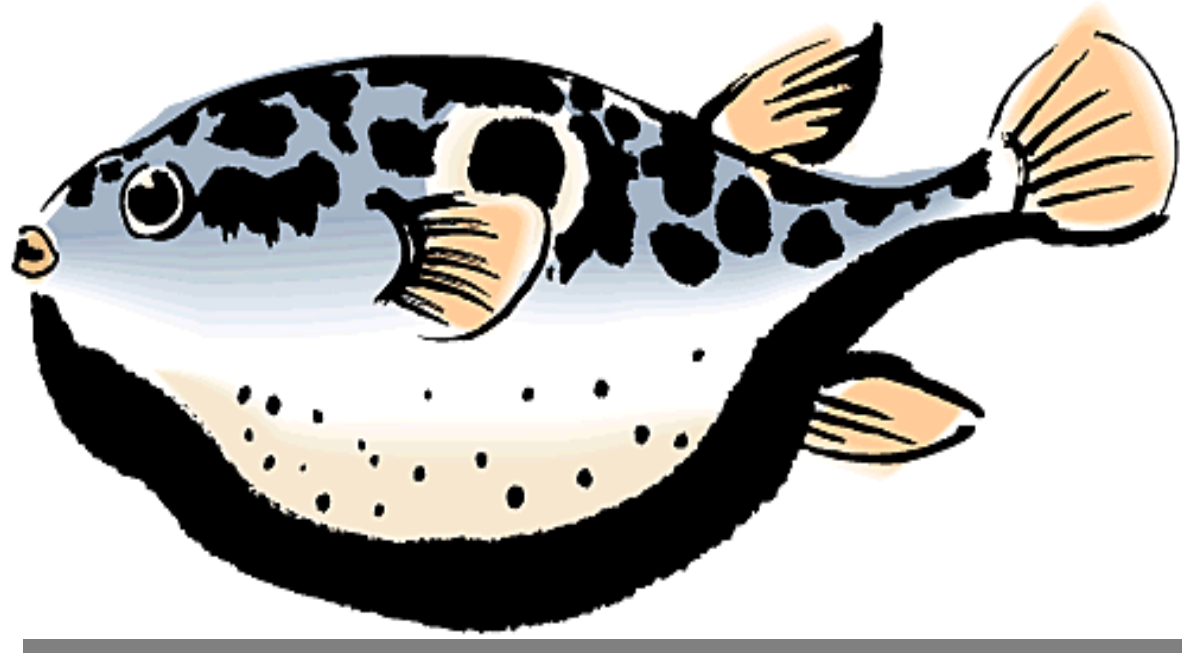
Tokyo, September 17, 2008

消費者は、本当に「ゼロリスク」
を求めているのか？



フグ

Do consumers *really*
want “zero risk” ?



FUGU

正反対？
遺伝子組換え食品
に対する欧州と米
国の認識

Worlds Apart? The Reception of Genetically Modified Foods in Europe and the U.S.

George Gaskell,^{1*} Martin W. Bauer,² John Durant,³ Nicholas C. Allum¹

Recent controversies about genetically modified foods in the United Kingdom and several other European countries highlight the apparent differences that exist in public opinion on this subject across the Atlantic. Why are people in the United States seemingly untroubled by a technology that causes Europeans so many difficulties? The results of survey research on public perceptions of biotechnology in Europe and the United States during 1996–1997, together with an analysis of press coverage and policy formation from 1984 to 1996, can help to answer this question.

An international study of biotechnology in the public sphere (1) sheds some light on why genetically modified (GM) foods are so much more controversial in Europe than in the United States. Here, we compare public perceptions of five applications of modern biotechnology and look for explanations for the differences between Europe and the United States in terms of media coverage, trust in the regulatory process, and scientific literacy.

In October 1996 a representative sample survey (about 1000 respondents per country) was conducted in all 15 member states of the European Union, together with Norway and Switzerland (henceforth "Europe"). The key questions were also used in a U.S. survey in late 1997 (2). These surveys were conducted 2 to 3 years ago and over a period of roughly a year; hence, our data provide a historical snapshot of public perceptions in 1996–1997. Of course, with the rapid advance of food biotechnologies and other developments in the life sciences (such as the cloning of Dolly the sheep), we would not expect to find the same opinions and attitudes in 1999. But the use of similar questions in the surveys makes it possible to look at comparative structural differences in the pattern of public perceptions that may hold clues to understanding the situation in 1999.

Respondents were asked whether they thought each of five biotechnologies—genetic testing, GM medicines, GM crops, GM food, and xenotransplantation (GM animals for use in human transplantation)—was useful, risky, morally acceptable, and to be encouraged (2). Figure 1 shows the mean levels of support (encouragement), on a scale from

+2 to -2, for all the applications.

People in Europe and the United States showed varied levels of support across the different applications. GM medicines and genetic testing received the most support, GM crops and GM foods received intermediate support, and xenotransplantation received the least support. There was not always strong support for biotechnology in the United States; for example, the average U.S. respondent was opposed to xenotransplantation. Moreover, U.S. respondents were not always more supportive than European respondents; for example, Europeans were more supportive of genetic testing, whereas people in the United States were significantly more supportive of GM crops and GM foods than were people in Europe.

When the surveys were conducted, biotechnology was a relatively unfamiliar topic. On the questions about the five applications, 19% of the U.S. respondents and 27% of the European respondents did not give a complete set of responses. With this level of unfamiliarity, we can assume that some people responded to the questions with "nonattitudes" (3). Such responses would be likely to be volatile if, for example, the issue became more controversial. To this extent we must be cautious in our interpretations of and extrapolations from the survey results. In the absence of a filter question allowing us to exclude those people with "no opinion" (4), the following anal-

ysis uses only those who gave a full set of responses, on the assumption that they were more likely to have better formed opinions. Judgments of use, risk, moral acceptability, and encouragement were each collapsed into a dichotomy (useful/not useful, and so forth) so as to model patterns of response (henceforth "logics") over the four dimensions of attitude. This produces 16 possible combinatorial logics (Table 1), but empirically only three were widely used.

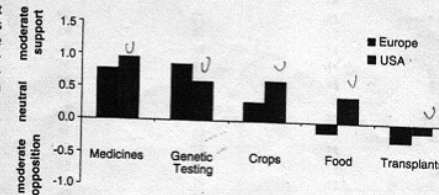
Logics 1 and 2 are similar in being supportive, but they display different perceptions of risk. For the "supporter," risk is not an issue. The "risk-tolerant supporter" sees but then discounts the risk. Opponents take a position exactly opposite to that of supporters.

Table 2 shows the distribution of these three prevalent logics for each application. For GM medicines and genetic testing, supporters constituted the single largest category. Levels of risk-tolerant support were also relatively high, and levels of opposition were relatively low. Greater opposition to genetic testing in the United States ($P < 0.05$) than in Europe may indicate a sensitivity about genetic privacy in the context of work, credit, or insurance. In contrast, for xenotransplantation, supporters and risk-tolerant supporters totaled only 36% in Europe and 42% in the United States, with about 33% in opposition.

Turning to GM crops and GM foods, we see a contrast between Europe and the United States. Both GM crops and GM foods were better supported in the United States than in Europe (for both contrasts, $P < 0.05$). For both applications, there were fewer supporters and more opponents in both the United States and Europe. The contrast is greatest in the case of GM foods, to which 30% of Europeans were opposed.

A fourth possible logic—"moral opponents" (in the context of Table 1, answers =

Fig. 1. Mean support for five applications of biotechnology. The United States and Europe differ significantly for each application (F values from one-way analyses of variance for each application were all significant at $P < 0.05$).



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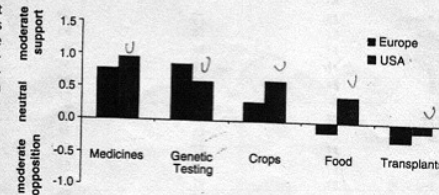
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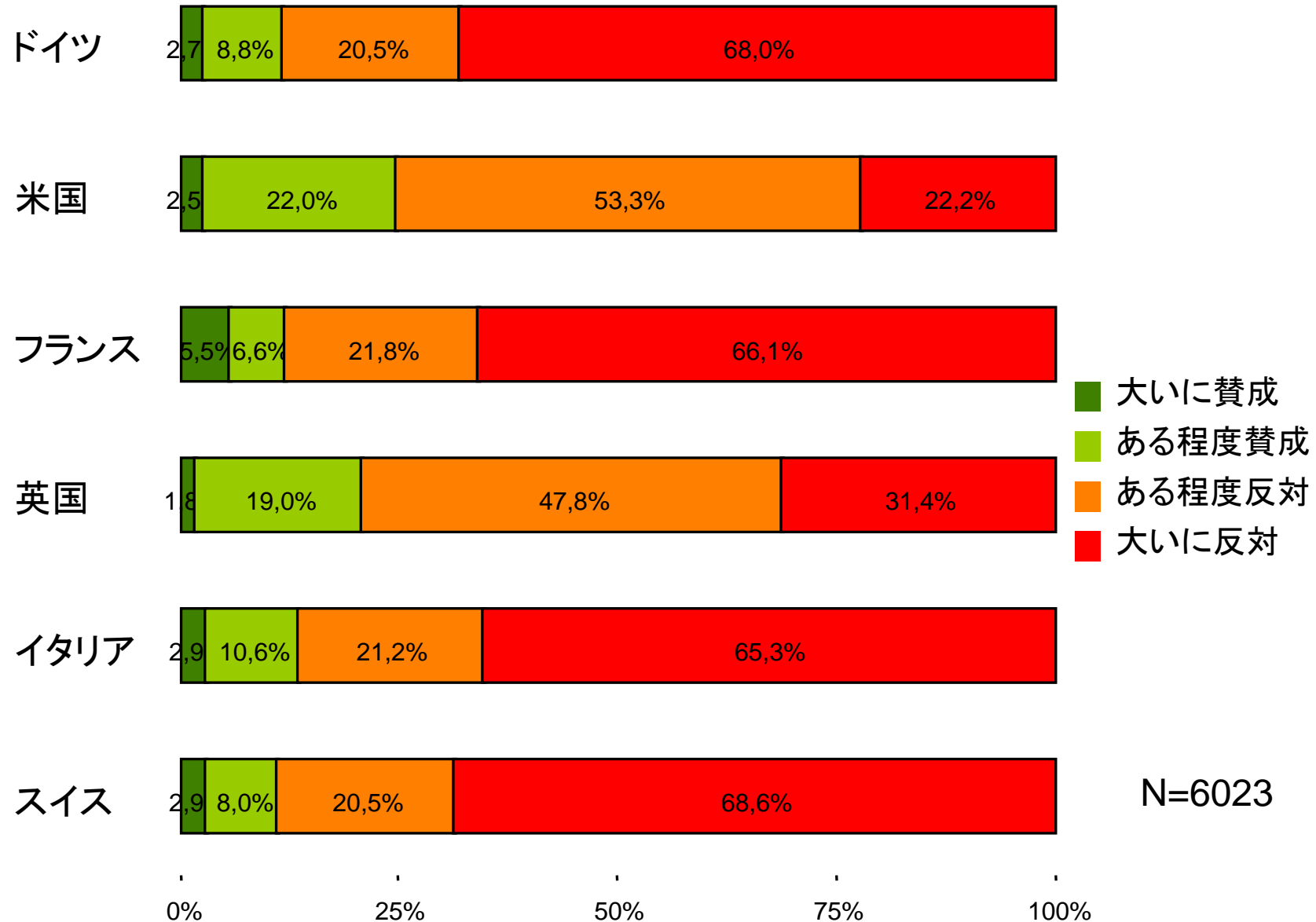
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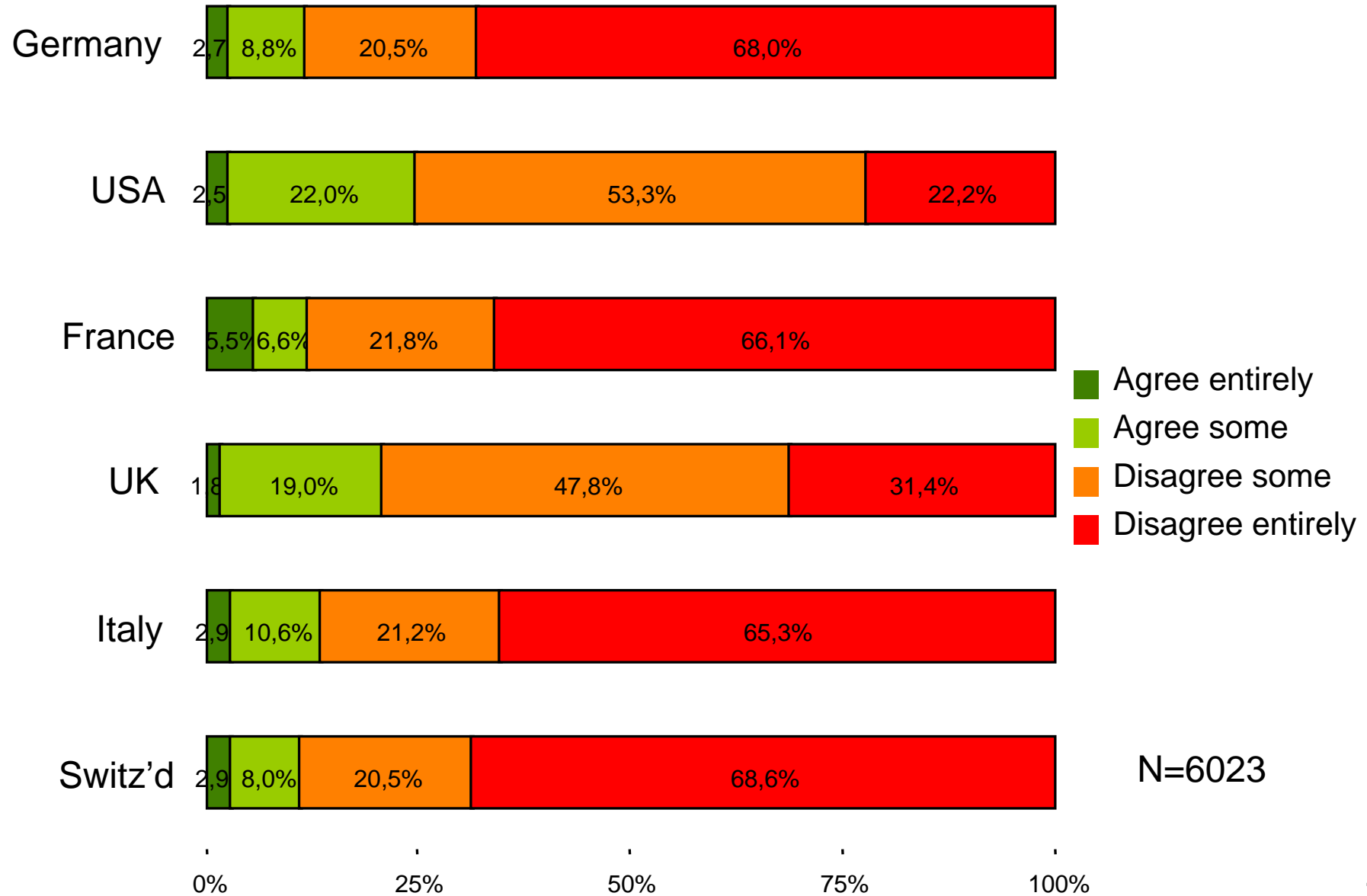
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「遺伝子組換え食品(GMO)に対する姿勢」



“In favor of GMOs in Food”



GMO:文化差

- ある程度の文化差はあるが・・・
 - 英語圏の人は、それほど強い感情を抱いていない
 - 否定的な意見は少数である
- ……本質的には不変である
 - 大多数がGMOに反対している
 - 英米も含まれる

GMOs: Cultural difference...

- In extent...
 - English speakers feel less strongly
 - Are less negative
- ...but not in nature:
 - A majority against GMOs
 - Including in UK and US

概略（もしくはアウトライン）

- 共通点
 - 明確な普遍性
 - 先入観、新たな発見
- 相違点
 - 長期間にわたり、驚くほど一貫している
 - しかし、変わりやすい

Outline

- Similarities
 - Apparently universal features
 - Bias, heuristics
- Differences
 - Surprisingly consistent over time
 - Yet susceptible to changes

1. 明確な普遍性

1. Apparently universal features

普遍性

- リスクの認知バイアス
- 魔術的思考：食は人を表す
- 化学物質よりも、自然なものが好まれる
- 動物性食品と植物性食品

Universals

- Cognitive biases in risk perception
- Magical thinking: You are what you eat
- Natural is preferred (chemicals --)
- Animal vs Plant food

専門家と一般人のリスク評価の比較

	女性有権者	大学生	環境保護 団体	専門家
原子力	1	1	8	20
自動車	2	5	3	1
銃	3	2	1	4
タバコ	4	3	4	2
オートバイ	5	6	2	6
アルコール	6	7	5	3
自家用機	7	15	11	12
X線	22	17	24	7

Slovic(1987年)

Expert vs Lay Rating of Risks

	W. Voters	Students	Club	Experts
Nuclear	1	1	8	20
Automobile	2	5	3	1
Guns	3	2	1	4
Tobacco	4	3	4	2
Motorcycle	5	6	2	6
Alcohol	6	7	5	3
Private Av.	7	15	11	12
X Rays	22	17	24	7

Slovic, 1987

専門家と一般人のリスク評価の比較

	一般人	専門家
原子力	1	20
X線	22	7

Expert vs Lay Rating of Risks

	Lay	Experts
Nuclear Energy	1	20
X Rays	22	7

なぜ異なるのか？特定要因

- リスクの構造
- 人間の知覚特性
 - 人間固有の性質
- 食品リスクに特有の側面
 - 魔術的思考

Why? Identified Factors

- Risk Configuration
- Human Perception
 - Specific features of the human mind
- The very specific dimension of food risk
 - Magical thinking

不安と反感を招く要因

不安と反感 ++

近い
強要されたリスク
自分ではなく他人の利益
制御不可能
人為的原因
目新しい技術

不安と反感 -

遠い、抽象的
熟考した上でのリスク
利益なし
制御可能
自然的原因
身近な技術

Fear & Outrage Factors

Fear & Outrage ++

Proximity

Imposed risk

Benefit to others, not self

Impossible to control

Human cause

Novel Technology

Fear & Outrage -

Distance, abstraction

Deliberate risk

No benefit

Controllable

Natural cause

Familiar Technology

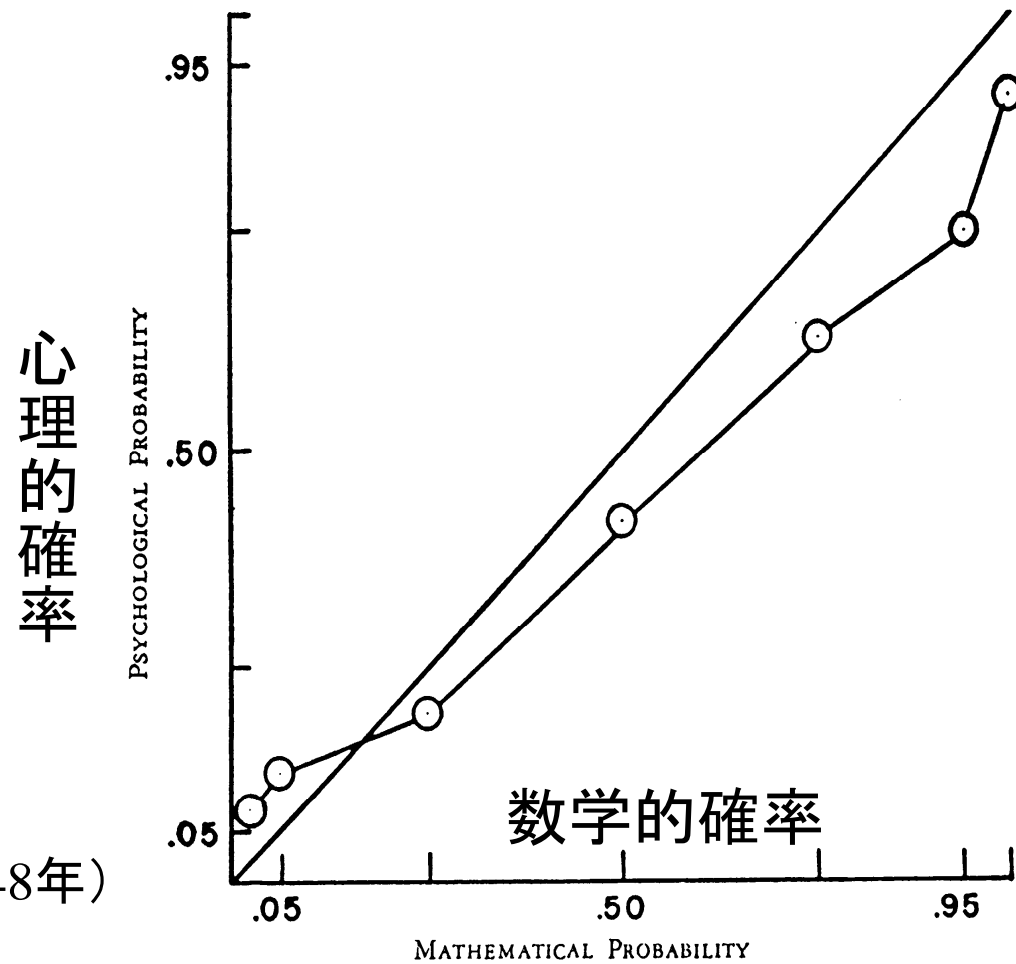
認知にかかわる要因

- 確率論的思考は直感的でない
- リスクとは確率論的な概念である
- リスクについての一般的な考え方は、確率論的でなく、イエスかノーかの判断である
- しかし、これは「愚かでも気まぐれでもなく」(カーネマン)、予測可能な面もある
- 統計と経験は、なかなか一致しない

Cognitive Factors

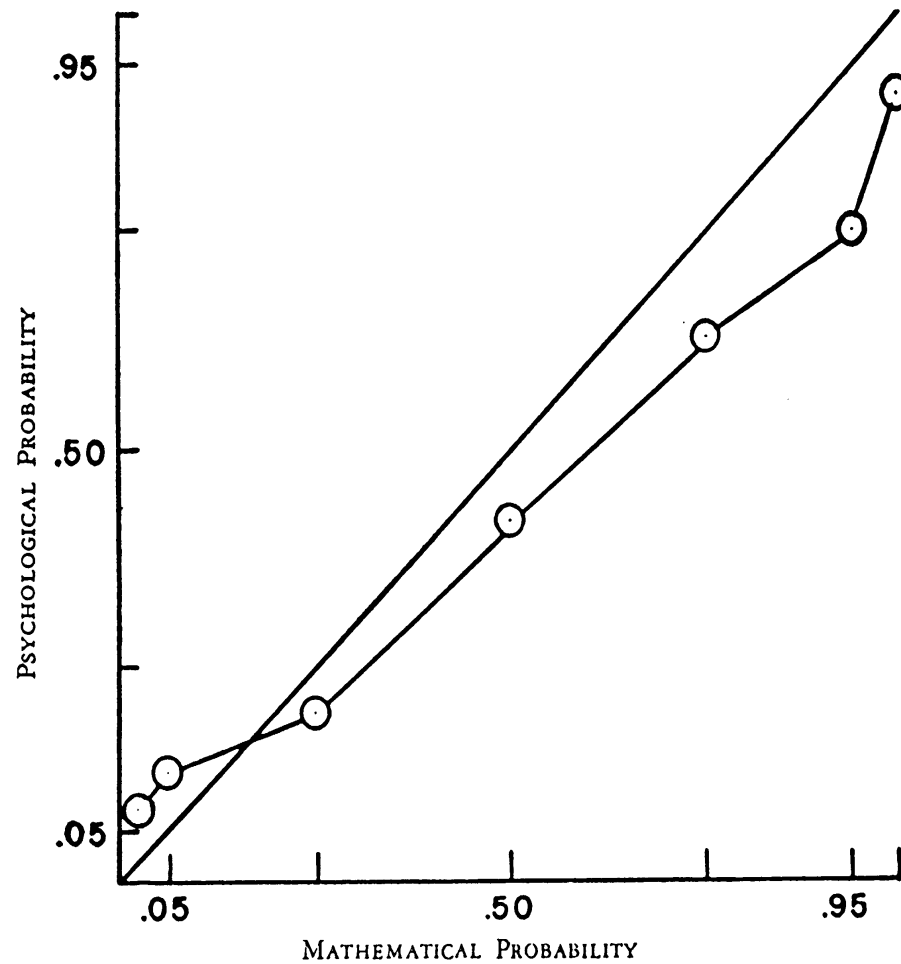
- Probabilistic thinking is counter-intuitive
- Risk is a probabilistic notion
- Common way of thinking about risk is non-probabilistic: A yes/no view of risk
- Yet they are « neither foolish nor capricious » (Kahneman), partly predictable
- Statistics and experience are difficult to reconcile

数学的確率と心理的確率



PrestonおよびBaratta(1948年)

Mathematical vs psychological probability



Preston & Baratta (1948)

心理的確率

普遍的な認知バイアス:

- 低い確率 ($p < 0.35$) が重視されている
- ごく低い確率 (1/10,000、1/100,000、1/1000000) が過剰に重視されている
- 比較的高い確率 ($p > 0.4$) が軽視されている
- 0.7を超える確率があまりにも軽視されている

Psychology of Probability

A universal cognitive bias:

- Small probabilities overestimated ($p < 0.35$)
- Very small probabilities enormously overestimated (1/10 000, 1/100 000 or 1/1000 000)
- Larger probabilities underestimated ($p > 0.4$)
- Probabilities above 0.7 vastly underestimated

食品：極めてデリケートな分野

- 具体的な不安
- 食品は最も身近な消費である
- 食品と魔術的思考
- (肉類と動物性食品は特にデリケートな問題)

Food: A Highly Sensitive Area

- Specific fears
- Food is the most *intimate* form of consumption
- Food & magical thinking
- (Meat and animal food are particularly sensitive)

魔術的思考の法則

- 感染:「いったん接触したら、常に接触している」
- 類似性:「イメージ＝対象物」
- 「食は人を表す」:感染＋類似性
- 単なる「原始的」な特徴ではない

Laws Of Magical Thinking

- Contagion : “Once in contact, always in contact”
- Similarity : “Image equals object”
- « You are what you eat » : contagion + similarity
- Not just a « primitive » trait

NemeroffおよびRozin(1989年) 「食は人を表す」

- アッシュの印象形成法
- ペンシルベニア大学生
- 人物の性格をランク付け
- 南太平洋「文化」の説明
 - イノシシを食べ、カメは狩るが食べない
 - カメを食べ、イノシシは狩るが食べない

Nemeroff and Rozin, 1989

“You are what you eat”

- Asch impressions technique
- U of Pennsylvania students
- Rate personalities of the people
- Description of South Pacific “Culture”
 - Eat boar and hunt turtles but do not eat them
 - Eat turtles and hunt boar but do not eat them

温厚 1 2 3 4 5 6 7 8 攻撃的

イノシシを食べる人の印象:

より毛深い、浅黒い、攻撃的、泳ぎが下手

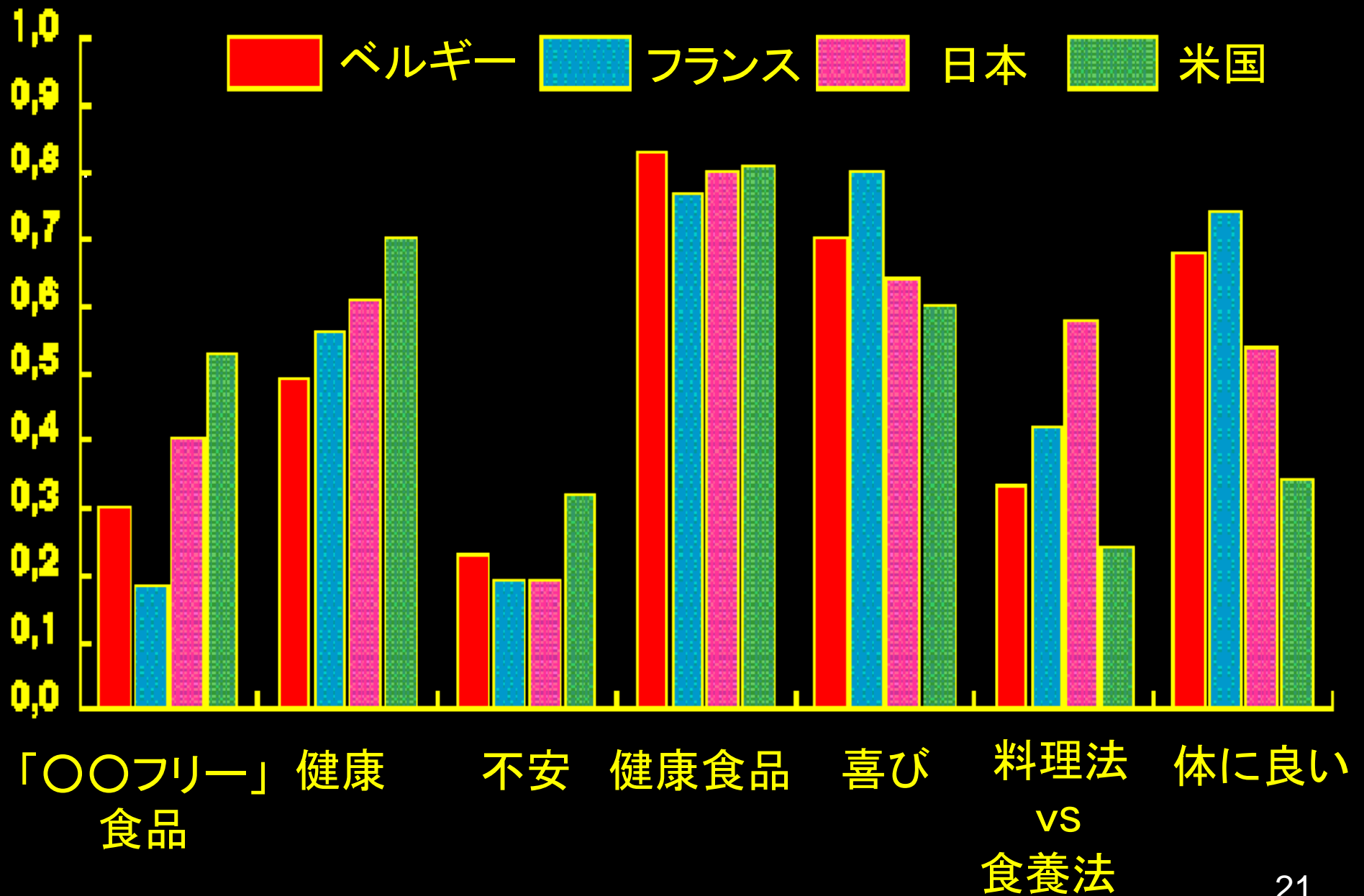
Peaceful 1 2 3 4 5 6 7 8 aggressive

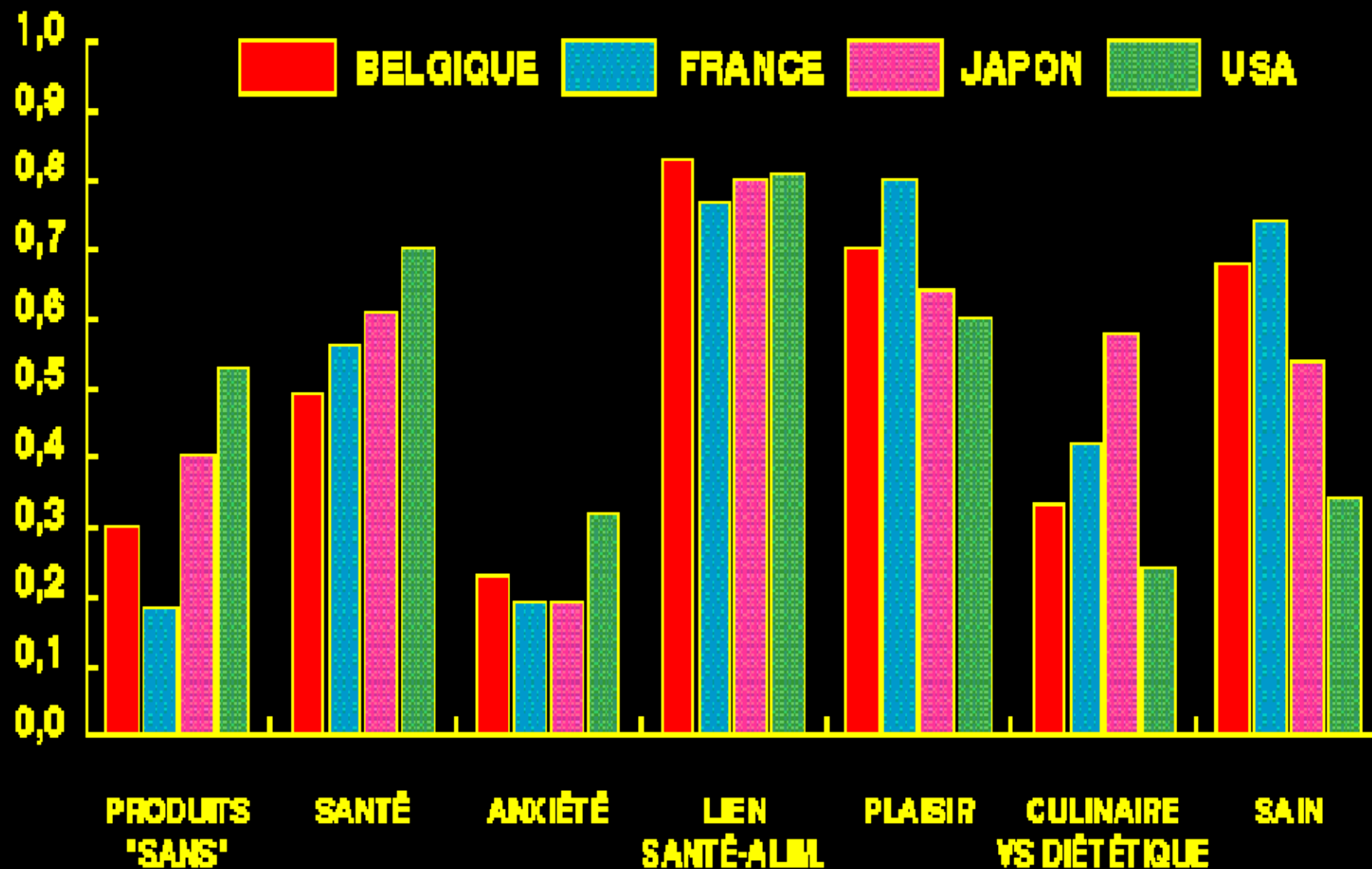
Boar eaters are:

Hairier, darker, more aggressive,
poorer swimmers

2. 文化的多様性とリスクの「枠組み」

2. Cultural variability and the “framing” of risk





OCHAの調査：米国

- 食べるとは「栄養を摂取する」こと
- 食品とは「栄養」のこと
- 食品とは栄養区分のこと
- 食品とは個人的・私的なもの
- 食べるとは合理的な選択を下すこと
- 「トレードオフは簡単である」

The OCHA survey: USA

- Eating is *nutrition*
- Food is *nutrients*
- Foods are nutritional categories
- Food is individual, personal
- Eating is making rational choices
- “Trade-off is so easy”

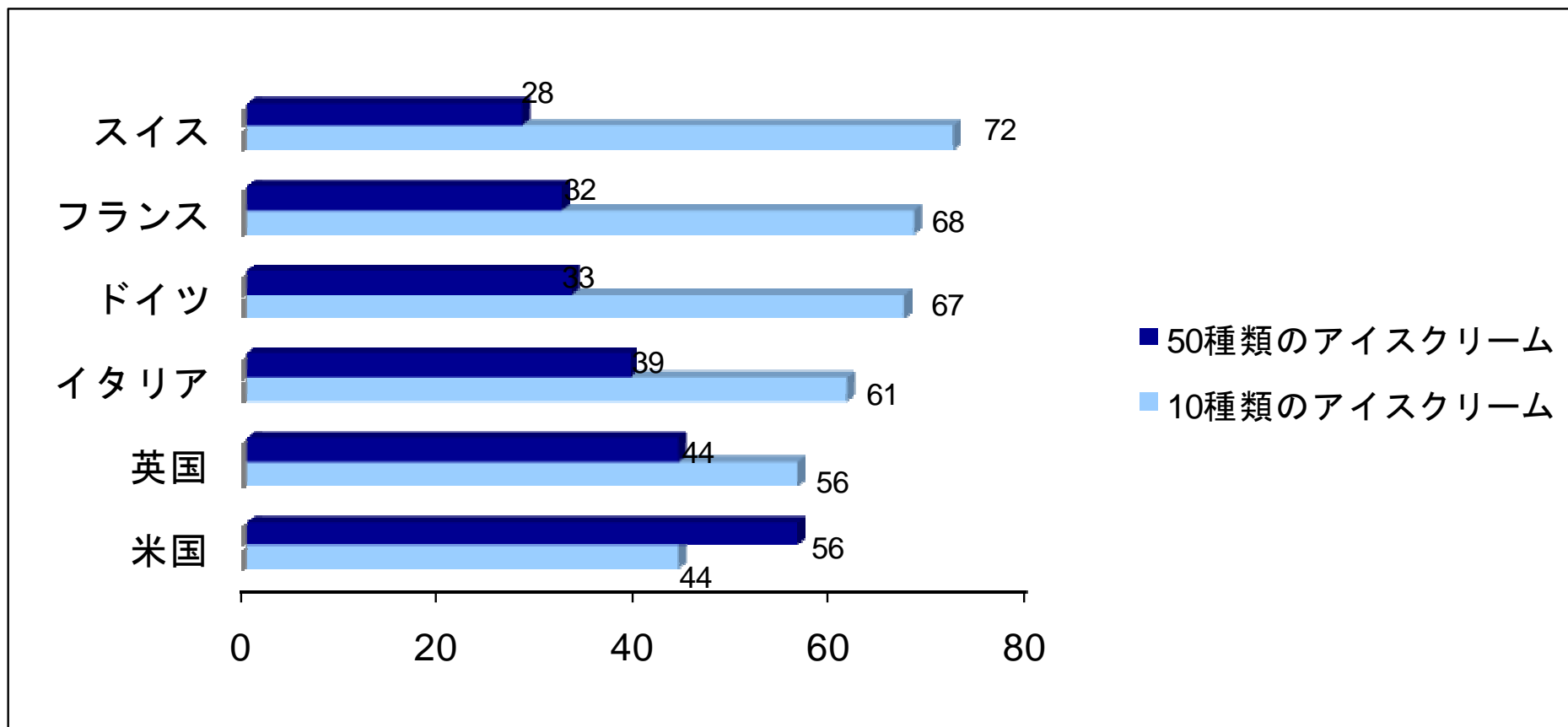
フランス、イタリア、南欧

- 食べるとは社会的なこと
- 喜びの共有、共有する喜び
- キーワード：多様性、バランス、和気あいあい
- 品質の問題

France, Italy, Southern Europe

- Eating is social
- Sharing of pleasure and pleasure of sharing
- Keywords: diverse, balanced, convivial
- The issue of quality

選択肢の最大化

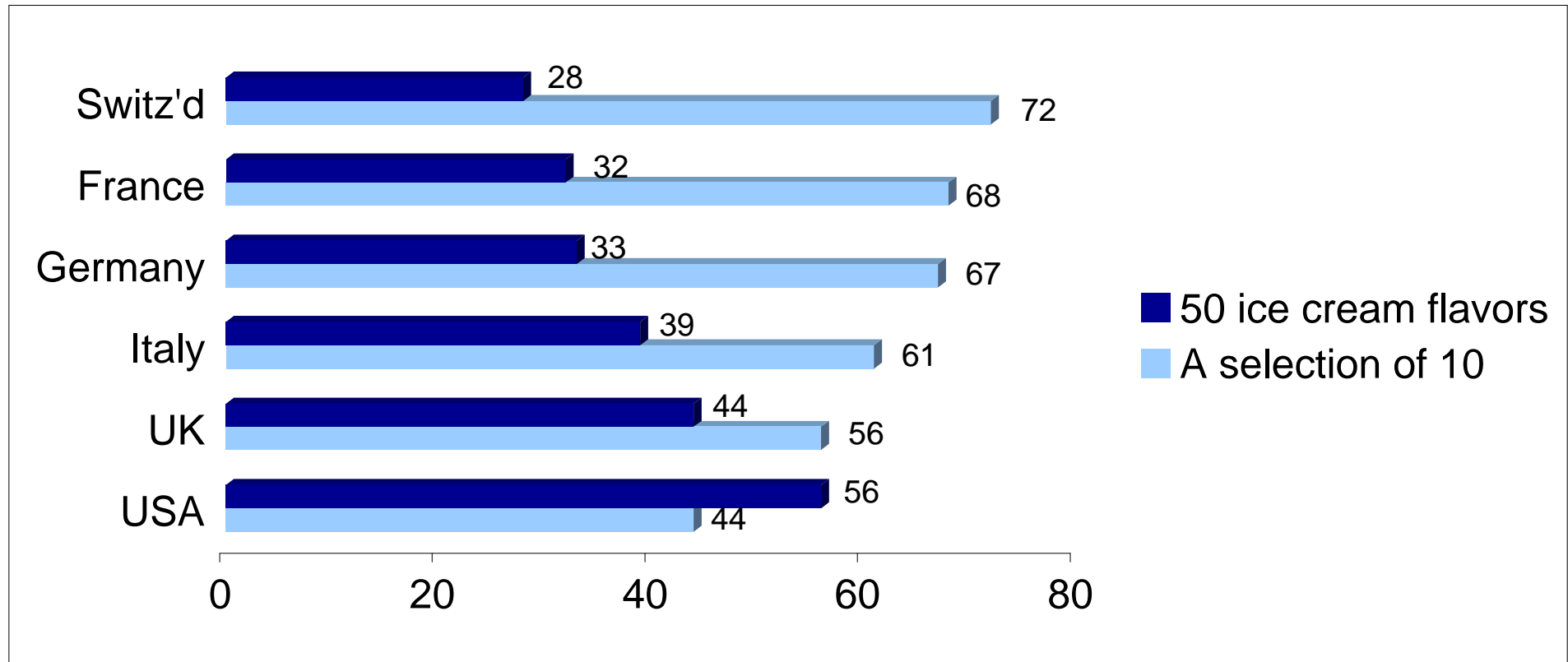


アイスクリームを食べる場合を考えてみよう。2つのアイスクリーム店があると想定する。一方の店には50種類の味があり、もう一方は10種類を提供する。どちらの店に行きたいと思うか？

(価格は同じとする)

(N>6032)

Maximization of choice



You want to eat ice-cream. You have a choice between two ice-cream parlors. One offers 50 flavors, the other a selection of ten. Which of the two do you prefer (prices equal) ?

(N>6032)

昔のほうがおいしかったか？

40～50年前と比較して、現在の食品をどう評価するか？

%	ドイツ	米国	フランス	英国	イタリア	スイス	全体
味が落ちた	33.2	24.0	61.1	30.6	52.8	43.7	39.2
同じ	40.8	31.9	24.0	22.5	18.0	26.5	27.7
おいしくなった	26.0	44.1	14.9	46.9	29.2	29.8	33.1
合計	100.0	100.0	100.0	100.0	100.0	100.0	100.0

$N=6032$ $\chi^2=583.5$ $ddl=10$ $p=0.001$

Better taste in the past ?

Compared to 40 or 50 years ago, would you say that our foods today...

%	Germany	USA	France	UK	Italy	Swzd	Global
Taste worse	33.2	24.0	61.1	30.6	52.8	43.7	39.2
Taste the same	40.8	31.9	24.0	22.5	18.0	26.5	27.7
Taste better	26.0	44.1	14.9	46.9	29.2	29.8	33.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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昔のほうが健康的だったか？

40～50年前と比較して、現在の食品をどう評価するか？

%	ドイツ	米国	フランス	英国	イタリア	スイス	全体
健康的でなくなった	60.1	51.0	56.0	45.0	70.7	57.9	56.2
同じ	21.6	19.4	18.5	16.7	12.0	22.5	18.6
健康的になった	18.3	29.6	25.5	38.3	17.3	19.6	25.3
合計	100.0	100.0	100.0	100.0	100.0	100.0	100.0

$\chi^2=220.3$ $ddl=10$ $p=0.001$

Healthier in the past ?

Compared to 40 or 50 years ago, would you say that our foods today are :

%	Germany	USA	France	UK	Italy	SwitzÖd	Global
Less healthy	60.1	51.0	56.0	45.0	70.7	57.9	56.2
As healthy	21.6	19.4	18.5	16.7	12.0	22.5	18.6
More healthy	18.3	29.6	25.5	38.3	17.3	19.6	25.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Khi2=220.3 ddl=10 p=0.001

表I. 食品14種類のリスクに関する不安の平均評価値(国別)

食品14種類のリスクに関する不安の平均評価値
(1=まったく不安を感じない~4=大いに不安を感じる)

	平均値	標準偏差
スウェーデン	2.3 0.50	フランス 2.7 0.57
オランダ	2.3 0.53	スロベニア 2.7 0.55
フィンランド	2.4 0.54	ルクセンブルク 2.7 0.61
エストニア	2.5 0.62	ポルトガル 2.7 0.67
スロバキア	2.5 0.57	ハンガリー 2.8 0.67
オーストリア	2.6 0.56	リトアニア 2.8 0.66
スペイン	2.6 0.74	ラトビア 2.8 0.69
アイルランド共和国	2.6 0.68	ポーランド 2.9 0.55
ベルギー	2.6 0.57	マルタ 2.9 0.65
デンマーク	2.6 0.60	イタリア 3.0 0.57
チェコ共和国	2.6 0.63	ギリシア 3.0 0.62
英国	2.6 0.60	キプロス 3.0 0.65
ドイツ	2.6 0.65	EU全体 2.7 0.64

Table I. Mean rating of worry across 14 food risk by country.

Mean rating of worry across 14 food risks (1 = not at all worried to 4 = very worried)					
	Mean	S.D.		Mean	S.D.
Sweden	2.3	0.50	France	2.7	0.57
Netherlands	2.3	0.53	Slovenia	2.7	0.55
Finland	2.4	0.54	Luxembourg	2.7	0.61
Estonia	2.5	0.62	Portugal	2.7	0.67
Slovakia	2.5	0.57	Hungary	2.8	0.67
Austria	2.6	0.56	Lithuania	2.8	0.66
Spain	2.6	0.74	Latvia	2.8	0.69
Ireland (Rep)	2.6	0.68	Poland	2.9	0.55
Belgium	2.6	0.57	Malta	2.9	0.65
Denmark	2.6	0.60	Italy	3.0	0.57
Czech Rep	2.6	0.63	Greece	3.0	0.62
Great Britain	2.6	0.60	Cyprus	3.0	0.65
Germany	2.6	0.65	EU Total	2.7	0.64

不安と反感の枠組み

- 国が違くと「枠組み」も異なる
- 米国（英国と北欧も？）
 - 個人が管理する
 - 健康と栄養補給
- 欧州
 - 実体論者の不安
 - 食品の味と品質が落ちたという認識
 - 共に食事を楽しむ習慣がなくなってきたという認識
 - 環境面の枠組み
 - 「政治化」: 全体的な墮落の比喩

Framing of Worry & Outrage

- Different countries, different “framing”:
- US (UK, Northern Europe ?)
 - Individual control
 - Health and nutrition
- Europe
 - Substantialist worries
 - Perceived decline of taste and quality of foods
 - Perceived decline of commensalism
 - Environmental framing
 - “politisation”: metaphor of general corruption