

# Communicating Uncertainty in Intelligence Analysis

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# The Problem

There is a  
serious  
possibility  
of an  
attack.

$2/3$

$1/3$

$9/10$



# Sherman Kent's Proposed Solution

100% Certainty	
93% give or take about 6%	Almost Certain
75% give or take about 12%	Probable
50% give or take about 10%	Chances About Even
30% give or take about 10%	Probably Not
7% give or take about 5%	Almost Certainly Not
0% Impossibility	

# How Climate Scientists Solved the Problem



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



In this Summary for Policymakers, the following terms have been used to indicate the assessed likelihood, using expert judgment, of an outcome or a result:

<i>virtually certain</i>	> 99%
<i>extremely likely</i>	> 95%
<i>very likely</i>	> 90%
<i>likely</i>	> 66%
<i>more likely than not</i>	> 50%
<i>unlikely</i>	< 33%
<i>very unlikely</i>	< 10%
<i>extremely unlikely</i>	< 5%

It is *very likely* that hot extremes, heat waves, and heavy precipitation events will continue to become more frequent.<sup>1</sup>

It is *likely* that future tropical cyclones (typhoons and hurricanes) will become more intense.<sup>2</sup>

<sup>1</sup>Climate Change 2007, Summary for Policymakers, p. 12.

<sup>2</sup>Climate Change 2007, Summary for Policymakers, p. 12.

# Survey of Intelligence Analysts

24 Analysts were asked to:

- List words or phrases they use in their work.
- Indicate likelihood meant to be conveyed.

# Large Variation in Assigned Values

## Possible/Possibly

0-100

10-25

35

25-40

>50%

About 50%

Less than 50%

<50

<50%

50-60

50-60

≤50

50-70

At least 60%

## Could

0

0-100

0-<100

>25

20-30

20-50%

40%

<50

<50

an unspecified  
chance of  
happening

## Almost Certainly

>50 – 90%

80-100%

85%

+90%

90% or higher

90% or more

90-95%

90% or greater

95-100%

95-98%

99%

## Likely

## Probably/Probable

>50 – 75

60%

60-70%

70-80

+75

75% or more

75-90

80-90%

80-90%

90%

≥90

50

<50%

+50%

51% or more

50-60

50-75

>50 – 75

55-70

60-80

60-80

60-99%

70%

70-80

70-80

70-80

70%

70-90

75% or better

80

80

80-90%

80-90%

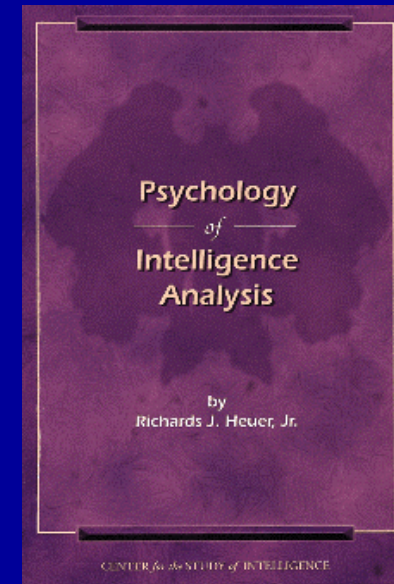
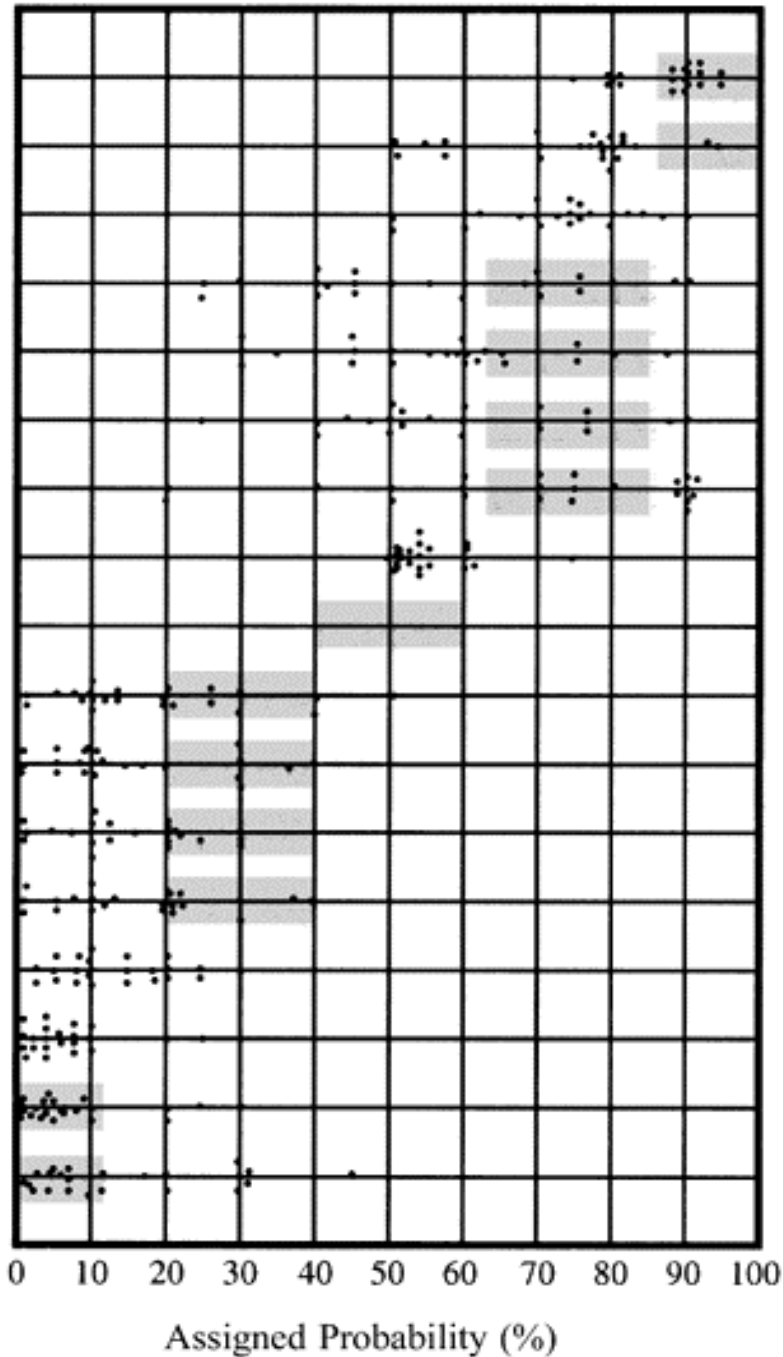
99 for product with dire implications

About 90 for product with serious implications



**STATEMENT**

Almost Certainly  
Highly Likely  
Very Good Chance  
Probable  
Likely  
Probably  
We Believe  
Better Than Even  
About Even  
We Doubt  
Improbable  
Unlikely  
Probably Not  
Little Chance  
Almost No Chance  
Highly Unlikely  
Chances Are Slight



Richards J. Heuer, Jr.,  
*Psychology of Intelligence Analysis*,  
Center for the Study of Intelligence, 1999.

Scott Barclay et al.,  
*Handbook for Decision Analysis*. (McLean, VA: Decisions and Designs, Inc. 1977), p. 66.

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# Philip Tetlock's 18-year Research Project on Expert Predictions

280 area experts in international affairs.

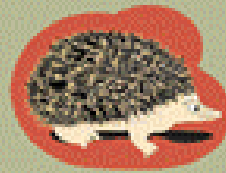
- Academics, journalists, intelligence analysts, think-tank members.
- Almost all had post-graduate training.
- 12 years average work experience.

PHILIP E. TETLOCK

EXPERT



POLITICAL



JUDGMENT

*How Good Is It? How Can We Know?*

*Experts on*

*Year  
Asked*

*Question*

Soviet Union

1988

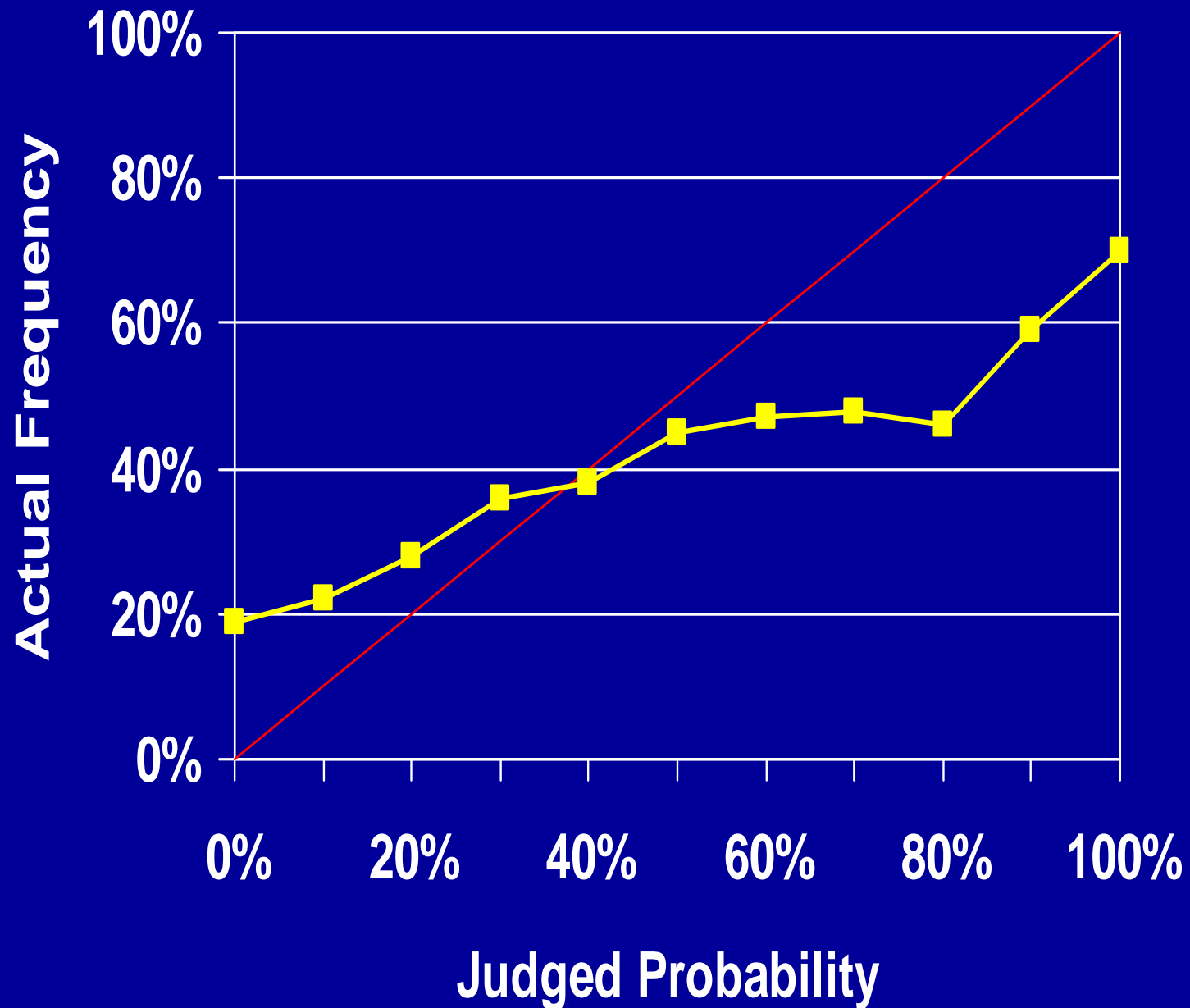
By 1992,  
Communist Party  
control will:

- strengthen
- weaken
- remain  
unchanged



<i>Experts on</i>	<i>Year Asked</i>	<i>Question</i>
<p>European Monetary Union</p>  A 500 Euro banknote is shown, featuring the number '500' in large red digits, the European Union flag, and the text '500 EURO' at the bottom left. The background includes architectural elements and stars. <p>500 EURO</p>	1991	<p>By 1996, the plan for a common currency will be:</p> <ul style="list-style-type: none"><li>▪ abandoned</li><li>▪ seriously delayed</li><li>▪ on schedule</li></ul>

# Calibration of Political Experts' Predictions At Each Level of Subjective Probability



# Intelligence Reform and Terrorism Prevention Act of 2004



The Office of the Director of National Intelligence shall review intelligence products to determine whether they . . .

“properly caveat and express uncertainties or confidence in analytic judgments”



There is a reasonable likelihood of a moderate to strong earthquake in the San Francisco Bay Area in the near future.

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