"If the Weatherman Can...": The Intelligence Community's Struggle to Express Analytic Uncertainty in the 1970s

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—Andrew Marshall, 1971

When Director of the Defense Intelligence Agency (DIA) Lt. Gen. Samuel Wilson wondered why his analysts couldn't address the likelihood of future outcomes in percentages as weather forecasters did, he spoke volumes about initiatives launched during the 1970s to more effectively express uncertainty in the Intelligence Community's (IC) analytic products.

Spurred in part by general dissatisfaction at the time with the overall quality of intelligence provided to the White House and other senior officials, the IC's efforts culminated in an "experiment" by DIA in January 1976 to incorporate percentages—reflecting the probability that a given judgment was valid—in two of its major product lines. Lessons from the IC's and DIA's struggle nearly four decades ago should be of considerable value today as the Office of the Director of National Intelligence (ODNI) revises IC Directive (ICD) 203 (*Analytic Standards)* and seeks better ways to convey analytic uncertainty about judgments in the community's products.[a1]

This article first examines the environment that pushed the IC to rethink its treatment of analytic uncertainty. It then explores DIA's uncertainty experiment and its aftermath. The article concludes by discussing lessons offered by the IC's 1970s experience.

The Environment

The Nixon White House's dissatisfaction with the IC is well known. Some trace this troubled relationship to Nixon's belief that his narrow defeat to John Kennedy in 1960 was partially due to intelligence estimates concerning the so-called missile gap.[2] Other consumers expressed dissatisfaction with the IC's work for other reasons. For example, a March 1971 Office of Management and Budget study led by future Director of Central Intelligence (DCI) James Schlesinger titled "A Review of the Intelligence Community" identified a number of problems. It asserted the IC's analysis and production had failed to keep pace with gains in technical collection. Then DCI Richard Helms acknowledged there were grounds to criticize the IC's performance on some issues, "especially for failure explicitly to acknowledge uncertainty (though for this consumers seldom show gratitude)."[3]

a. Currently the IC has no agreed upon definition for analytic uncertainty. *Wikipedia* defines "analytic confidence" as "a rating employed by intelligence analysts to convey doubt to decisionmakers about a statement of estimative probability."

All statements of fact, opinion, or analysis expressed in this article are those of the author. Nothing in the article should be construed as asserting or implying US government endorsement of its factual statements and interpretations.

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Andrew Marshall, a key member of Dr. Henry Kissinger's staff who later headed the Pentagon's Office of Net Assessment, noted there "was a sense of general dissatisfaction with the level of 'sophistication' of intelligence production." In fact, Marshall recalled that Kissinger once remarked that "analyses and commentaries in the newspapers were superior to anything he read in intelligence publications."[4] President Nixon moved to address these perceived shortcomings in November 1971, issuing a directive covering the organization and management of the IC and noting "the need for an improved intelligence product and for greater efficiency in the use of resources allocated to intelligence is urgent."[5]

Nixon's directive drove IC actions and programs for the next five years and shaped the environment in which the discussion of analytic uncertainty arose. The directive laid out multiple objectives, including improving the "quality, scope and timeliness of the community's product."[6]

To advance these efforts, the directive established the National Security Council Intelligence Committee (NSCIC—Andrew Marshall was made its chairman). The committee was to "give direction and guidance on national substantive intelligence needs and provide for a continuing evaluation of intelligence products from the viewpoint of the intelligence consumer."[7] The DCI was given additional community responsibilities and an augmented staff to discharge them.[8]

In the ensuing months, the DCI created the Product Review Group (PRG—renamed Product Review Division [PRD] in 1974) to undertake studies and conduct surveys to evaluate the quality of the community's intelligence products and their worth to the consumer.[9]

Consumer Dissatisfaction with IC's Treatment of Uncertainty

The way in which the IC conveyed analytic uncertainty became a key element in the overall effort to improve the quality of the IC's products and its analysis. Dissatisfaction with what consumers perceived as the IC's lack of analytic rigor and transparency, its presentation of unqualified conclusions, and its failure to quantify uncertainty contributed to the pressure that led to DIA's 1976 experiment with numeric probabilities.

As the head of the NSCIC, Andrew Marshall was one of the earliest and most vocal critics of IC treatment of analytic uncertainty. In a June 1973 memorandum to the heads of CIA, DIA, and the deputy director of central intelligence for the IC (D/DCI/IC) and others entitled "Displaying Uncertainty to Decisionmakers," he noted: "I remain interested in this method of analysis—especially improving the communication of appropriate levels of uncertainty in intelligence judgments. Current methods are unsatisfactory in my view."[10] Beyond expressing his dissatisfaction with the IC's practices, Marshall forwarded a RAND paper that described how uncertainty could be expressed using a variety of different, largely quantitative methods.[11]

In commenting on Marshall's memorandum, the deputy chief of the PRG acknowledged past efforts by the IC and the PRG to address uncertainty:

> *This is a matter which has been discussed at one level or another in the intelligence community for more than ten years to my own knowledge, and some experimentation has taken place, but the results are not thus far impressive....We attempted last year to get a PRG effort going on this problem, to no avail, but perhaps the time is ripe to form a working group and charge it with coming up with some recommendations for application standards and/or a community R&D effort which will result in a set of accepted probability applications and/or methods.*[12]

Whether the PRG actually chartered a working group to address analytic uncertainty is unclear, but what is certain is that consumers—especially those in the Department of Defense—continued to express frustration with the IC's methods and called for change. The NSCIC's agenda for 1974 and 1975 included multiple sessions focused on analytic uncertainty. A draft PRD memorandum noted a potential agenda item for the November 1974 NSCIC session submitted by DoD on "Intelligence Uncertainty."[13]

In submitting the proposal, an assistant to the assistant secretary of defense for international security affairs observed:

The consumer of most intelligence products dealing with complex subjects generally has an uneasy feeling about many of the unqualified conclusions or estimates that are often presented. He knows that we can't have high confidence in the answers to some of his questions. He would like a synopsis of the intelligence background and evidence or, if possible, a full scale development of them, so that he can draw his own conclusions. Where this is not possible…a well defined statement of the uncertainty is needed to permit the consumer to understand the uncertainty perceived by the intelligence analyst who made the estimate.[14]

The new year brought more calls for action. A February 1975 internal PRD memorandum to then D/DCI/IC General Wilson discussed potential NSCIC Working Group projects that again included "intelligence uncertainty," attributing the proposal to Deputy Secretary of Defense Robert F. Ellsworth.[15] Ellsworth's proposal was apparently advanced at the November 1974 Working Group session where he argued that "more qualifications and limitations should be applied to particular analytical judgments (i.e., measuring uncertainty)."[16]

In April, in providing comments on the first draft of an IC staff product *Review of National Intelligence*—a publication that included the results of PRD reviews of intelligence products—the same DoD officer who had proposed uncertainty as a topic for discussion the previous November remarked: "Very little or no attention is paid to the quality of quantitative analysis or to the reporting on uncertainty. The whole style of the product evaluation is more journalistic than analytic."[17]

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How analytic uncertainty should be addressed was again a major topic of discussion at the May 1975 meeting of the NSCIC's Working Group**.** Anthony Cordesman, chief of the Office of the Secretary of Defense's Product Evaluation Division, forwarded extensive comments and suggestions pertaining to the problem of expressing uncertainty in intelligence estimates on behalf of the deputy secretary of defense.[18] Cordesman went on at length about what he and Ellsworth saw as the shortcomings of IC products, noting they often failed to:

- *Explicitly state the limitations of the intelligence available or the methods of analysis used and present them in summary form for quick review. In many cases, even those limitations that are listed are buried in the text or listed only in footnotes or annexes.*
- *Explicitly describe the methodology used when hard intelligence data is lacking.*
- *Clearly distinguish reasonable conclusions or logical views from conclusions based on intelligence.*
- *Describe the uncertainty present in given data, methods of analysis, or conclusions.*
- *Quantify uncertainty…describe the method used to quantify uncertainty, or…show a range of numbers.*
- *List the explicit intelligence data on which a conclusion is based, and provide only a broad or vague rationale.*[19]

Cordesman concluded by stressing that the IC Staff paper apparently proposed to address these shortcomings "must not be generated in the form of a 'broad brush' treatment, or gloss over the problems involved."[20]

During the next six months analytic uncertainty continued to generate interest by the NSCIC and action by the IC Staff. A memorandum to General Wilson noted that as a follow-on action to a July NSCIC Working Group meeting, "we owe the Group one or two papers on the problem of quantifying uncertainties," adding that "Ellsworth is especially interested in this."[21]

In October, Cordesman reminded the IC Staff of Ellsworth's interest in the topic and the importance of properly conveying analytic uncertainty:

> *I am certain that you both agree that the lack of proper uncertainty data represents a critical problem in current national intelligence production. In far too many cases, consumers have no way of knowing the reliability of the data they are given.*[22]

Cordesman suggested that it would be useful if the IC Staff could provide

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a progress report at the next meeting, in October, of the NSCIC Working Group, paying particular attention to the extent to which "explicit quantitative statements of uncertainty" were used in figures shown in the NIEs and other national-level products and whether "explicit summary statements of the major limitations and uncertainties in the intelligence" were included as well.[23]

In preparing for the October meeting, the IC Staff advised General Wilson that the latest, 1975, version of NIE 11-3/8, *Soviet Forces for Intercontinental Conflict Through the Mid-1980s,* reflected "considerable improvement" in expressing uncertainties.[24] The memorandum to the D/DCI/IC also noted that in response to his request the CIA's deputy director for intelligence had launched a study on analytic uncertainty.[25]

Other Factors Pushing for DIA Experiment

Some of the criticism voiced in the Working Group on the treatment of analytic uncertainty resonated with the community's analysts and leaders. Sherman Kent's "Words of Estimative Probability" and David L. Wark's "The Definition of Some Estimative Expressions"—both published in the same 1964 edition of *Studies in Intelligence*—superbly captured this perennial challenge and how "poets" and "mathematicians" in the IC differed on how best to meet it.[26]

In the decade following the Kent and Wark articles, one finds evidence that efforts were made in IC products to quantify the probabilities associated with specific judgments.[27] However, the record shows that estimative language such as *probable, unlikely,* and *almost certain*—albeit aided by the work of Kent and Wark—remained the IC norm for expressing analytic uncertainty.[28] Nonetheless, one of the speakers at the August 1975 seminar "Intelligence Analysis Today in CIA" argued that "intelligence analysis would be improved if the analyst would a make a greater effort to assess and express the probabilities he attaches to his analysis."[29]

The push to use numeric probabilities benefited as well from the promise of new social science techniques and the willingness to use them. *Studies in Intelligence* published two articles on the use of the Bayesian theory in one issue in 1972. The first, attributed to former intelligence analyst Jack Zlotnick, described the result of a study CIA had conducted on the use of the Bayes Theorem for intelligence analysis, in which he wisely observed, "The very best intelligence can do is to make the most of the evidence without making more of the evidence than it deserves." The second, by Charles Fisk, a CIA economic analyst, described an experimental application of the theory in the case of the warning of a crisis in the Sino-Soviet relationship late in the 1950s.[30]

Policymakers as well as IC members saw potential benefit from employing more rigorous methods.[31] Andrew Marshall, for one, urged CIA analysts in an advanced intelligence seminar to try "new forms of presentation and new techniques," subsequently citing DIA's own project in 1972 to produce an experimental product using Bayesian analysis.[32]

CIA's *Handbook of Bayesian Analysis for Intelligence Analysis*—published in June 1975—offers even better insight into the perceived value associated with these new methods. In identifying the capabilities and benefits provided by Bayesian statistics, the handbook noted:

> *The use of quantified judgments allow the results to be displayed on a numerical scale, rather than through the use of terms like "probable," "likely," "unlikely," or "possible."...OPR's* [Office of Political Research in CIA's Directorate of Intelligence] *experience suggests that it is relatively easy to induce analysts accustomed to qualitative expressions of probability to shift to numerical assessments."*[33]

It is not surprising that the IC Staff provided the NSCIC Working Group members a copy of the *Handbook of Bayesian Analysis* following the October 1975 session.[34]

DIA's Uncertainty Experiment: Why DIA and What Did It Entail?

In addition to the foregoing pressures, the outlook and experience of DIA's leadership were important factors in the agency's decision to pursue an experiment in expressing analytic uncertainty. DIA's director in the 15 months leading up to experiment in January 1976 was Lt. Gen. Danny Graham. Before taking command, General Graham had extensive

experience in drafting and directing intelligence estimates in Army intelligence, CIA's Office of National Estimates (ONE), and DIA's Estimates Directorate.[a] Graham's multiple assignments under Sherman Kent's tutelage at ONE made him familiar with the challenges of determining and conveying analytic uncertainty. Indeed Kent took note of Graham's decision to commit his agency to the use of his estimative vocabulary:

> *The most willing followers of my recommended vocabulary were our military colleagues. Years later when the DIA reorganized its estimates work under General Daniel Graham, my table of values was printed on the inside cover of DIA estimates and the vocabulary rigorously used in the substance of the document.*[35]

Graham received additional exposure to these ideas when he served as chief of the PRG and then as D/DCI/IC from May 1973 through September 1974.

Although neither of Graham's immediate successors shared his experience as an estimator, both were familiar with the problem of effectively conveying analytic uncertainty. Lt. Gen. Eugene F. Tighe, Jr., served as DIA's deputy director for 14 months before taking over as acting director from January through May 1976.[36] Tighe was also DIA's representative to NSCIC Working Group and had been involved in the discussion of analytic uncertainty. General Wilson was similarly well acquainted with the IC's efforts to appropriately caveat its judgments.

In January 1976 DIA launched the experiment with the objective of achieving "more precise statements of confidence and probability of intelligence judgments."

Following his tour as DIA's deputy director for estimates, Wilson replaced Graham as the D/DCI/IC, serving in that position until he took over DIA in May 1976.[37] In a telephone interview with the author, General Wilson credited Graham with the idea for a DIA experiment, noting that both he and Graham were frustrated with the estimative terms used in most products and agreed that "if the weatherman could use numbers and be more precise," intelligence analysts could do better in this realm as well. He concluded that "if the analyst and estimator could be more precise in their judgments, consumers could have greater confidence in their assessments."[38]

The most important and immediate factor leading to the experiment was the criticism of Deputy Secretary of Defense Ellsworth, who, with Cordesman, had been a vocal critic of the IC's efforts in expressing analytic uncertainty.[b] As noted in the August 1976 *Review of National Intelligence* article describing DIA's uncertainty experiment: "This experiment received its initial impulse from high-level DoD consumers—principally Deputy Secretary Ellsworth—who have repeatedly indicated dissatisfaction with vague language of the 'it is believed…' or 'hostilities possibly will…' character."[39]

In January 1976 DIA launched the experiment with the objective of achieving "more precise statements of confidence and probability of intelligence judgments." The trial run involved the incorporation of both percentages (e.g., 30%, 50%, 90%) and letters (A, B and C) in the texts of selected Defense Intelligence Notices (DINs) and Defense Intelligence Appraisals and some Defense Intelligence Estimates. (See sample on next page.) The percentages reflected the probability that a given judgment was valid; the letters represented the analyst's confidence in the source material: A= high confidence; B = medium; C = Low.[40]

At the end of the trial, 750 DIN readers were asked about the usefulness of the experiment; 128 responses were received from a broad spectrum of DoD consumers. A majority favored the use of quantified expressions of probability, believing that they helped to increase their confidence in the information provided and in DIA's judgment and, in particular, helped to give greater credibility to briefings based on the DIA material.[41] However, there was "little enthusiasm for the alphabetized expressions of confidence in sources" and "the respondents as a group indicated that expressions of uncertainty would be most useful in current intelligence, somewhat less so in estimative intelligence, and of least value in basic intelligence."[42]

Based on the survey results, in July 1976 DIA began to quantify the

a. Graham served in Army's Estimates Office of the Assistant Chief of Staff for Intelligence as a major. He served in the Office of National Estimates from 1963 to 1965 and then again from mid-1968 until January 1970. Graham was DIA's deputy director for estimates through May 1973.

b. General Wilson stressed during my phone interview the important role played by Anthony Cordesman of Ellsworth's staff in pushing for greater precision in the estimates coming from the IC.

Opening page of DIA, *Military Significance of Soviet Developed Facilities in Somalia*, 20 February 1976, DIE SOV 2-76.

SECRET

MILITARY SIGNIFICANCE OF SOVIET DEVELOPED FACILITIES IN SOMALIA (U)

This estimate assesses trends in the establishment of Soviet-developed facilities in Somalia, their future expansion and significance in terms of general Soviet interests in the area, and the probable impact they will have on the Soviet military presence in the area.

SUMMARY AND CONCLUSIONS

A. (S) A July 1974 Treaty of Friendship and Cooperation and other agreements concluded at that time apparently have formed the basis for the expansion of Soviet activities in Somalia. The Soviets have acquired special access rights to Somali facilities, including the strategically located port of Berbera.

B. (S) Despite countervailing external pressures on Somali President Siad, the Soviet presence will almost certainly continue (90 percent chance). We expect construction in Somalia for Soviet Navy use to be concentrated at Berbera, where anticipated expansion may include secure and exclusive military berthing and repair facilities for Soviet naval units separate from the commercial port.

Declassified and available in US Department of State, *Foreign Relations of the United States, 1969–1976*, Vol. E-6, Documents on Africa, 1973–76, Doc. 155.

probability (in percentages) of all major judgments and projections in DINs but dropped the alphabetized evaluation of sources. It also decided to experiment with similar procedures for selected order-of-battle products and Defense Intelligence Estimates.[43] This practice continued at least through August 1977 and probably in some fashion for at least another two years.[44]

The evidence available suggests that some consumers were pleased with the change. A May 1978 OMB report on intelligence production and customer satisfaction noted that Office of Secretary of Defense International Security Affairs customers singled out DIA's "use of quantitative confidence statements" as one element of support worthy of praise.[45]

Beyond the changes in its product lines, DIA also had the Defense Intelligence School and the Intelligence Community's Information Science Center, located in CIA's Office of Training, develop courses for its personnel in the assessment and expression of uncertainty. This training, which covered theory and practice, was intended to provide analysts and supervisors with "greater confidence and consistency in the use of expressions of uncertainty."[46]

A year later the Information Science Center announced a new course called "Statistical Concepts for Analysts and Managers." According to the course description, topics covered included descriptive statistics, combinatorial analysis, probability, confidence interval estimation, hypothesis testing, Bayesian analysis, probability diagram construction, and use of decision trees.[47] A DIA graduate of the course confirmed that the training was geared toward helping analysts and managers apply numerical estimates to their judgments.[48] A CIA graduate of the course agreed with that description but observed that on returning to his office he found no support for the application of anything taught in the program to the political analysis in which he was engaged. That latter reaction would be a harbinger of the experiment's future.[49]

Why Did It End?

Although the definitive answer has yet to emerge from the archives, among the most important factors bringing the experiment to an end was the departure of officials who had pushed strongly for greater precision in conveying analytic uncertainty. The abolishment of the NSCIC in 1976 and the departure of critical consumers and leaders like Ellsworth in January 1977 and General Wilson seven months later undoubtedly reduced the impetus for and receptivity to such efforts.[50]

In fact, consumer surveys and IC studies conducted at the time suggested that many consumers did not

consider the use of numeric probabilities a critical issue. According to an April 1977 Center for the Study of Intelligence monograph—based on interviews with 97 consumers and producers—there

> *did not appear to be much concern with the present style of estimative writing, or with the lack of some explicit scale of probabilities. The use of traditional expressions such as "probably," "likely," and so forth seemed satisfactory, though they admittedly do not convey the same meaning to all readers.*

The study concluded:

> *The experimental efforts to provide explicit quantitative rating scales for probability apparently have not struck any very responsive chord with users. They were never mentioned as examples to be emulated.*[51]

The challenges associated with quantifying uncertainty also may have contributed to DIA's decision and the reluctance in the IC to regularly employ numeric probabilities. General Tighe, DIA's director from September 1977 to August 1981, likely spoke for many when commenting about a paper on the explicit expression of uncertainties prepared for the NSCIC in 1975, he expressed his skepticism that "it could be done or would be useful."[52]

Don Mathis, a DIA analyst who produced DINs during this period, voiced similar sentiments, acknowledging that "putting percentages on judgments did not always work well." Mathis attributed this to insufficient training in some cases and the failure to consistently track the accuracy of analytic judgments, an element essential to providing valid probability or confidence assessments.[53]

Others were concerned that the use of percentages and "over-reliance on new techniques" in writing estimates might imply greater precision in judgments than the facts warranted."[54] Several analysts involved in DIA's experiment warned that "the statement of percentages could convey to at least some readers a degree of precision not justified by the data at hand or the subjective nature of an analyst's 'hunch' regarding future events."[55] Similarly, even Bayesian advocates acknowledged: "An ever-present danger, however, is the tendency to attribute more precision to the numbers than is warranted, and it should be stressed that the numbers are always only approximations."[56]

Finally, the IC was preoccupied with issues other than analytic uncertainty in the late 1970s. Its agenda during this period was dominated by fallout from the Church and Pike Committee hearings and budget cuts. These same years witnessed a rash of foreign policy crises—from the collapse of South Vietnam, growing unrest in Eastern Europe and turmoil in Iran to the Soviet invasion of Afghanistan—all of which further distracted the IC from analytic tradecraft issues.

Expressing Uncertainty in the Ensuing Decades

The end of the experiment neither ended the debate within the IC nor consumer demand for better expressions of probability. For example, in December 1978, DCI Stansfield Turner sent a memorandum to the CIA's Deputy Director for National Foreign Assessment—the CIA/DDI's name during part of the Carter administration—addressing an academic's recommendation to introduce probabilities into NIEs. Turner wrote that he and the deputy director needed to convey that "we're trying to bring out uncertainties as much as produce categoric predictions if we force the use of probabilities no matter how subjective."[57]

Four years later the national intelligence officer (NIO) for general purpose forces sent a copy of Sherman Kent's 1964 article "Words of Estimative Probability" to the chairman of the National Intelligence Council (NIC) that he had cited at a NIC staff meeting. In the cover note the NIO remarked,

> *The charts on page 55* [reproduced below] *and* [page] *59 came for a time to represent general guidance for drafters and negotiators of estimates. My impression is that the "poets" have returned to the ascendancy in the estimates business in more recent years,*

100 % Certainty			
General Area of Possibility	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			

leaving their "mathematician" colleagues in the shade.

The NIO, however, concluded by citing a DIA publication that demonstrated that "quantification remains a popular art."[58]

Some organizations and topics seemed more amenable to quantifying probabilities than others. The July 1983 NIE, *The Soviet Space Program*, is a case in point. In its scope note, the NIE warned consumers that "we have judged the likelihood of various Soviet space developments as ranging from very low to very high." The note went on to explain that these judgments would be stated in terms of probability of occurrence and would be done in accordance with a five-step scale ranging from "Very Low = less than 10 percent" to "Very high = more than 90 percent."[59]

Most assessments in the 1990s continued to employ estimative language to address analytic uncertainty, but several used "bettor's odds" or percentages to express the probability or likelihood of a key judgment. At least four NIEs between 1992 and 1994, including high-profile products on Croatia, Iraq, and Russia, conveyed key judgments with such odds.[60]

The 9/11 attacks and the IC's failure to correctly assess weapons of mass destruction in Iraq two years later re-energized the issue of expressing analytic uncertainty. The WMD Commission's March 2005 report made clear that the IC needed to do better in this area. In finding 6, the report cited the failure of analysts to "adequately state the basis for or the assumptions underlying their most critical judgments" concluding that "this analytic shortcoming is one that we have seen in our other studies as well, such as Iraq, and it points to the need to develop routine analytic practices for quantifying uncertainty and managing limited collection."[61]

What We Mean When We Say: An Explanation of Estimative Language

We use phrases such as *we judge, we assess,* and *we estimate*—and probabilistic terms such as *probably* and *likely*—to convey analytical assessments and judgments. Such statements are not facts, proof, or knowledge. These assessments and judgments generally are based on collected information, which often is incomplete or fragmentary. Some assessments are built on previous judgments. In all cases, assessments and judgments are not intended to imply that we have "proof" that shows something to be a fact or that definitively links two items or issues.

In addition to conveying judgments rather than certainty, our estimative language also often conveys 1) our assessed likelihood or probability of an event; and 2) the level of confidence we ascribe to the judgment.

Estimates of Likelihood. Because analytical judgments are not certain, we use probabilistic language to reflect the Community's estimates of the likelihood of developments or events. Terms such as *probably*, *likely, very likely,* or *almost certainly* indicate a greater than even chance. The terms *unlikely* and *remote* indicate a less than even chance that an event will occur; they do not imply that an event will not occur. A term such as *might* reflects situations in which we are unable to assess the likelihood, generally because relevant information is unavailable, sketchy, or fragmented. Terms such as *we cannot dismiss, we cannot rule out,* or *we cannot discount* reflect an unlikely, improbable, or remote event whose consequences are such that it warrants mentioning. The chart provides a rough idea of the relationship of some of these terms to each other.

Remote	Very Unlikely	Unlikely	Even chance	Probably Likely	Very Likely	Almost certainly

Confidence in Assessments. Our assessments and estimates are supported by information that varies in scope, quality and sourcing. Consequently, we ascribe *high*, *moderate*, or *low* levels of confidence to our assessments, as follows:

- *High confidence* generally indicates that our judgments are based on high-quality information, and/or that the nature of the issue makes it possible to render a solid judgment. A "high confidence" judgment is not a fact or a certainty, however, and such judgments still carry a risk of being wrong.
- *Moderate confidence* generally means that the information is credibly sourced and plausible but not of sufficient quality or corroborated sufficiently to warrant a higher level of confidence.
- *Low confidence* generally means that the information's credibility and/or plausibility is questionable, or that the information is too fragmented or poorly corroborated to make solid analytic inferences, or that we have significant concerns or problems with the sources.

Soon after the NIC began including in estimates the now well-known *What We Mean When We Say* textbox (above), which explains the paper's estimative language.

Calls for change came from elsewhere within and outside the IC. Steven Rieber, in a paper titled "Communicating Uncertainty in Intelligence" presented at the 2006 annual meeting of the International Studies Association, provided an insightful look at the community's struggle with the problem. His examination pointed out that despite sporadic attempts at standardization, the IC had never reached agreement and thus the problem of how to minimize or eliminate miscommunication in intelligence products remained unsolved.[62]

Rieber's proposals received further attention within the ODNI's Office of Analytic Integrity & Standards in 2007 and 2008, when standards for assigning uncertainty were drafted but ultimately were never approved for IC policy. The 2011 National Research Council Report for the Director of National Intelligence on ways to improve US intelligence analysis drew additional attention to how analytic uncertainty should be conveyed. The report recommended that the IC routinely evaluate the performance of its analytic methods, urging it to "attach whenever possible numeric probabilities with uncertainty

estimates for the events that analysts assess and forecast." Continuing, the report warned

> *Without explicit quantifiers, analysts cannot communicate their conclusions clearly or evaluate the accuracy of their analyses over time. Policymakers need to know how confident analysts are and how well they understand the limits to their knowledge.*[63]

Partially in response to these kinds of pressures, the ODNI launched in 2010 an experimental "prediction market," both to engage a wider range of analysts and to test the utility of a system that offers a kind of precision in estimative outcomes.[64]

Lessons for Today

The historical record shows that effectively conveying analytic uncertainty has always been difficult. Many of the challenges faced by the ODNI staff and IC members remain largely unchanged four decades later. Lack of agreement on the meaning of estimative terms and debate over whether words or numeric probabilities are the best way to express analytic uncertainty continue within the IC. Even the arguments for and against quantifying the likelihood associated with judgments are virtually the same. To use Sherman Kent's characterization of competing camps, the "poets" continue to warn of conveying false precision while the "mathematicians" stress the clarity in using numeric probabilities.

The NSCIC's vigorous examination of how best to convey analytic uncertainty and DIA's experiment with numeric probabilities also suggest that the manner in which analytic uncertainty is conveyed should be flexible, driven by the nature of issues addressed, the types of judgments advanced, and consumer requirements and preferences. The historical record as well as recent doctrinal publications demonstrate that, in general, DoD intelligence consumers are more supportive of efforts to convey estimates of analytic uncertainty in numeric terms than are other consumers of intelligence.[65] At the same time the experience of the 1970s highlights the need for a common and intuitively clear lexicon for the IC products. The NIC's *What We Mean When We Say* has served NIE consumers well since its introduction in 2005.

Ultimately the IC's experience of the 1970s reminds us there are no "silver bullets" or one-size-fits-all solutions.

The ODNI is now revising ICD 203 (*Analytic Standards)*. A major element of the revision addresses expression of analytic uncertainty. ODNI has proposed to incorporate a "likelihood" spectrum in the revised ICD that would include the option to use numeric probabilities or commensurate estimative language. This adaptation of Sherman Kent's probabilities table (page 37) would provide an IC-wide lexicon and the flexibility to address varied requirements and consumer preferences.[66]

DIA's experiment and interest in and use of Bayesian analysis in the 1970s also reinforces the point that structured analytic techniques can help, but they are not a panacea nor are they appropriate or desired in every instance. Thus, application of methods like prediction markets should be supported, but they are only one part of what should be a larger IC effort to better express analytic uncertainty.

Ultimately the IC's experience of the 1970s reminds us there are no "silver bullets" or one-size-fits-all solutions. As the IC Staff advised General Wilson in October 1975, the "D/DCI/IC should promise to keep at the problem, but warn the Working Group that there will never be a single, perfect key to fit all types of intelligence products."[67]

Still, certain verities continue to hold true:

- The IC has a responsibility to continuously seek better ways to convey analytic uncertainties and their bases.
- "Poets" and "mathematicians" can argue about estimative expressions, but identifying the bases for judgments and the underlying uncertainties is most important.
- Tradecraft, including the identification and evaluation of basic assumptions, the assessment of the nature and quality of sources, and the search for alternative hypotheses, must not be overlooked.

IC analysts may never be able to convey all their judgments with the precision of weather forecasters, but current consideration of revisions to ICD 203 provide an opportunity to bring Sherman Kent's vision of uniform, clearly understood means of expressing estimative probability to fruition and improve the IC's ability to accurately convey its analytic judgments.

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Endnotes

1. *Wikipedia*, http://en.wikipedia.org/wiki/Analytic_confidence.
2. John Helgerson, "Intelligence Support for Richard M. Nixon: A Difficult Relationship," *Studies in Intelligence* 39, No.4 (1995): 103, 110; Robert M. Hathaway and Russell Jack Smith, *Richard Helms: As Director of Central Intelligence, 1966–1973* (Center for the Study of Intelligence, 1993), 8–13.
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49. Andres Vaart e-mail to author, 29 November 2014.
50. Ellsworth served as assistant secretary of defense for international security affairs from 1974 to 1975, and was nominated by President Ford to become deputy secretary of defense, a post he held until January 1977. General Wilson retired in August 1977.
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