Survey Research
(and some additional ideas)

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Total Economic Value

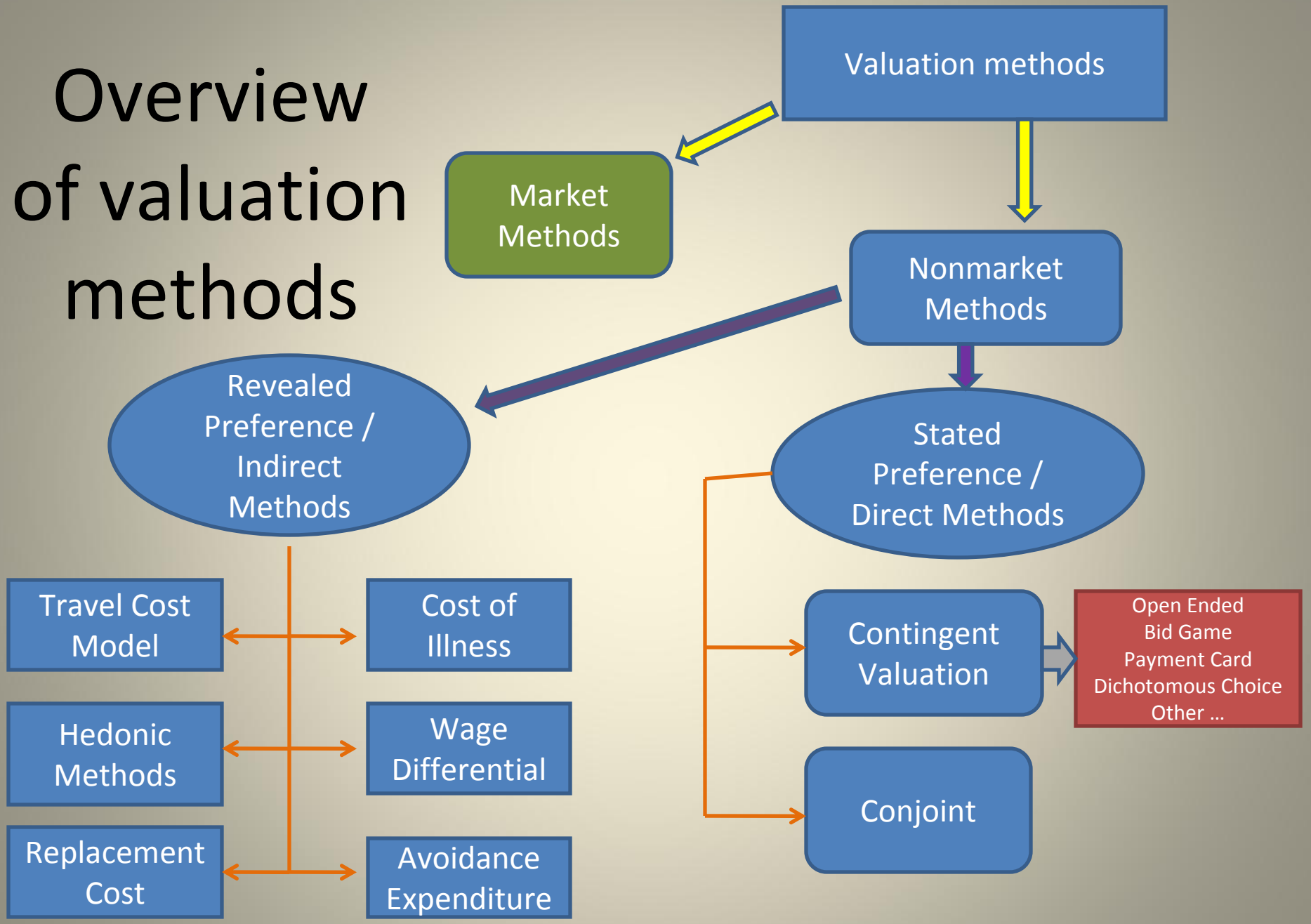
- **Use values**
  - Direct use (timber, other forest products)
  - Indirect use (ecological functions)
  - Option value (WTP to conserve for future use)

- **Non-use values**
  - Existence value (WTP to know an asset exists)
  - Bequest value (WTP to pass on asset to next generation)

- **Total Economic Value =**

  Direct Use + Indirect Use + Option + Existence + Bequest

Overview of valuation methods



Components of economic benefit assessment

- Theory
- Methods
  - Market vs. non-market
- Application
  - decision structure
    - Contingent valuation versus Conjoint
    - DC vs OE
- Analysis
  - econometric model
- Survey
  - questionnaire
  - sampling

Survey Research

What is survey research?

Why survey research?

- only way to get the necessary data.

Considerations in survey research

- what information do I need?
- what will I do with the information?
- how will I analyze the information?
- how and to whom will I present the results?

Survey Research

Advantages

- Efficient for large amount of data collection
- Flexible to collect wide range of information (e.g., attitudes, values, beliefs, past behaviors)
- Relatively easy and inexpensive to administer

Disadvantages

- Difficult with populations with poor literacy and hard-to-reach populations
- Subjects' motivation, memory, and ability to respond
- Not appropriate for studying complex social phenomena
- Low response rates

Research process

- Design
- Sampling
- Implementation
- Analysis

Survey design

- Parts of a survey
  - Introduction
  - Filtering questions
  - Core questions
  - Socio-demographic questions
  - Debriefing questions
- Other considerations
  - Instructions
  - Formatting

Question structure

- Open-ended
- Close-ended with ordered response categories (like scalar categories)
- Close-ended with unordered categories
- Partially close-ended
- With “Other (please specify)_____” option

Principles for writing questions

- Choose simple over specialized words
- Avoid vague questions
- Avoid specificity that exceeds the respondent's potential for having an accurate, ready-made answer
- Avoid biases from "leading" wording
- Response categories should be mutually exclusive
- Avoid asking respondents to say yes in order to mean no
- Avoid asking respondents to make unnecessary calculations

Pretesting

- Review by knowledgeable colleagues
- Evaluate cognitive and motivational qualities
- Small pilot study
  - 10% of final sample size

Example

- I watch television or listen to the radio to get a weather forecast so that I can know what to expect

	Never	Seldom	Sometimes	Usually	Always
I watch television or listen to the radio to get a weather forecast so that I can know what to expect	**1**	**2**	**3**	**4**	**5**

- I have a plan for keeping myself and my family safe in a tornado.
  - Yes
  - No

Survey sampling

- Population, Units, Subjects and Samples
  - Population: entire group of people about which information wanted.
  - Units/subjects: Individual members of the population are called units
  - Sample: part of population examined
- Error
  - Sampling: not surveying all elements of population
  - Coverage: not allowing all members of the survey population to have an equal or nonzero chance of being sampled

Survey implementation

- Methods for survey implementation
  - Telephone
  - In-person
  - Mail
  - Internet
- Mixed mode (e.g., telephone/mail)

Analysis

- Univariate analysis
  - Histograms, tables, charts, etc.
  - Mean, median, mode
  - Range, standard deviation
- Bivariate analysis
  - Crosstab/contingency tables
  - Correlations (Pearson's r, Spearman's rho, phi, Cramers V)
- Regression analysis
  - Logistic, ordinal, linear, etc.
- So much more

Final thoughts

- Ghana meningitis survey
- Many rules
- Many resources
- Beg, borrow, and steal
- NO such thing as a perfect study, survey, or sample!

Resources

- Dillman, D.A. 1999. Mail and Internet Surveys: The Tailored Design Method, 2nd Ed. John Wiley Company, New York: NY
- Krueger, R. A. and M.A. Casey. 2000. Focus Groups: A Practical Guide for Applied Research. SAGE Publications
- Presser, S., J. Rothgeb, M. Couper, J. Lessler, E. Martin, J. Martin, and E. Singer. 2004. Methods for Testing and Evaluating Survey Questionnaires. New York: Wiley and Sons
- Tourangeau, R., Rips, L.J., and Rasinski, K. 2000. The Psychology of Survey Responses. Cambridge University Press.
- http://www2.chass.ncsu.edu/garson/pa765/survey.htm
- http://srcweb.berkeley.edu/index.html
- http://www.jpsm.umd.edu/jpsm/index.htm
- EACH OTHER!!

Communication of forecasts

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Overview

- Communicating uncertainty in weather forecasts: Results from a survey of U.S. public by Rebecca Morss, Jeff Lazo, and Julie Demuth

Motivation

- Weather forecasting community wants to provide useful weather forecasts and communicate forecast information effectively
- Need to understand users' forecast information needs, perceptions, interpretations, preferences and uses
- Audience for NWS forecasts includes intermediaries, specific user groups and public (NWS mission statement)

Motivation

- Weather forecasts are inherently uncertain and many users realize forecasts are imperfect
  - but most current weather forecast information provided to the public is deterministic
- There is an interest in providing uncertainty information
  - but it is challenging to do so effectively

Problem

- There are gaps between forecasts generated and those received and used:
  - End users understand forecasts differently
  - End users use forecasts differently

Questions to answer

- How do people perceive and interpret forecasts?
- How do people use forecasts?
- How can we improve and communicate forecasts in ways that benefit interpretation and use?

Study objectives:

- To help the meteorological community in effectively proving weather forecast information including uncertainty
  - by building empirical knowledge about what people think, want, use, etc.
  - starting with fundamental questions, "everyday" weather
- This understanding can help guide future work, aid user-oriented product development efforts

Study design and data

- Nationwide survey of U.S. households implemented on Internet in November 2006
- Controlled-access, web-based implementation, with respondents provided by survey sampling company
- Analysis based on 1465 respondents
- Respondent population is geographically diverse and similar to US public, but older and more educated.

Survey questions

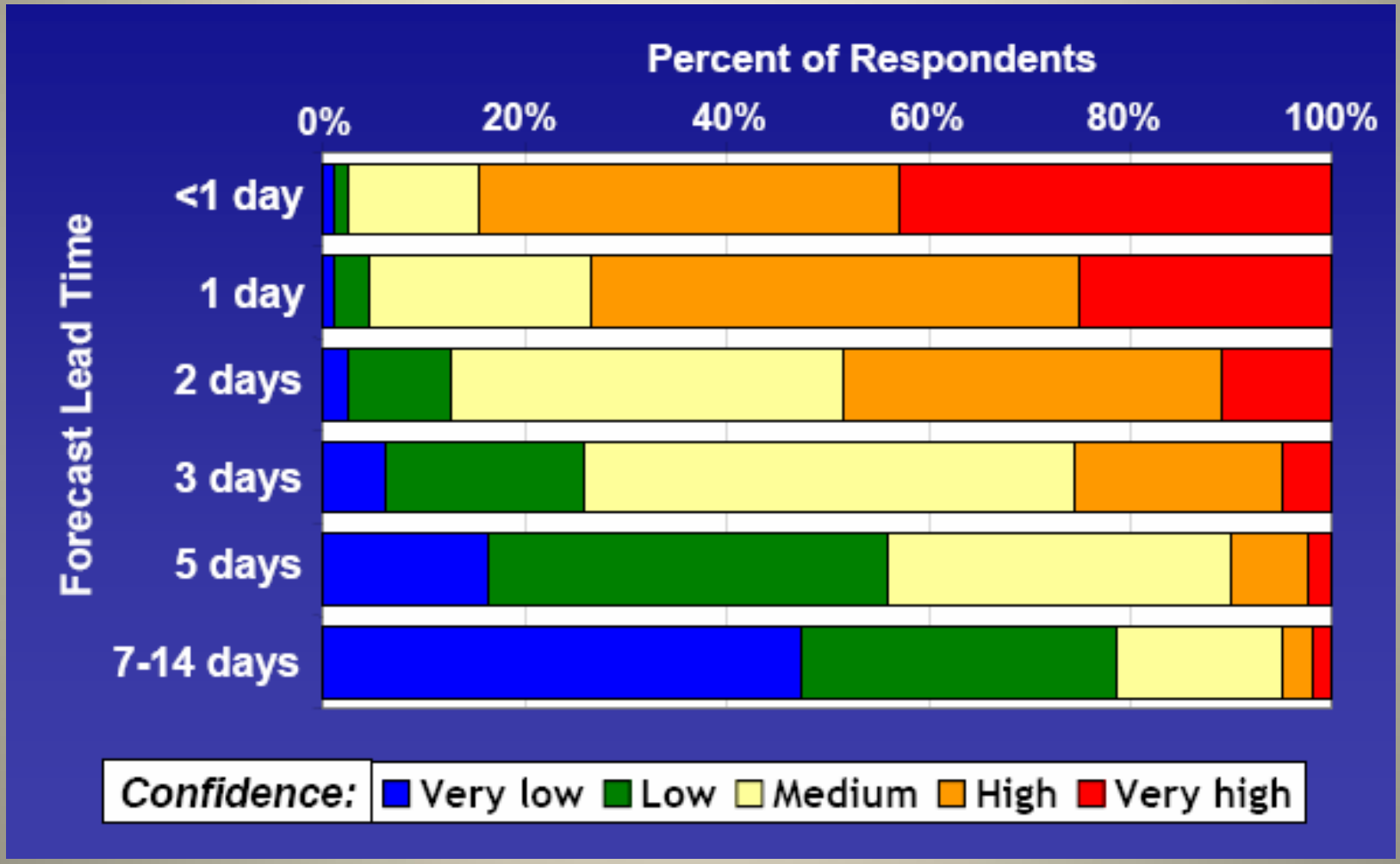
- Sources, perceptions, uses, and value of weather forecasts
- Perception, interpretation, and preferences for weather forecast information
- "Weather salience" (A. Stewart)
- Demographics

Research questions about uncertainty

- Perception:
  - Do people infer uncertainty into deterministic forecast? how much?
  - How much confidence do people have in different types of forecast?
- Interpretation:
  - How do people interpret a type of uncertainty forecast that is already available?
- Preferences:
  - To what extent do people prefer to receive deterministic forecasts vs. those with uncertainty?
  - In what formats do people prefer to receive forecast uncertainty information?

Results. Perception.

- Confidence in forecasts



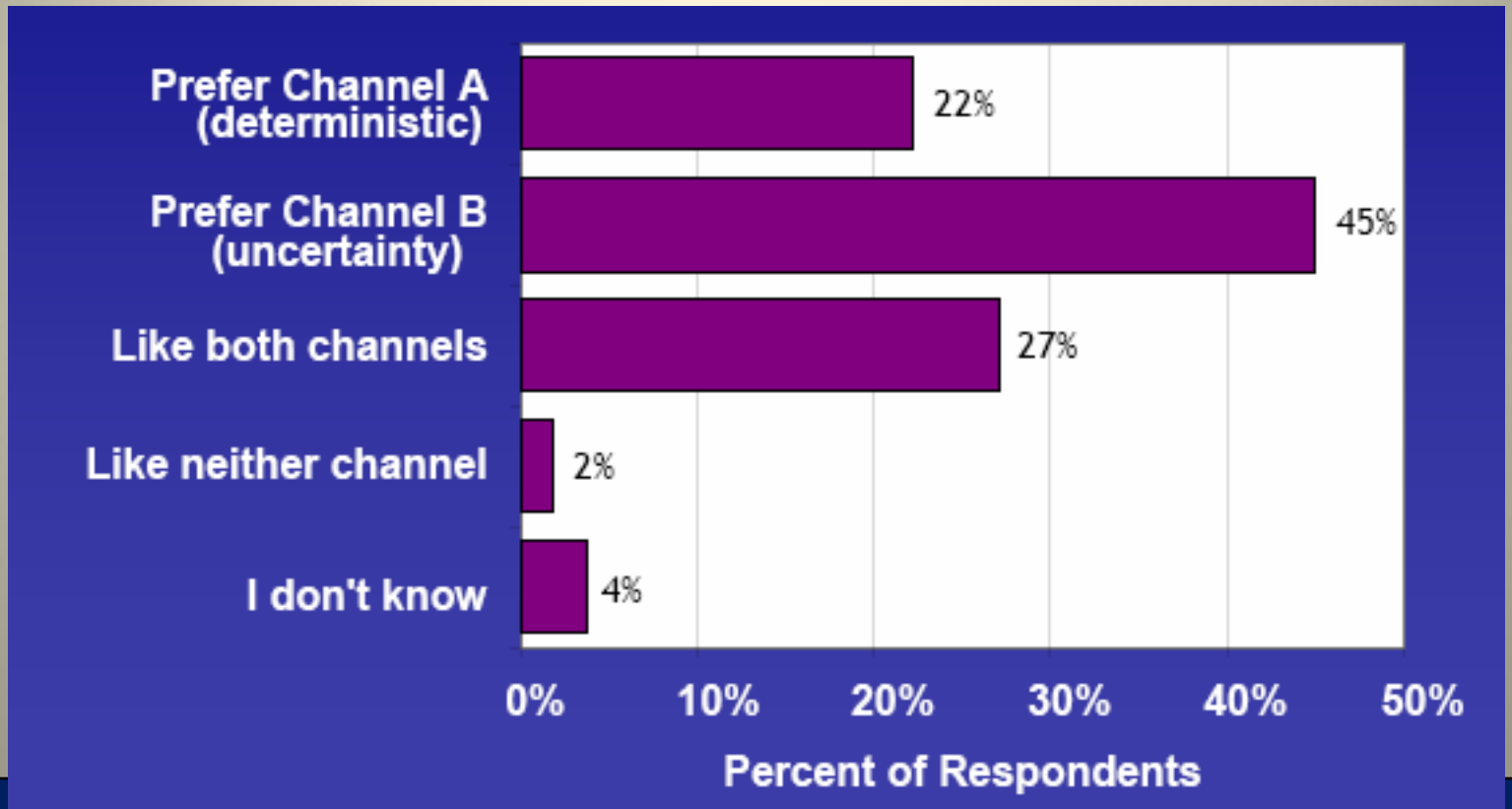
Results. Interpretations.

- Which option describes the statement "There is a 60% chance of rain tomorrow" the best?

Response option (N=1330)	Percent of respondents
It will rain tomorrow in 60% of the region.	16%
It will rain tomorrow for 60% of the time.	10%
It will rain on 60% of the days like tomorrow.*	19%
60% of weather forecasters believe that it will rain tomorrow.	23%
I don't know.	9%
Other (please explain)	24%

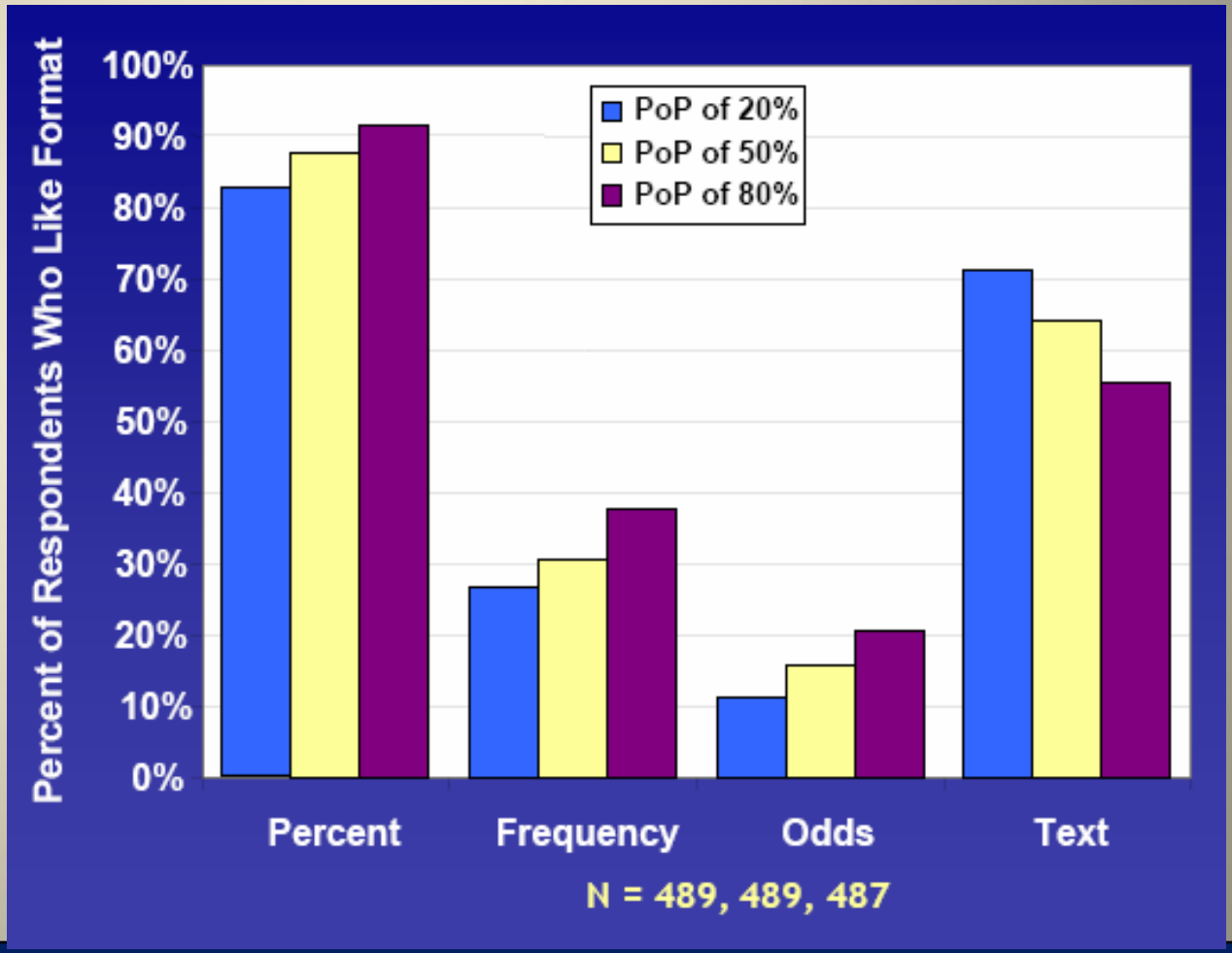
Results. Preferences.

- Channel A states "High temperature tomorrow is 76F"
- Channel B states "High temperature tomorrow between 74 and 78"
- Would you prefer channel A or channel B?



Results. Preferences.

- Which format of forecast would you prefer?
  - percent
  - frequency
  - text
  - odds



Summary

- Most people think weather forecasts are uncertain
- Most people have some understanding of relative uncertainty in forecasts
  - Most people don't know the technical definition of PopP, but
  - It is important to many people
- People have built sufficient understanding of PoP through experience?
- Majority of people like uncertainty forecast information and many prefer it
- Need to understand people's communication preferences

Implications for communication

- Explicit communication of everyday weather forecast uncertainty
  - may not reduce forecasters' credibility
  - is desired by some and acceptable to many
  - may augment people's general notions of forecast uncertainty with situation-specific information
- Ask not whether people understand uncertainty forecast information precisely, but whether they can interpret it well enough to find it useful?