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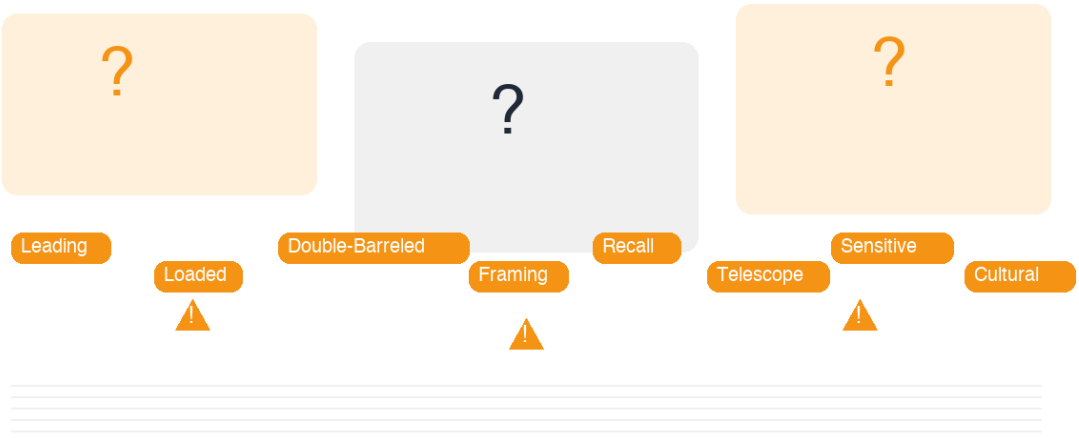
The Complete Guide to Question Bias

48 Types Every Researcher Must Know

A practical reference for designing unbiased surveys, interviews, and questionnaires. Based on the landmark NIH research by Choi & Pak (2005), adapted for modern voice interview and survey design.

> *"Bias is a deviation of results or inferences from the truth, or processes leading to such a deviation." Understanding the 48 types of question bias is the first step to eliminating them.*



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#1 Introduction: Why Bias Matters

Did you know that the Likert scale was invented in 1932, and never changed much since?

Surveys and interviews are the backbone of market research, customer feedback, and public health studies. But the data they produce is only as good as the questions that generate it. A biased question does not just produce slightly skewed data; it can produce data that leads to entirely wrong conclusions.

In 2005, researchers Bernard Choi and Anita Pak published a landmark catalog of 48 distinct bias types that can compromise questionnaire data. Their work, published through the National Institutes of Health, remains the most comprehensive taxonomy of question bias ever assembled.

This whitepaper adapts their research into a practical reference for modern researchers, marketers, and product teams. Whether you are designing a traditional survey or a voice interview with AI, these 48 bias types are the pitfalls you need to avoid.

> *Questionnaire bias results from unanticipated communication barriers between investigators and respondents, yielding inaccurate results.*

The Three Sources of Bias

Choi and Pak organized all 48 bias types into three categories based on where the bias originates:

1. Question Design

How individual questions are worded, scaled, and structured. 24 bias types fall in this category, making it the largest source of bias.

2. Questionnaire Design

How questions are formatted, ordered, and organized as a whole. 6 bias types relate to the overall questionnaire structure.

3. Administration

How the questionnaire is delivered and completed. 18 bias types arise from interviewer behavior, respondent psychology, and cultural factors.

#2 Question Design Biases: Wording Problems

The way a question is worded has the single biggest impact on whether respondents understand it correctly and answer honestly. Seven bias types fall under wording problems.

Ambiguous Question

Questions that can be interpreted in more than one way.

Example:

"Is your work made more difficult because you are expecting a baby?" A "no" could mean "I'm not pregnant" or "my work isn't harder."

Complex Question

Questions that are too long, use double negatives, or have convoluted structures.

Example:

"Has it happened to you that over a long period of time, when you neither practiced abstinence, nor used birth control, you did not conceive?" Too vague, too formal, too complex.

Double-Barreled Question

Questions that ask two things at once, making it impossible to know which part was answered.

Example:

"Do you agree that AIDS can be transmitted by shaking hands or through other physical contact?" A "no" could refer to either or both.

Short Question

Questions that are too abrupt, providing insufficient context for accurate recall.

Example:

"Have you had bad sore throats?" is answered less accurately than a version with a brief preamble providing context.

Technical Jargon

Questions using specialized terms the general population may not understand.

Example:

"What was your age at menarche?" should be "What was your age when your menstrual periods started?"

Uncommon Words

Using formal or complex words when simpler alternatives exist. "Effectuate" instead of "cause," "elucidate" instead of "explain," "utilize" instead of "use."

Example:

Replace: assist with help, consider with think, require with need, sufficient with enough, terminate with end.

Vague Words

Questions with undefined terms that mean different things to different people.

Example:

"How often do you exercise? Regularly / Occasionally" is vague. Better: "Twice a week or more / Once a week / Less than once a week."

#3 Question Design Biases: Missing Data & Faulty Scales

Missing or Inadequate Data

Even well-worded questions can produce unusable data if they collect the wrong type of information for the research objective.

Belief vs. Behavior

Questions about beliefs produce different answers than questions about actual behavior. 96% said chest X-rays are a good idea, but only 54% had actually gotten one.

Fix: Decide whether you need belief data or behavior data, and design the question accordingly.

Starting Time

"In the last 12 months" varies by interview date. Use fixed dates: "From January 1 to December 31 of last year."

Fix: Failure to anchor time periods makes incidence rates incomparable.

Data Degradation

"What is your birth date?" captures precise data. "What age category do you belong to?" degrades it irreversibly.

Fix: Collect data at the highest resolution possible; you can always group it later.

Insensitive Measure

A 1-to-3 scale cannot detect meaningful differences. A 1-to-10 scale provides better discrimination.

Fix: When scales are too coarse, real differences become invisible.

Faulty Scales

Scale design errors force respondents into inaccurate answers even when they want to be truthful.

Forced Choice	Missing 'Don't Know' or 'Not Applicable' options forces uninformed respondents to guess.
Missing Interval	Gaps between response options (e.g., no option between 'once a month' and 'once a week') leave respondents stranded.
Overlapping Interval	Categories like '5 or less' and '5-25' create confusion for respondents at the boundaries.
Scale Format	Odd-numbered scales allow neutral midpoints; even-numbered scales force a side. Neither is inherently better, but mixing them in one study creates inconsistency.

#4 Question Design Biases: Leading Questions & Intrusiveness

Leading Questions

Framing Bias

How options are presented changes choices. Patients prefer 'an operation where 90% survive' over 'an operation with 5% mortality,' even though the first is actually worse (10% mortality).

Fix: Present options with equivalent framing, or use raw numbers.

Leading Question

"Do you do physical exercise, such as cycling?" directs focus to cycling. "Don't you agree that...?" pushes toward agreement.

Fix: Use neutral phrasing: "Do you agree or disagree that...?" or simply "How would you describe...?"

Mind-Set Bias

When question format suddenly changes mid-survey (e.g., 'per week' shifts to 'per month'), respondents on autopilot give wrong answers.

Fix: Keep consistent formats throughout the questionnaire.

> *Different wording of the same question can guide respondents toward entirely different answers. Even small phrasing changes can substantially change response distributions.*

Intrusiveness & Sensitive Topics

Some questions touch on topics respondents find embarrassing, threatening, or private. Badly handled sensitive questions produce refusals or dishonest answers, and can poison the rest of the survey.

Reporting Bias: Respondents selectively suppress information about stigmatized behaviors. A deliberate preamble normalizing the behavior ('People practice many different activities...') can reduce this.

Sensitive Question Bias: Direct questions like "How old are you?" get high refusal rates. "In what year were you born?" gets accurate answers. Indirect approaches outperform direct ones on sensitive topics.

Inconsistency Biases

Four types of inconsistency can make data incomparable across time or geography: **Case Definition** changes (different diagnostic criteria), **Change of Scale** (4-point to 5-point), **Change of Wording** (same intent, different phrasing), and **Diagnostic Vogue** (different labels for the same condition in different regions).

#5 Questionnaire Design Biases

Even if every individual question is well-designed, the questionnaire as a whole can introduce bias through formatting, length, and structure.

Formatting Problems

Horizontal Response Format: Horizontal layouts with poor spacing cause respondents to check the wrong box. Vertical layouts are clearer for listing options.

Juxtaposed Scales: Asking respondents to rate multiple dimensions (importance AND satisfaction) in a single grid causes confusion, especially for less educated respondents. Separate the scales into distinct questions.

Left/Right Alignment: For mailed questionnaires, response choices on the left (before items) are easier to check. For interviews, choices on the right (after items) facilitate data input.

Questionnaire Length

Yes-Saying / No-Saying	Some respondents fall into a pattern of answering 'yes' or 'no' to everything. Mix positive and negative statements to break the pattern.
Open-Ended Overload	Open-ended questions produce rich data but are tiring. Too many in a row causes dropout. Use them strategically, not as filler.
Response Fatigue	Personal interviews: 50-90 min max. Phone: 30-60 min. Self-administered: 10-20 min. Beyond these limits, answers become uniform and unreliable.

Flawed Structure

Skipping Question Bias: Logical flow errors in skip patterns can accidentally exclude entire populations from important questions. Example: branching non-self-employed respondents past smoking questions means you never collect their smoking data. Always pretest skip logic thoroughly.

> *Lengthy questionnaires induce respondent fatigue. Toward the end, respondents tend toward all-yes, all-no, or outright refusals. Strong studies stay short and focused.*

#6 Administration Biases: Interviewer & Respondent

Even with a perfectly designed questionnaire, the way it is administered introduces its own set of biases. These arise from interviewer behavior, respondent psychology, and the dynamics between them.

Interviewer Biases

Interviewer Bias: An interviewer who knows the respondent's health status might unconsciously rephrase "Do you smoke?" as "You don't smoke, do you?" This is a leading question that changes the answer. Proper training and standardized scripts prevent this.

Non-Blinding Bias: When interviewers know the study hypothesis, they may unconsciously probe harder on hypothesis-confirming questions. Keeping interviewers blind to the hypothesis is critical.

Respondent Reaction Biases

End Aversion: Respondents avoid scale extremes, clustering in the middle. This is subconscious; they want to appear moderate.

Faking Bad: Respondents exaggerate symptoms to qualify for benefits, compensation, or attention.

Faking Good (Social Desirability): Respondents give socially acceptable answers rather than truthful ones. Mothers tend to deny smoking during pregnancy even when they did.

Unacceptable Disease: Stigmatized conditions (STDs, mental illness) are systematically underreported. Place these questions late in the survey and consider anonymous formats.

Unacceptable Exposure: Stigmatized behaviors (drug use, unsafe sex) are underreported. Ask about past behavior first (less threatening), then current behavior.

Unacceptability: Measurements requiring excessive effort (e.g., refrigerating urine specimens) produce systematic refusals. Reduce respondent burden.

Underlying Cause (Rumination): People who are sick think harder about possible causes and report higher exposure rates than healthy controls, even when actual exposure is the same.

#7 Administration Biases: Recall, Learning & Culture

Learning Biases

Learning Bias: Earlier questions teach respondents about the study's focus, changing how they answer later questions. Randomizing question order across respondents reduces this effect.

Hypothesis Guessing: When respondents figure out what the study is testing, they alter their answers. A sequence asking about headaches followed by battery exposure makes the connection obvious; respondents with headaches may overreport battery exposure.

Recall Biases

Primacy & Recency: In written surveys, respondents favor early options (primacy). In phone or in-person interviews, they favor the last option heard (recency). Randomize option order to neutralize this.

Proxy Respondent: Having someone answer on behalf of another (a spouse, a caregiver) works for factual questions ('What is your wife's occupation?') but fails for subjective ones ('How afraid is your wife of cancer?').

Recall Bias: People with a condition recall related exposures more vividly than healthy controls. Mothers of children with leukemia remembered prenatal X-rays in greater detail than mothers of healthy children.

Telescope Bias: People remember distant events as more recent than they were. An event from November gets reported as happening in March. Bounded recall procedures (interviewing at the start and end of a period) reduce this.

> *Respondents usually recall distant past events as happening more recently than they actually did. This telescope effect can significantly distort time-based data.*

Cultural Bias

"What is your gross monthly income?" works in Asian cultures where monthly income is the norm, but in North America and Europe, some respondents will report annual income instead. Cultural assumptions embedded in questions produce systematic errors across populations. The only reliable fix is pretesting with representative samples from each target culture.

#8 The Bias Prevention Checklist

Use this checklist before launching any survey or interview study. Each item maps to one or more of the 48 bias types covered in this guide.

- [ ] Each question asks exactly one thing (no double-barreled questions)
- [ ] All questions use plain, everyday language (no jargon, no uncommon words)
- [ ] Questions are free of leading phrasing ('Don't you agree...', 'How much do you love...')
- [ ] No loaded adjectives or emotional words in question text
- [ ] No assumptions or presuppositions embedded in questions
- [ ] Response scales have no gaps, no overlaps, and include 'Don't Know' where appropriate
- [ ] Options are framed equivalently (no framing bias between choices)
- [ ] Sensitive questions are placed late in the survey with normalizing preambles
- [ ] Question format is consistent throughout (no sudden scale or unit changes)
- [ ] The questionnaire is short enough to avoid response fatigue
- [ ] Skip logic has been tested and does not accidentally exclude populations
- [ ] Open-ended questions are used strategically, not as filler
- [ ] Response option order is randomized or counterbalanced to prevent primacy/recency
- [ ] Time references use fixed dates, not vague terms like 'recently'
- [ ] The questionnaire has been pretested with a small sample before launch
- [ ] Interviewers are trained and blind to study hypotheses

#9 The Upshot

The 48 bias types cataloged by Choi and Pak are not obscure edge cases. They show up in real surveys every day: in market research questionnaires, customer feedback forms, employee engagement surveys, and clinical trials. The difference between useful data and misleading data often comes down to whether someone checked for these biases before clicking 'send.'

The good news is that most biases are preventable. The checklist on the previous page covers the most common pitfalls. For voice interviews specifically, the ReadingMinds Academy provides hands-on training in writing voice-first questions that are neutral, clear, and designed to capture authentic emotional responses.

> *The difference between useful data and misleading data often comes down to whether someone checked for bias before clicking send.*

Source & Acknowledgment

This whitepaper is based on: Choi BCK, Pak AWP. "A Catalog of Biases in Questionnaires." *Prev Chronic Dis.* 2005 Jan;2(1):A13. Published by the National Institutes of Health (PMC1323316). We gratefully acknowledge the authors' foundational research.

Resources

ReadingMinds Academy	Free 4-lesson course on writing unbiased voice interview questions. Covers the Voice Question Blueprint, neutral language, and the QA checklist.
Question Bias Checker	Free AI-powered tool that detects bias in your questions and rewrites them using Academy best practices.
Interview Invite Optimizer	Free AI tool that scores your interview invitation email and generates a 3-email invite sequence.
Study Templates	24 ready-to-use interview study templates built on Academy best practices.
Live Test Drive	Experience a 3-minute voice interview with Emma, our AI interviewer. See the emotional signals she detects.

About ReadingMinds.AI

ReadingMinds provides AI voice interviews that detect customer emotions. Emma, our AI interviewer, conducts 3-minute voice conversations that capture hesitation, conviction, trust, and emotional friction in customers' own words and tone of voice. No typing. No scheduling. No permanent recordings stored.

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