

UNITED WISDOM

Probability and frequency: where intuition loses the scale

World and Consciousness

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W-03-N04 · EN

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Epigraph

> *But that supposes the various cases equally possible.*

Laplace, Philosophical Essay on Probabilities, ChapterIII, Second Principle, opening sentence. Truscott/Emory translation; the antecedent is the preceding equal-case count.

What this article is about

Probability can sound like a promise, and frequency can be mistaken for a precise account of the future. Yet “This happened in four of twenty cases” describes selected observations, whereas “The next case has a one-in-five chance” needs additional grounds. This article distinguishes an observed proportion, probability within a specified model, and decisions under uncertainty. Small invented examples involving cards and library books show the importance of denominators, selection, independence, and the direction of a question. Passages from Laplace and Hume clarify the difference between calculating possible outcomes and carrying experience into expectation. Ecclesiastes is considered separately as religious reflection on limits to guaranteed outcomes, without becoming statistical theory. We do not assign an inevitable error or universal psychological mechanism to the reader. The practical aim is to read a numerical claim more precisely and identify which decision it supports, and which confidence has been added beyond the available information.

I. One fifth of what?

Imagine a library where a small meeting had to be rescheduled on four of twenty recorded occasions. This is an invented example. The proportion rescheduled is one fifth of those twenty cases, rather than a property of all library meetings. We must know what entered the twenty: every scheduled event, only completed records, or days for which correspondence survived. If uncompleted meetings vanished from the journal, the observed set would change. A number can be calculated correctly while answering a different question from the one for which it is being used. Arithmetic cannot quietly repair a change in the subject being counted.

Clarify “rescheduled,” too. One participant means a new date; another includes a start delayed by an hour. Choose the meaning before comparing records. Otherwise four cases in one list might become six in another, although both people read the documents carefully. A shared question requires a shared feature and accessible grounds for applying it. Two separate tasks

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can be retained if their difference is identified: changing the date and delaying the start. Their figures cannot simply be placed together and pronounced contradictory. A number does not automatically contain its own definition, and a familiar word does not ensure that everyone counted the same thing.

A useful statement is longer than an isolated percentage: “Among these twenty scheduled meetings, included under this rule during this period, four changed date.” It supplies a proportion and its boundary. Twenty percent can abbreviate it once the boundary is clear. When the number enters another conversation, retain the original explanation as well. Otherwise a listener might hear a statement about every future meeting. Precision is not the number of decimal places but the possibility of recovering what was counted. Four out of twenty can sometimes preserve the material’s scale better than a percentage standing alone, stripped of the number of observations behind it.

II. Probability needs a specified task

For a different question, define an artificial model: six equally available cards numbered one to six. One is randomly selected, returned, and the cards reshuffled before each subsequent draw. A number specified beforehand has probability one sixth on a single draw in this model. This concerns specified possibilities, not a proportion of outcomes already observed. The conditions allow calculation before the first draw. Equal availability, however, does not follow merely from having six labels. It must be a model condition or separately supported for an actual mechanism. Listing outcomes does not establish their equal probability, even when the list is complete and neatly arranged.

At the beginning of Chapter III of the Philosophical Essay on Probabilities, Laplace explicitly qualifies counting by equal possibility. The consulted text is Truscott and Emory’s translation from the identified sixth French edition. We use this bounded mathematical question without adopting the author’s entire historical worldview. Listing a coin’s two large faces is not itself an investigation of its behaviour. Likewise, six cards define our probability model only after the selection conditions have been specified. “We can name six alternatives” does not become “Each has the same chance” without another step. Counting names and supporting chances are distinct operations.

A library’s alternatives can also be listed: a meeting happens, moves, or is cancelled. Three labels do not give each outcome probability one third. They may depend on timetables, rooms, and people’s decisions. The categories may even overlap: a rescheduled meeting is later cancelled. Define the time of assessment and mutually exclusive outcomes first. A good model need not be elaborate, but it must answer the question. Sometimes no suitable model is available yet. Past frequency then remains accessible while the probability of the future case stays open. An attractive fraction obtained from counting words should not close that gap.

Grouping outcomes also changes the impression. “Six” and “any other number” give two names, but they correspond to one and five cards in our set. Their probabilities therefore differ. There are two labels and six possible selections. This small distinction already shows why a verbal division of alternatives needs comparison with the trial’s actual arrangement.

III. Experience does not become expectation automatically

In Section VI of the Enquiry concerning Human Understanding, Hume considers probability and the transfer of previous cases into expectation. When earlier results vary, he asks that the other effects not be overlooked even when one was more frequent. This is philosophical examination of experience and belief, not a contemporary study of library events. It gives us a question: which earlier cases support the expectation, and which differences between them and the current case remain relevant? Four reschedulings may be an important part of experience, yet the count does not show that the next meeting will have the same conditions. That transition needs grounds appropriate to its subject.

Suppose every rescheduling occurred during repairs to one room, and those repairs have ended. The former proportion describes a period with a particular condition. It remains part of history, but using it for the next month needs reconsideration. The reverse situation is possible too: few records exist, yet an available timetable directly reveals a clash between two events. General frequency should not obscure information about an individual case. Ask what is comparable in the experience, what has changed, and what relevant detail disappears when observations are pooled. This article supplies no single formula for every rescheduling, and no guarantee that the most recent proportion will remain unchanged.

An organiser may only be able to say, “The previous record had this proportion; I lack suitable grounds for an exact chance for the next case.” That is a substantive answer rather than a refusal to think. It can be accompanied by an action: check the room, clarify the date, or prepare a way to communicate changes. A decision can accommodate named uncertainty. Historical philosophical questions help distinguish experience from guarantees; they do not replace obtaining present information. Confidence can increase through additional grounds, rather than through repeating the former number more firmly. Acknowledging the transition also makes later revisions easier to explain.

IV. A short series does not distribute outcomes evenly

Return to the cards. If five draws produced no six, the next draw still has probability one sixth in the specified independent model. The card was returned and the selection conditions restored; previous results do not change the set. This does not establish that actual conditions are restored in any real system. Without replacement, the task is different. “Independent” must therefore have content rather than decorate a calculation. It identifies the relevant relationship between draws in our model. The history need not govern the next result merely because we want a more balanced-looking sequence. That desire is not among the conditions defining the next selection.

Six independent draws do not promise one six. None, one, or several are possible. The expected number is one, but this describes a distribution rather than the required result of a single series. To calculate the chance of at least one six, consider the opposite event: six selections of another number. Its probability is the product of six factors of five sixths. The probability of at least one six is one minus that product, and is not one. The calculation explains why six attempts, each with a one-in-six chance, do not guarantee the desired card. Expected count and assured count remain different claims.

This example does not establish that library reschedulings are independent. Moving one meeting can affect another date. A shared cause may affect several events. The card formula retains its own domain. Applying a similar calculation to meetings would require a specified process, dependencies, and appropriate information. Without them, do not multiply percentages merely because multiplication is familiar. Numerical confidence must retain the conditions from which it arose. A simple example can make this limitation especially visible; its simplicity does not authorise transferring it to every real event. Before using a product of probabilities, recover the relevant relation between the events being combined.

V. Reversing the question changes the denominator

An invented book example reveals another distinction. Take an artificial teaching set of one thousand books, twenty with damaged bindings. An imagined system marks sixteen of those twenty and eighty undamaged books. These are constructed counts, not an evaluation of an actual system or a promise of inspection quality. Among damaged books, sixteen of twenty were marked: eighty percent. Among all marked books, sixteen of ninety-six have damaged bindings: one sixth. Both proportions come from the same set, but answer different questions. Neither is a calculation error; the error would be treating them as interchangeable.

The first asks, “Given a damaged book, how often was it marked in this set?” The second asks, “Given a marked book, how often was it damaged?” Both the condition and denominator changed. Eighty percent cannot become the second proportion by reversing the sentence.

Understanding a mark requires counting damaged and undamaged books receiving it. A large undamaged group can contribute many marks even if its own marking proportion is relatively small. The group’s scale belongs to the question; it is not an incidental detail that can be dropped. The complete teaching set makes the transition visible because all the counts have been specified.

For an actual catalogue, first examine the damage definition and how the set was formed. The artificial table nevertheless already reveals the logical difference between the conditions. It gives no indicator for a real library and no instruction about a particular binding. Action might involve inspecting the book or clarifying how a mark is produced. The teaching calculation is useful precisely because of its limits: all counts are available, so the inference can be followed. If the figure enters advice without its question, accurate arithmetic no longer supports the meaning the listener takes from it. Preserve the question alongside the fraction.

VI. A large count does not repair selection

The number of records matters, but first understand which records entered. If only organisers wanting to share successful work answer a question about rescheduling, a thousand replies describe those respondents. They do not automatically describe all libraries. If a list includes only completed meetings, cancellations may disappear before counting starts. Extending that same list cannot simply repair the gap. Another way of constructing the material, or a narrower conclusion, is needed. This article does not assess an unidentified study. It identifies a condition to ask about before treating the size of a number as the extent of its applicability. More observations of the same selected kind do not supply missing kinds.

Identify the observation unit too. One visitor may submit several comments, one meeting appear in two journals, or one message be reproduced in several places. Rows are then not automatically independent cases. Calculating a proportion may require matching records and identifying duplicates. This need not accuse their maker: the material may have served another purpose. A correspondence journal can suit a history of communication without suiting a count of events. Its original function affects the questions it can answer. Moving to a new task requires examining the data’s construction, rather than assuming that each available row supplies one suitable occurrence.

Periods should not be combined thoughtlessly either. Suppose a small group of meetings took place during repairs and another after completion. A pooled proportion describes the mixture but may poorly answer a question about the next post-repair meeting. Dividing the material into ever smaller groups has limits as well: each may contain too little for a strong conclusion. We offer no universal sufficient sample size. That depends on the task and method. The common step is more modest: identify the group, time, and inclusion rule, then show which

part of the present decision the resulting proportion can inform. Clarity about scope precedes confidence about application.

Pooling also needs arithmetic that respects scale. In another artificial set, the first group contains ten meetings and five reschedulings; the second contains ninety meetings and nine reschedulings. Their proportions are fifty and ten percent. The pooled proportion is fourteen out of one hundred, fourteen percent, rather than their unweighted average of thirty percent. Different group sizes contribute different weights to the combined proportion. This is a count within a specified set, not advice to pool any periods. The shared task and comparable definitions still need examination. A correct calculation of a mixture does not prove that the mixture suits the future case under consideration.

VII. Frequency does not contain a cause

If evening meetings change date more often than morning meetings, the difference does not yet establish evening as the cause. Larger events may have been scheduled later, another room used, or guest availability more involved. Even a careful complete record does not automatically choose among these explanations. Seek additional information and comparable conditions, or retain the observed difference without a causal assertion. The distinction does not remove the count’s usefulness: it identifies where a question arose. Describing a distribution does not immediately establish that moving a meeting to the morning would remove the condition responsible for its rescheduling. An intervention adds a question of its own.

The reverse is possible: a specific instruction establishes a relevant condition without a general rescheduling table. If a room closes on a particular date, the closure notice may directly concern the chosen meeting. We need not wait for a large frequency before clarifying the location. Different grounds answer different questions. Observation counts are not the only kind of knowledge; a direct report about a condition can matter independently. Check that it concerns the relevant place and date. Compare available grounds without making a statistical proportion the compulsory replacement for every other piece of information. A number’s authority does not extend beyond the question it answers.

Write two sentences separately in the proposed exercise: “I observe this proportion,” and “I propose this explanation.” Identify the transition between them. If it has not been supported, the explanation remains a proposal. A decision can involve an action that does not require an established cause, such as clarifying a timetable or allowing extra time. Convenience does not prove the causal account. Conversely, uncertainty about a cause need not prevent action supported by information about a particular condition. These distinctions keep the number in a role it can perform, while leaving other grounds and personal choices available for the rest of the decision.

VIII. Expected count and the value of an outcome

A probability does not tell us whether an outcome is desirable or acceptable. Two organisers can understand the same uncertainty and choose differently. One tolerates a changed date; another can attend only that evening. Their disagreement need not involve a calculation error. It may concern consequences for each. First establish whether they read the number alike, then discuss participation conditions. Turning a preference into a claim about the correct probability can conceal the actual question. A person can decline inconvenient uncertainty without proving that the event is almost certain to fail. Respecting the calculation does not require everyone to accept the same arrangement.

The card model’s expected count is one desired result in six draws, but that does not decide whether to undertake the series. The cost of acting, the result’s significance, and acceptable alternatives are needed. They are not contained in one sixth. We propose no monetary strategy or optimal threshold for real risks here. The boundary is enough: describing possible results and evaluating them are distinct parts of a decision. Even an exact calculation does not turn one participant’s preference into everyone’s obligation. A number supports conversation when its role is clear, alongside the values and conditions which it does not determine.

In Ecclesiastes 9:7–12, ability and work stand beside recognition that desired outcomes are not guaranteed. The passage was consulted in the King James Version and retains its religious domain. It establishes neither independent card draws, meeting frequencies, nor an acceptable participation threshold. Our comparison concerns limits to guarantees rather than a shared mathematical theory. It is not used here to conclude that preparation is pointless. Preparation, uncertainty, and the activity’s value can be discussed together without becoming one percentage. A religious question about living and a mathematical question about specified outcomes remain different questions, even when both concern an uncertain future.

IX. Communicating a number without an extra promise

An organiser can provide useful information: four of twenty scheduled meetings changed date in this period; the room is confirmed for the current event, while guests are still being contacted. Past frequency is neither hidden nor made into an exact future probability. Current information is identified. A listener can distinguish what is known from the open part of the decision. The statement may be shortened, but preserve its transitions. “Eighty percent reliable” would leave reliability’s definition, the observation group, and the grounds for applying the figure to this date unclear. A compact phrase can be useful only while its essential boundary remains recoverable.

When using a probability estimate, identify its origin: calculation within a specified model, inference from particular material, or an opinion with insufficient data. These grounds are not

automatically equivalent. They may suit different purposes and require different questions. Do not turn missing information into zero chance, or absence of a guarantee into equal probability for every outcome. Sometimes the numerical estimate has not been made. Say so directly and supply the accessible facts. An honest account of uncertainty helps choose a next step without decorating the gap with false precision. It also prevents a later reader from mistaking an illustrative number for a measured finding.

Both parties can examine the communication. The writer asks whether the material supports the words. The reader asks which conclusion they are adding. “Four reschedulings” can become “Four out of all possible cases” if the boundary disappears. We do not declare this an inevitable human property; it is simply possible within our example. Conversation can clarify it. Correct a specific number, group, or condition when an error is found, and explain the change. The entire earlier record need not become useless because one transition requires amendment. A limited correction can preserve accurate information while removing an unsupported extension of it.

Zero recorded cases especially differs from impossibility. If none of twenty meetings moved, the observed proportion is zero. Without other grounds, this does not establish zero probability for the next rescheduling. In the card model, a number can fail to appear in a finite series despite a specified nonzero chance. That comparison does not make a library into a card model; it distinguishes the claims. Calling a future event impossible needs suitable conditions, beyond absence from a small list. Likewise, one recorded rescheduling does not ensure recurrence. Zero and one in the record retain their subject: how many qualifying cases occurred within that material.

X. Conditions preserve the scale

Frequency retains its relation to an observed set; probability to a specified question and grounds of estimation; a decision to consequences and preferences. These relations can disappear when a sentence becomes one percentage. Restoring conditions does not weaken numerical knowledge. It identifies its actual use. One fifth may accurately describe twenty cases; one sixth may describe the card model, or a different proportion among marked books in an artificial set. An identical fraction need not have an identical basis. Understanding that basis lets us use the number beyond an appealing initial formulation, while keeping the subject and inference available for examination.

Laplace’s selected passage prompts questions about equal possibilities and combined events; Hume’s passage about carrying varied experience into expectation; Ecclesiastes about living without a guaranteed desired outcome. Comparison creates no single doctrine and replaces no modern research method. We used historical questions to develop original small examples. An actual process with substantial consequences needs assessment through appropriate data

and methods. Our exercise prepares a clearer question rather than supplying a ready-made number for every situation. The sources help us identify different tasks; the grounds for a present numerical conclusion must still be found within the relevant task.

After this examination, someone may recalculate a proportion, clarify the case, or leave future probability unestimated. Each can be useful. Complete confidence need not be the ending. Knowing what was calculated, which conditions were assumed, and which action they support may be enough. Scale becomes visible when numerator, denominator, inclusion rule, and inference limits return. A familiar figure then becomes particular knowledge rather than a general promise: something we can discuss, examine, and change when needed. Keeping uncertainty does not discard what is known; it prevents the known part from silently expanding to fill the rest.

What this means in practice

Choose one small numerical claim already affecting a choice. Record it completely. Is it a past proportion, probability in a specified model, or an estimate about the future? For a proportion, identify numerator, denominator, period, and inclusion rule. For a model, identify outcomes and the grounds for equal or differing chances. Do not insert an arbitrary number if those details are unavailable.

Check the direction of the question. The proportion of damaged books marked and the proportion of marked books damaged require different denominators. Separate calculation, causal explanation, and evaluation of the outcome. A single figure does not answer all three. If independence is assumed, identify what supplies it in this task.

Choose one next step: recover the observation group, recalculate a simple proportion, clarify a current condition, or retain probability as unestimated. Record what changed. A serious decision may need appropriate specialist work; this small exercise does not replace it. It is an authorial practice for reading numerical claims, with no promise to improve every decision. You can stop after one clear question without turning everyday life into continuous counting.

Key quotation

> *we must not overlook the other effects*

Clause from Hume’s Enquiry concerning Human Understanding, VI.4, discussion of varied previous effects and their weight in expectation. Displayed original English; explicitly bounded excerpt, not an independent calculation rule.

Connections between traditions

1. **Laplace / Hume:** calculation under specified cases and carrying experience into expectation both concern uncertainty but have different grounds. Philosophical confidence does not replace a mathematical condition.

2. **Laplace / our cards:** equal availability and independence belong to the authors' teaching model. A list of labels or historical authority does not establish them.

3. **Hume / the library record:** varied previous outcomes prompt a question about expectation. Our proportion concerns an invented set; philosophy does not assess an actual library.

4. **Ecclesiastes / the philosophical-mathematical passages:** an unguaranteed outcome permits comparison. Religious living, philosophical expectation and probability calculation retain different subjects.

5. **Three sources / a participant's decision:** distinctions of grounds and guarantees support our discussion. Participation conditions and exercise are authorial; no common proven technique is established.

Primary sources

1. Laplace. Philosophical Essay on Probabilities, selected II–III passages; F. W. Truscott/F. L. Emory, English1902 edition. Bounded calculation-conditions passage read.

2. Hume. Enquiry concerning Human Understanding, VI, §§1–4 and note10; Hume Texts Online English text. Philosophical probability/expectation discussion.

3. Ecclesiastes9:7–12, King James Version. Consulted religious passage on living and unguaranteed outcomes; no statistical theory.

Tags

probability, frequency, scale, proportion, numerator, denominator, model, equal possibility, independence, condition, conditional probability, expectation, experience, Hume, Laplace, Ecclesiastes, cards, library, selection, duplicate record, pooling, cause, uncertainty, zero observations, expected count, guarantee, preference, decision, verification, reading exercise

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