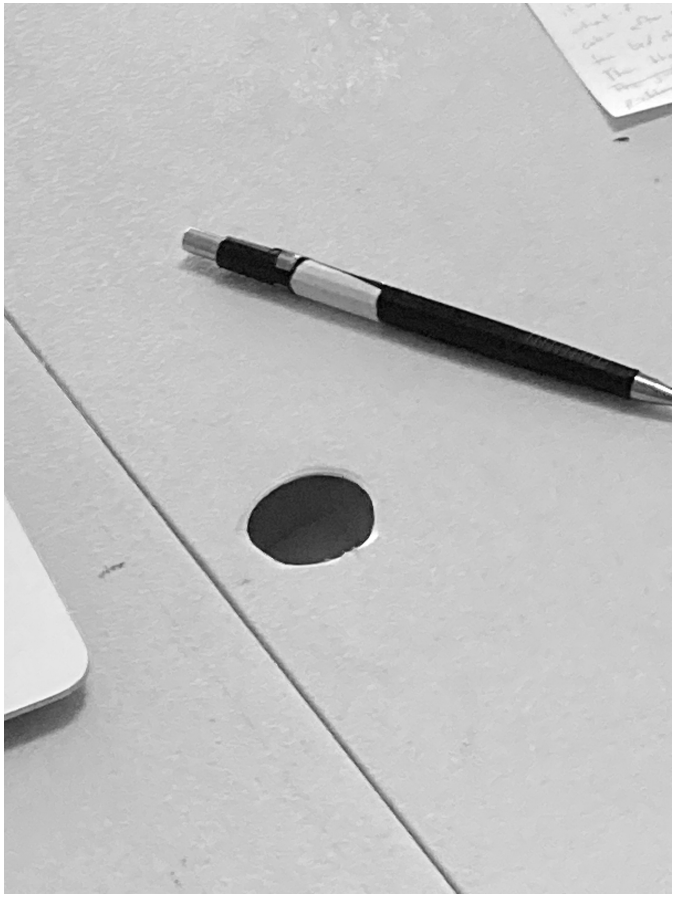

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A Practical Inquiry into the Perception of Coincidence

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Introduction

The ability to recognize coincidence is a standard tool in understanding one's surroundings, and it's employed on a daily basis. Objects relate to one another in some casual way, such as occupying the same place, and they also relate in some unusual way, such as having the same quality.

Example. Two dice are rolled, and they both land on a six.

Their placement is casual because there's no apparent directive that would ensure they're placed in a particular way. It also allows for their comparison by other factors, by which they might relate and inspire the observer to notice. Upon noticing this relation, the observer intuitively seeks other relations the two objects might share, as these relations can be consequential to the observer's interests.

Example. The dice are weighted.

One has an intuition of balance among all the probabilities of events one passes each day. Some events are less likely than others, and the number of unlikely events decreases with how unlikely they are. There should not be too many unlikely events, or else they don't fit in the balance, and somehow they must not be as unlikely as they seem. This intuition is of the Gaussian distribution, or normal distribution. As unlikely events continue to occur, one is forced to reevaluate what is normal and physically possible, and will seriously question *all that is known to be real* before doubting the balance of the probability of events. There is nothing more disturbing than a cluster of absurdly improbable events with no imaginable cause.

The environment that supports such an event appears contrived, and the arrangement of objects appears not so casual after all. The observer may discover some hidden cause that directed the event, or simply disregard the event with the assumption that some cause exists. In either case the event is not so improbable as it appears. As related events continue to occur, it becomes more important to understand their cause, and as explanations fail, wilder theories are taken into consideration, imposing greater environments and more distant causes.

As the improbability of a coincidence continues to increase, or as such events continue to occur, the objects lose importance, and coincidence emerges as an object in its own right. This practical inquiry is a study of that object and its consequences.

accumulation and analysis of many weak coincidences, and their best explanation includes some fudged elements that make it easier to explain. They give the imaginary object something like a human form, but much bigger and smellier, and they call it a troll. The storyteller scopes troll sightings to events that happen more than a day's journey outside the village. The storyteller has a more refined understanding of the imaginary object than their listeners, and in the privacy of their mind, contemplates the imaginary object as a bare collection of real observations. Skeptical listeners discard the stories as rubbish because the troll is not believable. The storyteller is pressed to refine their description of the imaginary object, because they are disturbed by an accumulation of real coincidences that others are not aware of, and cannot be discarded.

Gods Further refinement places more bounds on what would truthfully describe a real manifestation of the cause behind all unexplained coincidences. More sophisticated attempts call it a god, which cannot be seen, and since it cannot be seen, its existence cannot be refuted. The concept is tempting, because whatever power it has to arrange worldly events is certainly not limited to strong coincidences, but could arrange any event, even the most trivial. The postulation of a god, which manifests the imaginary object, comes with this baggage that it may take the blame for any misfortune or questionable decision. This can be especially tempting when more practical explanations aren't the most favorable.

Signs The interpretation of signs is an approach to coincidental events that doesn't depend on whether the pattern is arranged or accidental, and finds parallels to interpret and derive meaning from the events. It's sometimes associated with a belief in the imaginary object, which is invoked to explain the arrangement while waiving rationalization. The interpretation of signs works just as well without such invocations. Even without help from the supernatural, a thoughtful interpretation can yield meaning or guidance.

Example. A tarot reader shuffles a deck of cards, draws some cards from the deck, and arranges them on a table. According to a predefined model, positions in the arrangement map to specific aspects of the querent, such as who they are, where they are coming from, and what they can achieve. The unique cards combine with the model to construct a picture of the querent's situation. The querent is delighted by the surprising accuracy with which the cards describe their situation. They're motivated to ponder the cause of the arrangement, even though the shuffling of cards obviously relies on accidental pattern.

Coincidence is itself a type of object, and one whose instances may accumulate over time from the perspective of a given observer. Aside from the range of weak and strong instances, coincidence is generally a subtle object, among the more abstract objects that require some analysis of sensory input to recognize. There is the doubt that it should be taken seriously at all, for the lack of rationalization implies the source of information isn't dependable. Yet in the midst of these obstacles, they can still continue to accumulate and become familiar to the observer.

Example. One witnesses a series of coincidences over a period of a year, and they occur with a steady frequency. Observations accumulate, and they form a super coincidence. Every new instance is a little more disturbing than the last, because it increases the conspicuousness of the super coincidence. Into the second year, they occur less frequently. The super coincidence subsides, and new instances are less disturbing. The observer starts discarding them again.

Imaginary object Say this hypothetical scenario has manifested in the eyes of some observant individual. The set of events is wide, involving a variety of different objects and environments. They don't just happen on Sunday mornings or full moons. Some are weak, and others are strong, and the observer starts to notice the weak ones more due to their heightened awareness. They extract the nature of coincidence itself, and refine it as a type of abstract object that appears consistently in every event. Upon analysis of each new event, two facts are reinforced: the event seems arranged, and the source of arrangement is absent.

The observer contrives an imaginary object to serve as a collection of unidentified sources of coincidence. As more instances are observed, the threshold of improbability is raised, so that only the most improbable events with no imaginable cause are added to the collection. Hypothetically, events may be added and thresholds may be raised ad infinitum, yet there is no magic threshold past which some extraordinary thing must finally manifest. The challenging improbability just causes the observer to start to believe it must be real, without identifying a single inherent quality.

Example. There is a small isolated village, where most inhabitants spend their entire lives, and speak only to other inhabitants and the rare traveler. They share observations, and together develop the understanding that many events cannot be rationalized. Weak coincidences are forgotten, and strong coincidences are passed down through storytelling. Listeners want to know what the cause is, and the storyteller describes, as best they can, the imaginary object. Their own understanding isn't so well conditioned by the

1 Observation

To formulate a definition of coincidence, some supporting concepts are first introduced that relate to observation. In some cases common words are given local definitions that fit the context of coincidence, so there are small deviations from the regular usage.

Thing A thing is whatever may be known to an observer, and whose qualities generally don't depend on whether or not it's being observed at a given moment. A thing can be a collection of things.

Observer Anything with a sense of awareness can be an observer. Humans, animals, and perhaps other things have awareness, depending on how awareness is defined. Here the observer is assumed to be human unless otherwise noted.

Object An object is a thing that an observer is presently aware of. If a thing is not observed, then it's still a thing, but not an object. Being an object is not an inherent quality of a thing, but a state that depends on its relation to the observer.

Example. A prominent mountain shapes the horizon visible from observers that are very far away. It can only be seen during the day, so its state as an object is periodic.

A special case is a figment of the imagination, which doesn't exist when it isn't being observed. It still exists physically through the observer's mental conception, and that's what makes it a thing. The work of imagination and the work of observation coincide at any given moment, but to show that they're truly distinct, consider a polygraph test. A lie is a figment of the imagination, and can be observed from the output of the polygraph. All it really shows is that the participant is working harder to think, but that's enough information for a skilled operator. If they weren't skilled and couldn't tell from the output, the lie would still exist.

Objects are natural to think about as those recognized by the five senses. Such sensory objects are not extremely small or large, and fit comfortably in the surrounding three-dimensional space. A child could recognize them, but maybe not pay attention to them for very long. The desire to focus on an object is not always motivated by the sensory qualities that make it visible, but requires an understanding of other qualities that the object is known to possess.

Symbol A symbol is a sensory object that's used to represent something that isn't otherwise present to the observer. Abstract objects are observed exclusively through symbolic representation. Here are a few common examples:

Type	Instance
A sensory object that isn't present	A photograph of a loved one
A physical object that is difficult to grasp	A chart describing temperature fluctuations
An object that is only presumed to exist	The Higgs boson before it was first observed
A completely imaginary object	The setting of a fantasy novel

Environment An object is surrounded by its environment. The extent of that environment is defined by the observer's awareness. Any thing in that environment is potentially an object to that same observer. A typical environment is one's immediate surroundings, which are recognized primarily by sensory input. It can be defined arbitrarily, perhaps including objects from recent places they've been. It may comprise a mix of tangible and abstract objects.

Example. Explorers are navigating an unfamiliar environment. What they see and hear is complemented by what they know, like what day it is, and which way is north.

Being an environment is a state of a thing, or collection of things, just like an object is a state of a thing. Any object may as well be an environment, and vice versa, depending on how it's perceived. The environment may include the observer, and the observer is potentially an object. The object may be aware, and it may observe the observer. The environment may contain only one object, which is the object, the environment, and the observer all in one.

Example. A line is drawn on a piece of paper. The observer typically recognizes the line as an object and the paper as an environment. The line is a particular figure, and the observer draws it on many different pieces of paper to get the figure just right. Then each paper is recognized as an object within a greater environment consisting of papers and figures.

Open and closed An open environment consists of things that may come and go without the observer's knowledge or discretion. The things in a closed environment are entirely known to the observer. No physical

Paranoia and prudence Paranoia is the excessive generalization of a type of object, due to some risk associated with a more specific instance of that type. The observer associates risk with some object because it correlates to some other thing, which is not present in the environment, but is legitimately associated with some risk and therefore suggests that the object also carries the same risk. Prudence is the same, but to a reasonable degree of generalization.

Example. I once bought a red kuri squash and baked it in the oven. I sliced it in half and, to my surprise and disgust, found a white maggot inside. It was only a single instance, but I'll never look at red kuri squash the same way, no matter where it comes from.

The objects were two squash, one of them the bad squash, and the other any benign squash. I generalized the bad squash to any squash, and saw them all for their potential to contain maggots. It would be paranoid to never buy squash again, and prudent to continue buying squash and mentally preparing myself before I cut it open, just in case you-know-what was inside.

Accumulation This heightened awareness may be initiated not only by a single intense event, but also by an accumulation of subtle events. The accumulation generates a coincidence, which may or may not be rationalized. The repeated occurrences can also refine the type of object that the observer should be more aware of.

Example. I stopped parking my car in my own neighborhood, due to how difficult it was to find parking, and the number of times I saw broken car window glass on the street.

The broken glass was of course no coincidence, easily explained by unseen thieves breaking into cars. That assumption directed my course of action to park somewhere else. Since I knew car thieves don't hang around or keep striking the same spot, objects like broken glass required some accumulation to gain credibility. The frequency over several instances helped decide if it was worth the cost of avoiding.

The accumulation of multiple events would seem more credible than a single one, but their subtlety and number present challenges. It could take a few for the observer to notice at all, and a few more for the observer to start tracking them. Their subtlety might require a written record to help the observer measure how coincidental they are, assess risk, and compare to some cost of acting on the situation.

was my story combined with my manager's limited English vocabulary. To seriously attribute drug use to a small town just for the spelling of its name would be derogatory, but one cannot be blamed if the thought crosses one's mind. The notion that it would cross someone's mind at the meeting was enough for my manager to perform damage control.

The remaining events are of course coincidental for being unfortunate, but hearing the phrase "a series of unfortunate events" is related in a bizarre way. In this event, the objects are me and the other person. The relating quality is the phrase, since it applies to my situation as well as some other situation the person was describing. The only explanation other than pure chance would be if we were observing the same events, which is preposterous. The coincidence was nonetheless disturbing and made me more likely to evaluate events in the near future for how unfortunate they were.

Tolerance As coincidences continue to be recognized, finding explanations by chance or causality may become more routine and accurate. If explanations aren't found, coincidences can become disturbing and stressful. Tolerance can be gained in two ways: One is to effectively explain coincidences by chance or causality, so they fit within one's normal sense of reality, and they don't distract from daily life. The other is the ability to cope with a growing accumulation of coincidences that cannot be explained. The observer might disregard them completely, or create some interpretation without trying to understand how they come to exist.

> Example. I went to a music store to buy an electric piano. My debit card declined twice despite having sufficient funds, so I drove to the bank a few blocks away to get cash. The line at the bank was very long, and I took a wrong turn on the way back. I made a U-turn and saw two cop cars, and a few more on the way back. Despite the short distance, it took a long time due to heavy traffic.

The card declining, wrong turn, string of cops, and heavy traffic formed a stroke of bad luck. This coincidence was conspicuous like any other, and so was the act of making a large purchase, so the bad luck and the large purchase formed a coincidence. Clearly there was no rationalization to be found between them, and normally I would have the tolerance to not let it disturb me, but the problem was that heavy traffic had me stuck in my car with nothing to think about other than the two conspicuous events that I was sandwiched between. The knee-jerk reaction to evaluate had a prominent position.

environment is absolutely closed, but may be closed to a degree that is sufficient for some purpose. Symbolic environments can be closed.

> Example. A traveler in a passenger train recognizes an open environment of surrounding passengers, who are often strangers coming and going from all sorts of places unknown to the traveler. The environment is partially closed from the conductor's perspective, because each passenger is registered when they purchase their ticket, and only a few exceptions board without a ticket. The train route is more reliably closed. There are 35 stops, and changing that number would require planning years in advance.

Inherent quality The qualities that define a thing are inherent to it. They don't depend on the thing's state as an object, meaning it doesn't matter whether the observer is looking or not. When referring to a thing as an object, all the same qualities are assumed.

Environmental quality An environmental quality is a quality of an object that depends on other objects in the same environment. Given the local definition of *environment*, which is scoped to the observer's awareness, a thing can only possess an environmental quality as an object observed within that environment.

Observational quality An observational quality is a quality of an object that depends on the observer. Being an object is the fundamental observational quality. An observational quality may involve other inherent or environmental qualities.

> Example. A soccer player focuses on a soccer ball. The ball has a circumference of 69 centimeters. This is an inherent quality. The ball has a perceived visual angle, which depends on its distance from the soccer player. This is an observational quality. The ball has a weight of 430 grams. The soccer player considers this an inherent quality. From an alternative perspective, it's also an environmental quality, because weight is measured with respect to Earth's gravity.

Relation Objects are related if they share some quality. If they share an inherent quality, then they have an inherent relation, and similarly for environmental and observational qualities. Objects involved in a coincidence are related by observation, or have an observational relation. A relation can relate a set of objects that share the same quality. A relation is an abstract object.

Type A type is a collection of qualities that characterize a thing. A type of thing refers to any thing that possesses all the qualities that

comprise the type. An instance of a type refers to one of these things, and can still have other qualities that distinguish it from other instances. Since a thing can be an object or an environment, there can be a type of object or type of environment. A type is also an abstract object.

Example. Let $T = \{t_1, t_2, ..., t_m\}$ be a set of qualities an object may possess. Let $A_T = \{a_1, a_2, ..., a_n\}$ be a set of objects such that every $a \in A_T$ possesses every $t \in T$. Then T defines a type of object, and A_T is a set of instances of that type.

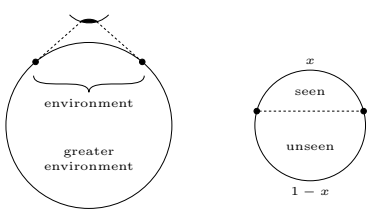
Example. A lake in Minnesota is a type of object. Qualities that comprise this type include, but are not limited to, being a lake and being in Minnesota. Lake Whitefish is one instance. A lake in Minnesota could also be a type of environment that defines what things are in it.

Common and varying quality Consider a type defined by a set of qualities. Instances of the type each have these qualities in common, but they can still possess and vary by other qualities as well. These are called varying qualities. Things belonging to the same type have limited varying qualities in a closed environment, and unlimited varying qualities in an open environment.

Example. A website allows anonymous users to create an account and start posting content to the website. Posts are limited to ASCII characters. The webmaster considers the environment closed, because nothing can be posted that isn't made of ASCII characters. End users are more interested in the meaning conveyed, and consider the environment open so long as there is no censorship.

Projection Some varying qualities are so universally prevalent that observations of them in the immediate tangible environment can be used to make inferences about some wider, more open environment beyond the reach of sensory input.

Example. The time clock in a workplace measures the time someone is present. Since time behaves the same outside the workplace, the time clock also measures the time someone is not present with no less precision or completeness.



Conspicuous relation Coincidences formed by conspicuous objects are highly interpretable. When two conspicuous objects share the same environment, the observer naturally compares the two for any inherent qualities they may share, which would resolve the coincidence or the conspicuousness. A relation might not be discovered that rationalizes their proximity and resolves the coincidence, but some other relation might be found that holds some meaning to the observer.

Example. I was on the phone with a most belligerent customer, who would go in circles about grievances and make offensive comments about me and use unprofessional language, but unlike those of typical customers, his problems were actually legitimate and complex, so I needed to put up with him for an unusually long time. A couple of minutes after I ended the call, I saw someone outside my window wearing a full clown suit. He even had the clown makeup on and was riding a small bike.

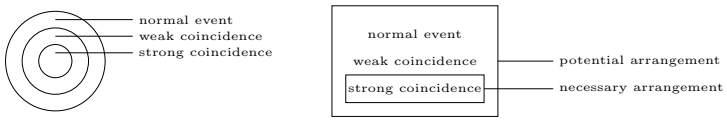
The customer and the clown were related by proximity and by being conspicuous, so naturally I related them. It did make sense to think of the customer as a clown in a sort of ridiculing way, due to his behavior and my resentment, and I wouldn't have done so without seeing the clown outside my window. The only real relations, by proximity and by conspicuousness, had nothing to do with how the customer resembled a clown, yet they alone facilitated the comparison.

Disturbance Consider the perception of coincidence in this two-step process: First, the observer recognizes an unexpected proximity between two objects, and second, the observer is motivated to seek other relations between them that rationalize their proximity. The first step is a knee-jerk reaction to sensory input, and the second step is more controlled, logical thinking. Now assume that no rationalization is found. In this case, the proximity doesn't disappear, and the situation causing the knee-jerk reaction is still there to cause that reaction repeatedly, even after the observer stops seeking rationalization.

Example. My manager felt the need to emphasize to the team he doesn't encourage the use of marijuana, after I told them I visited the town of Weed, California when asked about my vacation. Later that day I got stung by a bee. The next day my car battery died, and the day after that I heard someone say "a series of unfortunate events" in the same park where I got stung. That weekend my date canceled.

In the first event, the objects were the two distinct meanings of the word *weed*, and the quality that related them was their spelling. For the sake of analysis, let the observer be my manager. The environment

Strong A strong coincidence evades any reasonable explanation. Attempts involve some distortion of one's normal sense of reality. The phenomenon of strong coincidence demonstrates that one's intuition of probability is stronger than one's understanding of the surrounding environment. It demands that some undefined thing ought to reside within the environment, yet it fails to assume the state of an object, as if the environment has a hole or sudden edge.



One might recognize an undeniably strong coincidence, and it may even be confirmed by other people who fail to agree on a plausible explanation. Even still, the event is easily forgotten, because it doesn't integrate with the usual daily to-do list. Strong coincidences have staying power in the observer's mind, but unless they can go somewhere, their influence will fade. Without some interpretation, isolated events fade as strange, motionless monoliths that sink into the ground.

Parallels Parallels can be drawn between all kinds of events that would otherwise have nothing to do with each other. This is especially true for unexplained coincidences, because there's not much else to do with them. Drawing some parallel between events may yield a course of action in some real environment that isn't directly correlated to the environment where the coincidence was observed. The parallel doesn't guarantee correct guidance, but could reveal different options to evaluate a situation and make a decision.

Example. I saw a spider on the other side of a window as it approached a fly caught in its web. It spun the fly around into a silk cocoon, and then climbed up its silk thread with the fly, up and out of view of the window. I had never seen a spider wrapping its prey in silk before. Only days later I saw a video of the same, recorded by someone I recently met.

The emphasis of seeing this in real life, followed by a recording of it by someone I knew, made it seem important without me knowing why. I contemplated the roles of the spider and the fly. I thought maybe I could apply the roles to people I knew at the time, and reevaluate a situation they were both involved in. The interpretation would have been unreasonably cynical, but the coincidence made it tempting.

Subjective observation An observation is subjective if it attributes observational qualities to the object. In other words, it depends on the observer's perspective. All observational qualities are subjective. It's usually not the observer's intention to be subjective. They prefer to recognize inherent qualities of an object, not observational qualities. The difficulty is presented by the openness of the environment. In a closed environment, the observer can control all the things, and make sure none of them get in the way of the particular thing they want to objectify, whereas in an open environment, some things are not controlled, and the observer can't stop them from getting in the way.

Objective observation An observation is objective if it attributes only inherent qualities to the object, so it doesn't include observational qualities or depend on the observer's perspective.[1] Objective observations of the same object are the same for all observers. Just as with closed environments, pure objectivity is difficult to achieve, and not practically necessary in application. Multiple objective observers (or observations by the same observer) arrive at a consensus to weed out individual subjectivity. Then they can say with reasonable confidence that certain qualities of an object are inherent, and not observational.

Environment	Observation	Quality
Open	Subjective	Observational
Closed	Objective	Inherent

Example. Sensitive instruments are used in experiments to exclude noise, or undesired objects, from an observation. Radio telescopes can observe during the day as well as night, but are subject to interference from radio signals used for communication.

Relative objectivity Objectivity is achieved by an observer in a closed environment, because every thing in the environment is identified. An observation may be objective with respect to the closed environment, while subjective with respect to some greater, open environment.

Example. A corn maze has a tower at the center, so people who reach the center can climb up the tower and see the entire maze from above and find the path to get out. Not including the corn, they have an objective perspective of the maze, because they can see all the different paths to take.

[1] This aligns with the standard definition of *objective* and not the local definition of *object*.

Including the corn, their perspective is subjective, since they are missing out on some detail being so high above the ground.

Event An event is an observation that includes one observer, one environment, and at least one object. Given the observer is human, an event necessarily happens in real life, including dreams (the dreams aren't real, but the observer's experience of them is). While abstract objects aren't physical, they can still participate in events, because they are made physical through human conception. Events are things, and there may be types of events.

Example. An annual conference is a type of event, and each year is an instance. The type of event describes what happens every year. The year in which each event occurs is sufficient to define each instance uniquely, and there may be other varying qualities that differentiate instances, depending on how boring it is.

Coincidence A coincidence is an event where two objects are related by observation in the same environment, and are also related by some other quality that has no relation to the environment.

Example. I was at a department store and picked out a bed sheet having a certain deep blue color. Then I stood in line at the cashier, and the next person in line was wearing an outfit with the same color from head to toe.

The objects were the bed sheet and the outfit, the observer was me, and the environment was my position in line at the cashier. The objects were related by my observation and their deep blue color. Nothing about my position in line would make the objects have the same color. For example, if I chose a gray bed sheet instead of a blue one, it wouldn't make the next person in line more likely to be wearing gray.

2 Chance

Coincidence can be explained by chance or causality. Actually, chance is a form of causality, but it's so universally prevalent that it's thought of as a companion to more specific causes, or a backup when those causes fail to materialize. The notion that something was caused by chance usually indicates a lack of control. When all else fails, chance can be leveraged as a cause, because it's governed by the normal distribution. By that constant, the observer can project the complete space of possible events, including the observed event and all the others that didn't actually happen, and calculate the probability of the observed event.

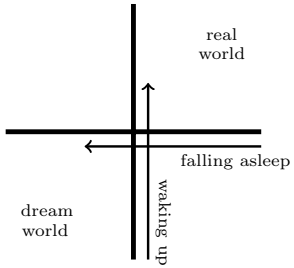
Example. On a Monday, I overslept and was a half hour late for work. It was the first time it happened in three years. It happened again that Thursday. For both days, I went to bed at a reasonable time. I considered what the cause could be, and recalled I used to have a backup alarm, but it broke a few months ago and I never replaced it. The backup alarm was rarely necessary, so it took a few months to demonstrate that it was still needed.

The objects were oversleeping on Monday and Thursday, the quality that related them was oversleeping, and they were related by observation by happening to me in the same week. The quality of oversleeping alone didn't explain why it happened twice in the same week, so I looked for other qualities that related the objects and accounted for their relation by observation, leading me to remember the backup alarm. I went through this process in an effort to show up to work on time, and the interpretation yielded.

Measure Measuring the strength of a coincidence can be challenging, because most observations are not quantitative, and the probability cannot be calculated. The indispensable position of the observer and their ability to recognize subtle relations are also bound by mental measurement, limited to eyeballing the normal distribution. For example, the comparative distance of two stars is unfathomable to anyone without the requisite tools and techniques. While the observer of coincidence typically doesn't quantify their observations, it helps to have a firm understanding of the elements, and they are described here.

Weak A weak coincidence is any coincidence that can be easily explained by chance or causality. The common connotation of coincidence doesn't include weak coincidences, because once they're explained, their quality of being coincidental is no longer remarkable. The state of being coincidental depends on both the event and the observer. Some coincidences are harder to rationalize than others, and some observers are better than others at rationalizing.

Example. A truck driver subconsciously observes thousands of relations among cars passing on the highway every day, and over time develops an intuitive sense for the different types of cars, and how some types are less common than others. When a new model is introduced, seeing two cars of the same model in the same day may appear coincidental, but if the model becomes popular, such coincidences become gradually weaker.



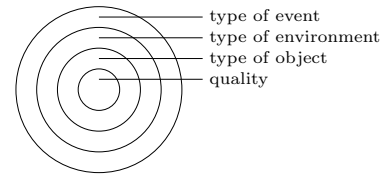
Zoom into the center of the twist, so the rounded parts are out of scope, and it looks like an upright cross. The dream world and real world are connected at a single point by either of two events: falling asleep or waking up. Each of these events has a direction, exiting or entering one world or the other. This is also described by a twist that has a direction. The segments of the twist that intersect are labeled as these events, and follow the same direction.

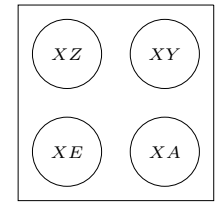
5 Interpretation

"For shepherds have often seen animals in the fields give three or four jumps into the air, and then suddenly fall to the ground and die; and this is caused by the power of witches at the instance of the devil."
– Malleus Maleficarum

The concepts introduced thus far have been invariant to the human experience. While the function of the observer is critical, the observer may just as well be a computer with sensors, programmed with the components of the previous chapters. One can imagine there are better observers than others, who can synthesize wider environments, and notice more subtle relations that turn out to be the most consequential. The observer is a router through which all relations pass, because coincidence is ultimately a phenomenon of perception. As a thing loses the state of an object when it isn't being looked at, so a person loses the state of an observer when they aren't focused on the coincidence. The present chapter describes what a person does with their observation, or how they apply that information to their life.

Base case As with recognition, the interpretation of coincidence is a standard tool in understanding one's surroundings. Common coincidences are rationalized, and then they are interpreted to yield a course of action.





Randomness Let some environment be defined by the type of object it contains. Let X be a quality that defines that type, so every object in the environment has the quality X in common. The objects also have a unique quality Z, Y, E or A. It is the quality X that allows for the comparison of these objects by their varying qualities. Randomness is the resulting inconsistency that is observed. Randomness is an environmental quality, since it depends on how objects in an environment relate.

Example. There's a service that offers a weekly subscription to get a box of assorted vegetables sourced from local farms. Every week it's the same box for the same price, but a different assortment of vegetables. Getting a box is a type of event, and the box of vegetables may be interpreted as a type of environment. The vegetables inside are types of objects within the environment. Each week there is a different outcome.

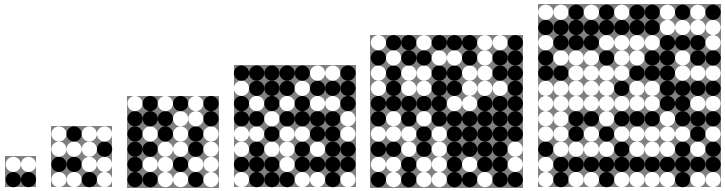
Example. A DMV is busy on a Saturday, with many people waiting in line. Everyone there has an issue pertaining to their license or registration. Asking someone if they want to drive produces a consistent answer. Asking someone what their name is produces a random answer.

Instance An environment defined by a type of object contains different instances of that type of object, and the different instances may be compared. Another way to compare differences is to compare multiple instances of the same type of event.

Example. A type of event is flipping a coin. All instances of the event involve a coin being flipped, but some produce heads and others produce tails. One hundred instances of the event produce one hundred outcomes. Alternatively, one environment may involve one hundred coins, with a single event where every coin is flipped at the same time. Then one event produces one outcome with one hundred heads or tails.

Consistency Consider a type of thing that allows for varying qualities. The number of instances may be compared to the number of varying qualities. When there are relatively few instances, the varying qualities make instances appear random. As the number of instances grows and greatly

outnumbers the varying qualities, a texture of consistency emerges. Consistency is an environmental quality, because it emerges from a group of instances, which are all objects in the same environment.



In the preceding figure, each circle belongs to a type that allows for limited varying qualities, specifically the colors black and white. Squares facilitate their comparison at the group level, and at six stages where the number of instances increasingly outnumbers the varying qualities. Consistency emerges from left to right.

Example. A cafe has a soup of the day. New customers ask what it is and have no idea what to expect. A regular customer has been ordering it for years and knows it will be one of about seven recipes.

Example. There is an old growth forest that spans fifty square miles. The density, or number of trees per square mile, is consistent across the whole forest, while the distance between any tree and the tree closest to it varies.

Pattern Any consistency among objects in an environment is a pattern. The basic unit of pattern is two objects that are compared and share the same quality. One pattern can involve any number of objects.

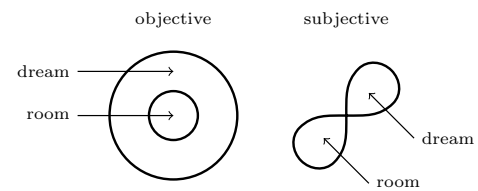
Example. A hiker spends the day hiking through a forest, listening to ambient sounds coming from the wind, insects, streams, and other sources. At one point he hears a woodpecker. The woodpecker hits the tree with its beak many times in succession at a regular interval. The hiker recognizes this pattern and knows it must be a woodpecker. His encounters with woodpeckers seem to occur at random.

Arrangement If a pattern is caused intentionally, it's an arrangement. Arrangement may be due to any single, identifiable cause. The pattern identified within a coincidence may be explained by some human activity, or a tendency of nature to behave a certain way.

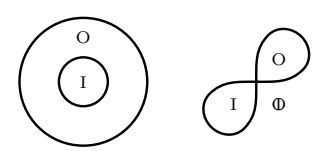
Accident Pattern that isn't arranged is referred to as an accident, or accidental. This kind of pattern isn't maintained, so it doesn't tend to last. It's possible some pattern may appear, and the observer can't tell

bottom with a ramp on the inside, and an enclosed base. It seemed a marble should be dropped through the tower, then hit the ramp and roll through the hole and around the enclosed base. The sculpture seemed to serve a ceremonial purpose. I took it home and set it on a table. Later that night I began to fall asleep on a couch a few feet away. I had a most vivid nightmare of a black hole. As I opened my eyes, the first thing I saw was the sculpture, and I was convinced it was the cause of the nightmare.

The objects were the sculpture and the nightmare. An inherent quality that related them was being disturbing. An environmental quality that related them was being conspicuous: the sculpture was a rare find, and at the time I didn't have nightmares very often. An observational quality that related them was being observed by me. Since both events were rare, they were easily correlated, and the sculpture was to blame as the cause of the nightmare.



From an objective perspective, the sculpture and the nightmare were in the same room, as represented by concentric circles (or a donut). The dream world was within the real world, since the observer was sleeping in the room. However from the observer's subjective perspective, the environment of the nightmare wasn't necessarily inside anything, since the observer didn't perceive the room while experiencing the nightmare. They appeared as two separate environments, connected only by the experience of falling asleep or waking up. The twisted circle (or twist) represents this separation, and connects the environments only by a point of intersection.

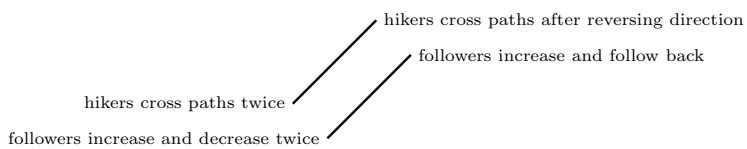


Consider the twist's curve and the two spaces within. The curve is equivalent to the inner circle in the concentric circles, and the spaces in the twist are equivalent to the spaces in the donut. In a sense, the two spaces are also outside the twist, together as one, but this doesn't really relate back to the example.

store carried them. The customer would have also recognized the coincidence between her looking for balloons and the balloon store across the street. In both coincidences, the quality that related the objects was having something to do with balloons. Since the coincidences had the same relation in common, they intersected. They also formed a super coincidence, because balloons weren't common things to hear or think about, so chance was not a convincing cause.

Parallel lines

Example. On Monday my number of followers on Instagram went up by one and then back down, though I didn't check who it was. This happened again on Tuesday. On Wednesday, I went for a walk in a forest and passed by the same person two times. This happened because we both were walking along the same loop, going in opposite directions, and apparently starting at opposite ends. I didn't mean to go in a loop, and was trying to get to the beach, so I reversed course, noting I wouldn't pass the same person a third time unless she also reversed course. Indeed we passed a third time on my way to the beach. I noted the parallel between the first two passes and the follows on Monday and Tuesday, and considered how the behavior on Instagram might parallel the third pass in the opposite direction. I figured there would be a third follow, and I would reverse course by following back before being unfollowed again.



The follower event and the hiking event were each weak coincidences that could have been explained by chance or human intervention. Each event can be described by three points. For the follower event, each point is a follower increase, and for the hiking event, each point is crossing paths on the trail. The lines don't intersect (except through the observer's conception), but they have a similar structure, where the first two points are in some way opposite the third. Since they belong to isolated environments, they don't intersect.

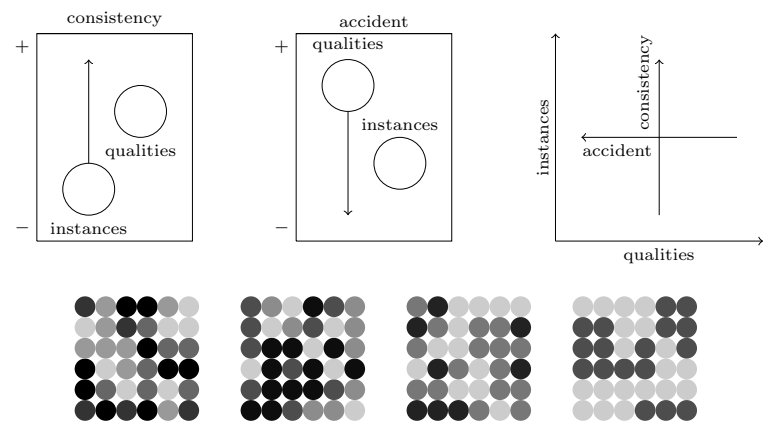
Twisted circle

Example. I passed through an alley as I walked home from work, and spotted a weird sculpture on the ground next to a garbage can. It appeared to be a crude, miniature clock tower. It was painted white and had a bent nail resembling a clock hand. It had an open roof, a mouse hole at the

if it's arranged or by accident. Accidental pattern is luck, be it good or bad.

Example. The regular succession of wood pecking is an arrangement by the woodpecker. If the hiker hears two woodpeckers in one day, when he usually hears just one every few weeks, he may assume it's an accident if there doesn't seem to be another cause.

How does pattern emerge by accident, or without being arranged? The cause is comparable to consistency. Consistency increases when the number of instances increases with respect to the number of varying qualities. In the figure with the black and white circles, the number of circles increases, and the number of colors is always two. Accidents happen when the number of varying qualities decreases with respect to the number of instances. With fewer qualities, objects that are compared are more likely to share the same varying quality.



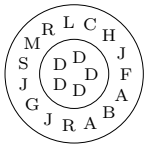
In the preceding figure, the four grids each have thirty-six circles, colored with varying shades of gray. From left to right, the number of shades is five, four, three and two. Also from left to right, adjacent circles are more likely to have the same shade. This is because the number of varying qualities decreases with respect to the number of instances, so the number of accidents increases.

Example. People in small towns are more likely than people in big cities to run into familiar faces when they go to the store. There are fewer varying qualities, meaning there are fewer people. To ensure a fair comparison, the observer compares people that shop just as often, so the number of instances doesn't vary.

People distinguish between arranged and accidental patterns all the time through their regular daily activities. A lot of problems are recognized or acted upon once something happens too many times to ignore. Small patterns may be arranged or accidental, and as patterns increase in magnitude, they're more likely to be arranged. When is it time for one to act upon the assumption that a pattern is arranged? This question may deserve careful consideration depending on the context. The answer may depend on reaching a certain degree of certainty, or the severity of some consequence.

Example. A commuter cyclist knows that in the months of May and June, it may rain at some point on his commute regardless of the weather forecast. It doesn't happen very often, so if it's sunny when he leaves for work, he won't bring rain gear and accept that there's a chance he'll get rained on later in the day. However, in January it rains almost every day, so he brings rain gear even when it's sunny when he leaves for work.

Example. There are twenty students in a classroom, and five of them have a name starting with the letter *D*. Five are selected at random to read from their textbook, and they happen to be the five students whose names start with *D*. Even though the event is very unlikely, there is no obvious cause, and it's rather inconsequential, so some remarks are made regarding the unusual sequence of names, and they proceed to read from the textbook.

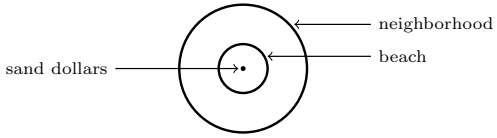


If one suspects an event is arranged and not accidental, the only way to know for sure is to identify the cause. How does one even suspect an event is arranged before the cause is identified? A degree of certainty is reached by estimating the probability of the pattern occurring by accident. If the probability is below some threshold, then one may suspect that the pattern is arranged, and even act on that assumption without identifying the source.

Example. In a game of dice, a player rolls five dice and would ideally have them all land on the same number. The consistent number is an accidental pattern. A player may be having a lucky night, and their rolls frequently land on the same number. Since this kind of pattern isn't controlled, there is no expectation that the luck will continue. The longer it continues, the more other players are tempted to look for some hidden arrangement by the lucky roller.

Concentric circles

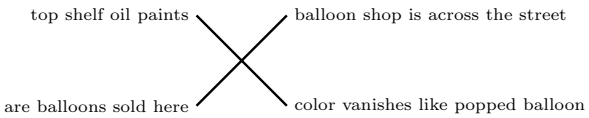
Example. I moved to a town with a long coastline, but it was mostly blocked out by private property. I explored the neighborhoods, and noticed an unmarked path at the end of a road. I walked down the path and noticed a sign saying it was property of the county, however it wasn't marked on a map. The path led to a beach, and on the beach I looked around at the stones and shells. I found a few sand dollars, which I'd never seen before in their natural habitat. I was surprised to find them, but not surprised to find them in multiplicity, since they live in colonies.



The two events were discovering the beach and discovering the sand dollars. The beach was a conspicuous object, and the neighborhood was its environment. The sand dollars were conspicuous objects, and the beach was their environment. Hence there was an environment of objects within another, as represented by the concentric circles. The beach can be interpreted as either an object or an environment, depending on the event. Another interpretation takes the collection of sand dollars and the beach as two objects in one environment, and relates them for being conspicuous.

Intersecting lines

Example. I was fed up with a brand of oil paints whose color vanished with the slightest admixture. I likened the color to a balloon that popped after a slight pinprick. I went to the art supply store for new paints. When I first walked in, I overheard another customer ask a cashier if they carried balloons. The cashier informed her that, incidentally, there was a balloon shop just across the street.



The oil paints, the other customer, and the store across the street were all related by having something to do with balloons. Only I recognized the coincidence between the oil paints and the customer asking if the

4 Visual Notation

The notion that some coincidence is too improbable to explain via chance typically relies on a purely intuitive sense of probability, or how frequently a type of event is known to occur. That sense is so subjective that it can hardly be put into words, let alone be claimed as objective. The only reasonable solution would be to restrict observations through scientific instruments, but this is blind to nearly all the coincidences witnessed through human experience.

There is another sort of obstacle that can be overcome without restricting the observer to tool-assisted observations. Coincidences usually don't come in neat packages like the ones given so far, where the elements are obvious to identify. There can be many different objects, environments, instances, and relations. Coincidences can combine with each other and blend into more normal events. Graphical representation helps abstract away unimportant details and figure out how things are related, and how different places are pieced together into the same environment.

Figures The shapes below are used to represent elements of events, such as objects and environments. They can be combined to represent more complex events and help understand what's happening.

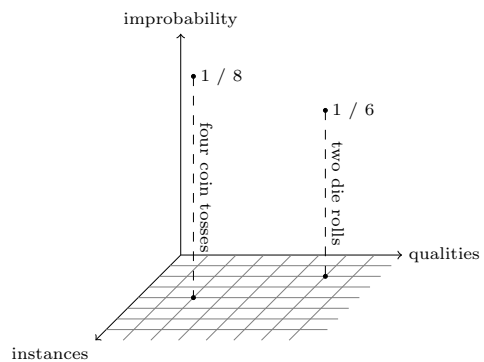
Lines and circles can be combined to describe more complex events. Objects in an event are represented by points, and a line may connect the points to show the objects are related by some quality. The points may be surrounded by a circle to show the objects are in the same environment, or are related by observation. The circle defines the border of the environment, or all that the observer is aware of regarding the event.

Two lines represent two sets of related objects. If they intersect at some point, then that point represents an object that belongs to both sets, so it has the qualities pertaining to both sets of objects. If the lines don't intersect, no object belongs to both sets. If the lines run parallel, the sets might have some common structure. For example, each set has eleven objects. Two circles represent two environments. If they are concentric, then one environment is contained within the other. A twisted circle represents one environment that appears as two to the observer.

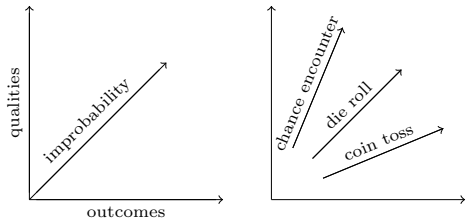
Example. I responded to customer support cases at work. When a new case was assigned to me, a bell would ring so I would know. One day a coworker of mine was doing the same thing, but had no cases assigned for three hours, which was an unusually long time in between cases. Other coworkers reported the same issue. It turned out there was a software bug that kept new cases from being assigned. The three hours without cases was a pattern that my coworker failed to act on, and our manager was upset with him.

Improbability The improbability of a pattern increases in two ways. One way is when the pattern is extended by more instances that share the same quality. The other way is when the number of varying qualities increases, so that instances are less likely to share the same quality. Compare flipping a coin to rolling a six-sided die. The coin has two varying qualities, and the die has six. Flipping a coin over five instances and seeing it land on the same side in every instance is not as improbable as seeing the same with a die. However, coin flips can be more improbable than die rolls when combined with a greater number of instances.

Instances	1	2	3	4	5	6
Coin toss	1/1	1/2	1/4	1/8	1/16	1/32
Die roll	1/1	1/6	1/36	1/216	1/1296	1/7776



Consider an object that has not two or six varying qualities, but a hundred or a thousand. Then seeing the same outcome even twice in a row would appear very unlikely to happen by accident. A well-known example is the chance encounter, which is a type of coincidence.



Example. I ran into a friend at a food co-op, and hadn't seen her for a few months. We caught up, and I mentioned I was going to Maui on vacation the following week. It just so happened that she grew up in Maui, and gave me some recommendations. As far as I was aware, she could have grown up in any number of places, and as far as she was aware, I could have chosen from any number of vacation destinations. The match among so many varying qualities, combined with the chance encounter, was cause for some surprise.

Example. I met somebody at a metal show in Chicago, and we started talking because we both lived in Berkeley for a while. She mentioned someone named Consuelo, and I also happened to know Consuelo. We naturally explored this event to rationalize the coincidence, and found nothing. It turned out we each knew Consuelo as a coworker, but from unrelated jobs. We confirmed various qualities to make sure we were talking about the same Consuelo, thus establishing objectivity.

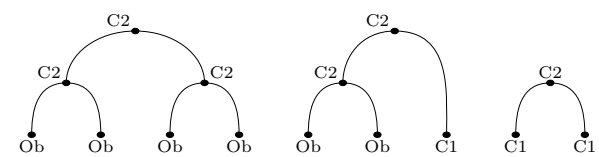
3 Causality

Causality Chance relates to accidental pattern, or the possibility that two objects may appear together at random once in a while. Causality relates to arranged pattern, where further evidence supports the plausibility that two objects are observed together. In the context of coincidence, this is also referred to as rationalization, because one finds a rational explanation that resolves the coincidence.

Example. When I was very young, I taught my grandpa how to play the card game War. The rules were as follows: After half of the deck is distributed to each player, the players go through rounds of drawing the top card from their respective decks and comparing them. Whoever has the card with the higher value takes both cards and adds them to the bottom of their deck. This repeats until someone has all the cards. If the cards that are compared are the same value, a second pair is compared, and whoever has the higher card takes both pairs of cards. If the second pair is also the same, then a third pair is compared, and so on. My grandpa and I began to play, and the first two cards we drew were the same. The second two cards were also the same, and the third, and so on, until both of our

Conspicuous coincidence Conspicuousness is a quality that an object can possess, thus two objects may be related by being conspicuous. Since by definition the quality of being conspicuous lacks explanation, so does the relation. Therefore two objects related by being conspicuous automatically form a coincidence. The observer witnesses a pair of conspicuous objects whose proximity is not explained by their conspicuousness, because their conspicuousness cannot be explained in the first place. Since conspicuousness doesn't depend on any inherent quality of a given object, relation by conspicuousness easily compares very different things that would otherwise be hardly related.

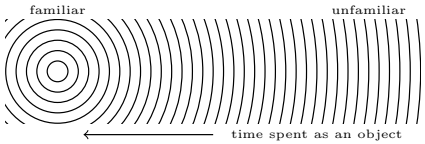
Example. I set out at noon to hike up a mountain in the desert, not knowing exactly how far it was. When I got to the foot of the mountain, it was already late afternoon, and I decided to keep going anyway and spend the night at the top, despite having no camping gear. As I continued my ascent and the sun started to set, I passed a bleached turtle shell. The thought of a slow turtle juxtaposed how important it was for me to get to the top before it got dark.



Left to right: Two coincidences form a coincidence. A coincidence and a conspicuous object form a coincidence. Two conspicuous objects form a coincidence.

Coincidences are themselves conspicuous, because they attract attention for some unexplained reason. An observer can recognize multiple coincidences and relate them for having conspicuousness in common. The relation is naturally disconnected from the environment and lacks explanation, so it forms a new super coincidence. Any proximity of coincidences accumulates in this way, causing events that are only mildly abnormal to merge into something greater and more disturbing.

Example. I went into work on Halloween. On my way in, a customer stumbled into a wine bottle display, and ten or so bottles of red wine shattered on the floor. A few hours before my shift ended, I injured my hand and needed to leave work early. The red wine event was reminiscent of danger and blood, so I related it to my injury, although the proximity of the events had no reasonable cause. I got a flat tire on my way home, which wasn't terribly unusual, since I got a flat every few months. However, my injury prevented me from fixing the flat on the road, so the injury and the flat necessarily related and inspired a haunting presence. The accumulation of bad luck made the whole day conspicuous, coinciding with the holiday.



Conspicuousness Consider a coincidence not as an event, but as a quality that two objects share, that is to say, each object is coincidental. Being conspicuous is like being coincidental, except there is only one object. An object that is conspicuous, or a thing that appears conspicuous, attracts a level of attention that seems undeserved. The observer definitely recognizes it, but has trouble understanding why it ought to be recognized.

Example. Sailors in the Indian Ocean are caught in strong monsoon winds, and their ship is blown off course. The ensuing environment is unfamiliar, and it takes them several days to get back on course. During this time they travel along the edge of their environment, as defined by the route they usually take and the experiences that come with it. They're more likely to encounter conspicuous things along their detour. Those things become a little familiar, but not a lot, because the sailors never return to the area.

There are familiar types of objects that make this diversion of attention seem normal. A particular assembly of plastic and metal is recognized as a phone, and gets all the more attention for it. When people see one, they figure such an arrangement of plastic and metal is worth their attention. A certain individual is elected mayor of some city, so they become a household name. The phone and the mayor are types that are known to attract attention. A conspicuous object somehow attracts attention without conforming to a familiar type.

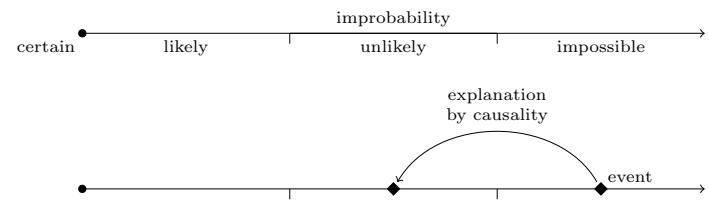
Example. An auditorium is filled with spectators, and the stage is empty. Audience members attract little bits of attention as neighbors talk among themselves. A pianist walks on stage, applause erupts, and a great imbalance of attention is focused on the pianist. They don't appear conspicuous, because they are dressed up and conform to the type that the audience members expect. If it were anybody else, they might appear more conspicuous.

Example. I came home from vacation and found a gum wrapper on the ground in front of the front door. It was right in the middle of the front walk. I picked it up and threw it out. The placement of the wrapper suggested it was a signal for someone else to check if anyone was home, for if anyone was home, they would be sure to pick up the litter as I had done. To any neighbor or passerby, the gum wrapper would appear completely inconspicuous.

decks were exhausted. I was astounded by the improbability of the event, and my grandpa didn't have any explanation, so I regarded the event as a coincidence.

Chance failed to suffice as an explanation, and an explanation by causality wasn't recognized by the observers. One explanation is as follows: The deck was a new one that had never been shuffled, and the cards were in order by value. The deck was distributed to each player one card at a time, and the respective piles were kept in order as cards were distributed. That way every pair of cards matched. This explanation leaves nothing to chance. Not only was the outcome not unlikely, but it was certain.

More often, explanations by causality are merely an accessory to chance. An observer discovers an event so unlikely that it's unbelievable, and then finds some explanation that makes it at least plausible. It's still unlikely, but not impossible, and this is enough to put the observer at ease.



Example. One estimates that the odds of some event happening are one in a million, and then after further consideration of the surrounding circumstances, reevaluates the odds as one in a thousand. However, one remains skeptical and unwilling to disregard the event as an accident, because it caused a considerable loss of money.

Hidden quality In a coincidence, there is some apparent quality that relates objects to each other, but doesn't seem to relate to their environment. To resolve the coincidence, the observer looks for some hidden quality, which explains how the coincidental quality is indeed related to the environment.

Example. My family had adjacent rooms in a hotel, and both of our tubs were backed up. A plumber arrived and found an explanation: the tub drains converged, and there was a clog past the convergence, so the clog affected both tubs.

The environment was the adjacent rooms, the objects were the tubs, and they were related by being backed up. The explanation revealed a hidden quality that related the objects, which also explained why they were related by observation.

> Example. An observer's phone is beside him on a table. It starts to ring, and then the battery dies. It's an important call, and he feels haunted by his bad luck. He tries to keep the battery charged, and while it will still die once in a while, dying right when he gets a call seems coincidental, because the chance is so unlikely, and he can't think of any cause.

The objects are the incoming call and the battery dying. The environment is the phone during the brief moment that it rings. The quality that relates the objects is the phone, which requires battery life to take the call. An explanation by causality is that calls drain the battery faster than just sitting on a table. If the observer recognizes this, he may find the probability of the event believable, even if it's still unlikely.

Human intervention People can construct an event so that it appears to the observer as a coincidence. This human intervention obscures some reasonable cause as to why objects are observed together. This sort of "coincidence" is unique in that it requires some effort to create, whereas other coincidences emerge naturally. An observer may find this sort of explanation tempting when more benign causes fail to materialize, but could also be implausible due to the resources required to set it up.

> Example. A man on the street is confronted by the police after they see him jaywalking. They search him and find an unregistered gun and illegal drugs. He is charged with possession.

The objects are jaywalking and possession. The quality that relates them is the offender. Since jaywalking doesn't necessarily imply possession, the man appears to have bad luck for possessing at the time of the confrontation, but there is a better explanation that doesn't resort to chance. The police know the man, and also know he is likely in possession, so in his case enforcing the jaywalking law has a potentially high yield.

> Example. A grocery store hires actors to pose as customers and covertly test the employees on their quality of service. Employees try to pick up on subtle actions from customers to tell if they're acting or not. While it helps them on their audits, the effort of picking up on these subtle actions during every customer action takes their attention away from the needs of real customers.

> Example. Three men tried breaking my bike lock with a car jack. They failed, but the lock could no longer be opened, and I had to call a locksmith. As I waited by the bike racks for the locksmith to arrive, a lady parked her car nearby. She got out of the car and started walking around it, talking to herself rather loudly. She opened the trunk and the hood, and walked back and forth between them a few times. It seemed like she was pretending to work on her car without making any real progress. I needed to wait there for the locksmith to arrive, and endured the entirety of her performance. The intrusion attempt and the performance were both highly unusual in my daily experience, so I was skeptical that the concurrency was by chance, but it was difficult to believe the whole event was contrived.

Perspective The observer can integrate personal experiences with the environment that would otherwise have no relation. An environment can be a patchwork of different places and times, so long as the observer is aware of both of them. Making arbitrary decisions about what comprises the environment can help draw important relations, but also introduce subjectivity. A cause emerges, that being the tendency of the observer to look in some places and not others.

> Example. I worked from home and was thinking about getting a folding room divider, like the Japanese kind. The next day I walked past such a room divider on the street, sitting in a free pile. I stopped and considered carrying it home. Just then, a car pulled up, and someone got out to pick it up. It looked just like one I saw a few years ago at a depot for creative reuse.

The coincidence that I considered getting a room divider the day before seeing one on the street was one that no one else could notice, and relied on me joining two environments in a more arbitrary way than just watching the scene unfold. The coincidence that someone else picked up the room divider right after I saw it could have been observed by a neighbor. The environment was contained within a simple, continuous physical environment.

Familiarity Consider the things in an environment as a set of elements, and arrange them by how likely each one is to assume the state of an object. Imagine them on a circular plane, and place the most likely closest to the center. Call these familiar, and place less familiar things near the edge. The observer defines their environment by the inclusion of things that are at least somewhat familiar, and then orders them by their familiarity. If a thing that typically resides near the edge tends to assume the state of an object more often, it becomes familiar, and moves closer in.