Remembered-Thinking-Theory

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Abstract

This investigation isolates remembered-thoughts as a means of contemplating the structure of thought, specifically by interweaving the concept of certainty into the concept of remembered-thinking, and representing each logical argument mathematically as well as in verbal-form. The paper contemplates mental methods for predicting the accuracy of a memory of an external observation at varying points in the future, in terms of evidence the theory hypothesizes the mind has evolved to perceive, and theorizes about how those same methods must carry-out when turned to memories of internal observations. The theory concludes that introspective contemplation drives perception to perceive concepts as perfectly-persistent in time and perfectly-relatable to other concepts, often to a degree of infinite (timeless) existence and infinite-relatability, and demonstrates a correlation between this phenomenon and the establishment of perfect belief in concepts. The paper presents a comparison between the reality of this perfection and the inherent imperfections that exists in the universe described by special relativity, and based on this comparison defines knowledge as an entity that oscillates between conceptual perfection and real-world imperfection.

Introduction

How can conscious minds really know that they had the thoughts they remember having? What they have is the memory of the observation of the thought itself, either a stable object, like a colour or a familiar face remembered to have been brought to mind time and again, or a one-off thinking event remembered as a sudden insight, a final decision, or some other newly mix-and-matched set of concepts. Memories-of-thoughts are all the evidence conscious minds have of thought objects and events. Unlike memories of observations of external-objects, there's no way to return to the object and reconfirm the remembered-features, and unlike memories of observations of external-events, there's no residual event-effects reverberating into the future that offer evidence substantiating or unsubstantiating the remembered-details.

Axiom

The evidence substantiating or unsubstantiating the accuracy of a memory-of-a-thought is finite the moment the memory is created, and sourced solely from the thinker themselves. Remembered-thinking-theory is built entirely off this axiom.

Values

An internally experienced memory is a unit defined by the beginning and end of the reflecting mind's attention, which creates temporal boundaries around the unit. Conscious minds build their picture of the external world through units-of-memory that are like windows along a hallway that minds walk whenever they are reflecting on their memories and memory-built-knowledge. If that picture is of a forested landscape, then those windows may present one tree here, a collection of trees there, and an assortment of undergrowth and animals. Each window provides only a segment of the forest, but the knowledge gained is not segmented itself. The mind recognizes that in between each window are many unseen trees, animals and undergrowth. The mind's picture of the forest is built from familiarity and previous knowledge that allows the mind to quickly form hypotheses and conclusions: when three successive windows present birch trees the mind will hypothesize-and-conclude that out there is a stand of birch trees; when each passing window presents a squirrel in an oak tree ever focused on an opening in the trunk, while occasionally looking suspiciously from side to side, the mind will hypothesize-and-conclude that the squirrel has a stash of acorns in the opening; when the mind sees moving water with each window representing a glance to the left, and each window relaying a left-sourced-sound of moving water, it will hypothesize-and-conclude that to the left is a river, that between each left-glancing-and-listening-window is an unbroken continuity. The most important

categories of hypotheses the mind makes for building its picture of the world is of repetitions in events and continuities in objects.

Every conscious mind comes to understand the benefits of their capacity to hypothesize and conclude about connections between objects and events observed through the windows and those that are unseen, but at the same time they inevitably come to understand the fallibility in what they conclude. A picture of the world is easiest to manifest when it consists of repetitions that repeat perfectly, when it exists in a completely knowable environmental context, and when it consists of continuities that are never deformed at any point in space or time. When three birch trees guarantee the presence of a stand of only birch trees, when squirrels that are focused and suspicious are always squirrels preoccupied by acorns, and when rivers are always rivers, and never slow to a lake or wetland, minds can indulge in what's possibly their favourite emotional state, a feeling of perfect certainty. Unfortunately, this is not the universe the mind ever experiences. What the mind comes to understand is that the connections between what's seen in the windows, and what's unseen between them, are too numerous, imperfect and deformable to ever truly present perfection.

Often a conscious mind will go ahead and assume perfect repetitions and continuities to exist anyway, sometimes just to indulge in the false-sense-of-perfect-certainty, but the difficulty with the external world is that their observations are never the only source of evidence substantiating or unsubstantiating a conclusion. First, those unseen objects and events may become seen in the future, so that a later-seen map showing that a river does in fact slow to a lake falsifies a belief in the river's perfect continuity, or a stand of birch trees experienced many years later exhibits the occasional alder, so that now the mind must be

suspicious of whether that presumed purely-birch-tree-stand experienced long ago was really that. Second, other conscious minds are forever available to provide new evidence, so that perhaps one day a mind meets an ecologist specializing in squirrel-tree-interactions, who informs the mind that squirrels have object-interests that go well beyond just acorns, and now the mind must acknowledge that maybe there was some other kind of food, or something else entirely, in that hole in the tree. And third, minds come to recognize that those windows to the external world eventually crack, fog, and become opaque if the mind does not refresh their observation of that part of the universe, and so their certainty in their conclusions too cracks, fogs and becomes opaque.

With every step forward in time, the more unseen events and objects have the chance to come into view, the more other conscious minds have a chance to present evidence that challenges, and the more distant and opaque becomes the initial memories that originally gave a sense of certainty in a mind's conclusions; eventually all knowledge gained from observations of external events and objects becomes just as likely to be true as untrue. This gives the theory its first value: $P_{external}(t) = 0.5$

where $P_{external}$ represents the probability that a memory is accurately representing an observation of an external event or object, and t is a value of time that is big enough to account for the eventual degradation of certainty.

Imagine that on the other side of the hallway are a similar row of windows, but this time the windows represent memories of observations of a conscious mind's own thoughts. These thoughts might also be of a forest, but in this case the forest would be an imagined happy-place that a mind manifests every time they feel

they need a little escapism. In this forest are stands of only birch trees, squirrels forever obsessed with acorns, and rivers that run exactly as expected all the way to the ocean. On one imagining, a mind may realize that they visualized a waterfall downriver from the birch stand when last they imagined it upriver, but this kind of discrepancy only ever happens for recently remembered thoughts. The more distant the window a mind hypothesizes to match the presently seen window, the easier it is to believe with perfect certainty that the two windows match perfectly. This point is worth a deep exploration, and, when contextualized under the axiom, will ultimately lead to the final equations of remembered-thinking-theory, but for now it will simply provide another value: $P_{internal}(t) = 1$ where $P_{internal}$ represents the probability that a memory of an internally observed event or object is accurately represented, and t represents a value for time large enough for a mind to feel perfectly-certain in the memory.

Equalities and inequalities

There are two types of certainty that thinkers experience: subjective-certainty and objective-certainty. An example of each has already been presented, but without the terminology. When the forest walker manifested perfect-certainty in a stand of purely birch trees, a population of acorn-only obsessed squirrels, and a river that remains perfectly river-like all the way to the ocean, they exercised their subjective-certainty, a certainty in the accuracy of their memories and conclusions that relies on nothing but their own subjective-opinion. It was shown in the example that the thinker can never fully escape objective-certainty, that certainty of the accuracy of their memories and conclusions that takes into account all available evidence, past, present and future. Objective-certainty takes into account a probability that unseen objects and events, other conscious minds, and the degradation of observation-memories will substantiate or unsubstantiate the accuracy of memories and conclusions to various degrees at various points in time. A conscious mind can turn a blind-eye to objective-certainty temporarily, but inevitably objective-certainty will break the sometimes indulged feeling of perfect-certainty that subjective-certainty can manifest.

Consider once again the windows that represent memories of observations of a mind's own thinking-in-action. As an experience that this theory assumes comes later in cognitive evolution, and later in cognitive development, it also assumes that a first-

awareness of a memory-of-a-thought would incite a similar response as an awareness of a memory of an external event or object: the mind would recognize that the longer-ago the observation of a thought that's being remembered, such as the first imagining of the happy-place-forest, the less likely that the memory would be accurate, a recognition that would feel to awareness like a vagueness or faintness inherent to conclusions about the remembered-thought. Was the fantasy-forest really imagined for the first time for escapism, or was some other emotional state, forgotten because it was only relevant to that time, driving the fantasy? Was the initial fantasy, imagined so very long ago, even of a forest, or did the forest evolve from something else entirely? The lack of accuracy would also initially affect certainty in what connections the thought has to other internal information processing. A sense of hunger may be concluded to have arrived with the imagining of dinner, but as time goes on a mind could sensibly question whether the imagining of dinner was brought on by a sense of hunger. This phenomenon, however, turns on its head at that point when objective-certainty comes into consideration.

There is no chance of those unseen, subconscious-processings from long ago to reappear and break a mind's certainty, and there is no other conscious mind who may one day bring unknown evidence to challenge that certainty, as long as the thoughts were never externally expressed. The only real challenge to a mind's certainty is that self-imposed question of whether a long ago thought is still remembered accurately. If a thinker decides yes, their memories are perfectly accurate; in other words, if they manifest perfect subjective-certainty, that subjective-certainty immediately becomes the measure of objective-certainty. At this point in the arguments an important mathematical symbol must be put in the spotlight: the = sign, because in the case of the two types of certainty, when

the question is about the accuracy of a memory of observed thinking-in-action, subjective-certainty = objective-certainty.

The = sign is important to highlight because in the case of the accuracy of a memory of observed external events and objects, it's always the case that objective-certainty puts subjective-certainty into question, that subjective-certainty ≠ objective-certainty, which is a quality indicated by $P_{external}(t) = 0.5$ – the quality that is the inevitable decline in likeliness that memories are accurate, to the point where they are no longer worth remembering. Theoretically, subjective-certainty could equal objective-certainty in a single instance, but this capacity is insignificant for this comparison to the opposing equality within the internal which has persistence in time. This is the first but not the last time that the signs = and ≠ come to differentiate the internal and the external. Once remembered-thinking-theory is fully explained, it will be clear that this is always the case, and that it contains a deeply significant meaning.

Because a thinker's subjective-certainty in the accuracy of their memories-of-thinking is equivalent to the objective-certainty of that accuracy, they are free, at the point following initial awareness, to manifest perfect-certainty in their analysis of the accuracy. This fact does not dismiss the significance of the initial awareness, which was argued earlier to begin with the same questions of accuracy as for external events and objects, resulting in a vagueness or faintness to the analysis. Presuming the happy-place-forest thinker does come to have perfect-certainty in their memory of that long-ago inception of the fantasy, that greater uncertainty, or vagueness, present in the initial awareness, retrospectively becomes nothing more than the presentation of a greater list of options for what memory the thinker will have subsequently remembered with perfect-certainty. In the case of the

happy-place-forest-fantasy, a likely forerunner option is a memory that matches perfectly with the most recently-remembered-fantasy. The conclusion of that argument is that if the happy-place-forest-thinker wants to believe that they are imagining a forest perfectly the same as in a previous imagining, they will find the task easier the longer ago was the inception of the compared-to-imagining. This conclusion about remembered-thinking is significant, because just as a mind is free to manifest any level of subjective-certainty in the accuracy of their memories-of-thinking, they are equally free to manifest any sense of age that a recurring thought may have had, since that knowledge is itself a potentially unexpressed thought with an objective-certainty in its accuracy that is equivalent to the subjective-certainty in its accuracy. This final point is one basis for the final equations presented in the theory, but before it's explored more deeply and mathematically, a second point about equivalencies must be made.

The second reason that the = sign and the ≠ sign represent the internal and external is because of the inevitable imperfectness of repetitions and deformableness of continuities over spacetime, in all of both common and scientific observation. This fact about the external universe is held true by Einstein's historic defense. Einstein's experience with physics gave him the wisdom to know that there are no rigid bodies in space, that everything is deformable and alters with temperature, and that there's no truth to the idea that two objects can have surfaces that touch, (Einstein, 1916). Einstein pointed out that it's easy to believe that the forces acting on an object like a rigid rod will affect the whole rod at once, but this perspective is only sustainable for rods that exist on the spatial scale that humans occupy. Imagine a rod that is a light-year long, one that is as rigid as anything in the universe could be, perfectly rigid if that's possible. But is it? If a force where to act on one end of the rod, instantaneously moving the other end, one

light year away, that would constitute the transmission of force, and information about the force acting on the rod, at a speed faster than the speed of light, and that is impossible, (Einstein, 1905, 1907, 1911).

What this means is that in the universe there is no continuity in any object in space or time. So any identity a conscious mind gives to an object, given that that identity is meant to be the same here and there, now and later, is a simplification of what they're really looking at: a piece of the universe evolving, changing, unpredictably manifesting new forms of never-seen-before being. This fact provides supporting evidence for Einstein's belief that events as he understood events, as all those connections between things, are only conceptual interpretations of something more complex and unpredictable; because if the objects exhibiting the relationships themselves are not stable enough to be identified as a persistent thing, then the relationships between them are even less able to be identified as a persistent thing (Einstein, 1917).

What about perfect iterations of the same event, is that never possible even in the case of subatomic or interstellar observations, where events appear to simplify into perfectly cyclic phenomenon? Science seems to forever discover glitches and wabbles in whatever it first presumed to cycle perfectly, but Einstein introduced a more fundamental problem in presuming the possibility of a perfectly repeating event. To conclude that an event repeats perfectly, with objective-certainty, would require agreement between observers, but Einstein disproved this possibility. First, it's objectively impossible for an event to appear perfectly the same for multiple observers, in other words, for the concept of simultaneity to exist in the universe, which is a foundational proof presented in that paper that introduced special relativity. Second, because special relativity proved that objects

interact dynamically with time the same way they do with space, it also proved that there is no such thing as a present-moment objectively-confirmable by multiple-observers (Einstein, 1905). This is why Einstein states, "Since there exist in this four-dimensional structure no longer any sections which represent 'now' objectively, the concepts of happening and becoming are indeed not completely suspended, but yet complicated. It appears therefore more natural to think of physical reality as a four-dimensional existence, instead of, as hitherto, the evolution of a three-dimensional existence," (Einstein, 1916). It's only in the evolution of a three-dimensional existence that perfect repetition has even a theoretical possibility, but that three-dimensional existence is a fantasy established for the human animal because, "The earth's crust plays such a dominant rôle in our daily life in judging the relative positions of bodies that it has led to an abstract conception of space which certainly cannot be defended," (Einstein, 1921b).

The relevance of the imperfectness of Einstein's universe to remembered-thinking-theory is that it shows how wondrously peculiar it is that perfection is manifested in the mind, in a universe where no such thing should exist. This capacity is what the theory explores deeply and mathematically in the following sections, but this section simply needs to end by mathematically defining these equalities and inequalities. The expression $ME_1 \neq ME_n$ – where ME represents memories of observations of the external and n represents any number other than 1 – states the impossibility of an equality between two or more memories of external events or objects because of the steady decline in the probability of accuracy of memories of external observations; as well as by the fact of the imperfectness of the universe relativity-theory describes, in other words, by the impossibility of the universe even offering up such material to begin with. That

wondrously peculiar capacity of the mind to remember a most recently remembered-thought as perfectly matching a previously remembered-thought, or any number of iterations of the same thought, with objective-certainty is represented mathematically as $MI_1 = MI_n$ – where MI represents memories of observations of thinking and n represents any number other than 1 . Remembered-thinking-theory also proposes that this equation represents a definition of what a concept is, a point that is thoroughly explored in the next section.

A mathematical definition of concepts

No concept exists as internally perceived in the external universe, and here are the reasons why: observed external events never repeat perfectly, and observed external objects never exhibit perfect continuity. Conscious minds are capable of perceiving perfect repetition and undeformable continuity for a time, but eventually all minds must face the objective reality that challenging-evidence will reveal itself in the form of unseen-objects-and-events becoming observable, and other conscious minds revealing their own observations, so that perfection becomes imperfect once again. Despite this frustrating reality, conscious minds have a reprieve: the conceptual landscape.

In the internal world there exists a special kind of object and a special kind of event. Events that are internal revelations or life-changing decisions don't dissolve into atmospheric and electromagnetic substrates like lightening strikes, but are perfectly-recollectable for a life-span, and may even represent to the mind an infinitely-applicable truth. The objects, although they don't exist in the external, often draw their identity from the external. All the observed individual trees in the world have fed the concept of tree, all the observed squirrels in the world have fed the concept of animal, and all the experienced rivers in the world have fed the concept of a hydrological system. In conceptual form, these objects are no different than any abstract, like honor, faith or Euclidean Geometry. In conceptual form, tree far exceeds the known life of

any species of tree; the concept has no recognizable beginning or end for a conscious mind. In conceptual form, animal is not bound to the parameters of a particular branch of life, or to life at all, because in metaphorical form it can embody animalistic behaviour, an animated drawing, or a mythical beast. In conceptual form, a river can not only run all the way to the ocean without ever slowing to a lake or wetland, but it can run all the way to the end of the universe. But why? If such perfection does not exist in the universe, if all things have connections to other things that are limited to contextual parameters, and if nothing has the luxury of experiencing unbounded-time, then how is it concepts even exist?

Remembered-thinking-theory does not answer this question, the question of the origin of concepts, or why conscious minds are granted such a special power. This investigation conforms only to the theory of evolution and the universe described by special relativity theory, but while evolution and relativity can model the reformation of material and energy that already exists, they're not necessarily adequate for explaining the manifestation of something that seems to go against the very nature of the universe. Remembered-thinking-theory leaves unanswered the question of why a mind is capable of manifesting perfection, eternal existence, and infinite-relatability, but what the theory does offer is a proposed explication of exactly how this manifestation tool works from a logical and mathematical point of view.

Remembered-thinking-theory states that the fundamental element of a concept is $MI_1 = MI_n$, and now introduces M_xI, where moving the subscript to the M is introduced as a convention for representing a concept legitimized by its perfect-persistence across at least two remembered-thinking experiences. The character and

feel of a concept are explained by how the mind comes to perceive this perfection.

The longer ago the inception of the concept compared to the most recent recollection of the concept, the easier it is to perceive the two memories as perfect replications of each other. What is the connection between a visceral feeling of certainty and the perception or knowledge of persistence? If conscious minds perceive an object or the recollectability of an event as persisting perfectly from the past to the present, they will predict that that object or knowledge of that event will similarly persist into the future. This is an acknowledgement of reliability, and the quality of reliability is deeply connected to the visceral feeling of certainty. But the connection goes further once a second layer, a far more often perceived layer, of the conceptual landscape is taken into account.

Consider this phenomenon in terms of a conscious mind's complete conceptual landscape. A conceptual landscape is a picture of all the different thought-units that a mind has at some time, and will at some time again, recall as a concept that is perfectly-persistent, that has an undeformable-continuity. For language speaking animals this landscape is vast and diverse, filled with conceptual representations for many observed external species of things and for many examples of iterating events, as well as many unobservable abstracts. This landscape is also filled with emotions, not those emotions deduced to have existed because they explain some self-observed-behaviour, but those that a conscious mind can manifest as a unit-of-experience for the sake of internal contemplation. The landscape is similarly filled with experiences-of-awareness, not the awareness that absorbs event reverberations into the neurology so that the subconscious can navigate behaviour regardless of how much conscious awareness

an animal is experiencing, but the awareness that results in conscious minds seeing what they're seeing as a unit-of-experience, hearing what they're hearing as a unit-of-experience, or perceiving a particular identity in the external through their senses, but as a unitized person, object or event, stabilized through conceptualization, so that they can contemplate the unit in relation to unitized feelings, thoughts or other experiences-of-awareness.

With a landscape of M_xI's established, a conscious mind can now recall an M_1I and consider its relationship to an M_2I. If an M_1I and an M_2I are established as perfectly-persistent through an equivalency with their own iterations, then they also have the capacity to not only exhibit a relationship, but to exhibit a relationship that is itself perfectly-persistent, and representative of an undeformable-continuity.

If a lightening-strike is always perceived to be a destructive, fire-starting force, and a forest is always perceived to be a dry, fire-vulnerable forest, then the perceived relationship between the concept of a lightening-strike and the concept of a forest is that the one will always annihilate the other. The important distinction between these conceptual relationships, and their external equivalents, is that in conception they really do represent a perfect equivalency, whereas in the external they only represent a mostly-true-statement, at least in terms of objective-certainty. Here remembered-thinking-theory intersects with a most famous epistemological statement made in Einstein's *Geometry and Experience*, which in part presents a sum-total of his thoughts and statements against perfect-rigidity, undeformable-continuity, and totally-comprehensible external-relationships: "At this point an enigma presents itself which in all ages has agitated inquiring minds. How can it be that mathematics, being after all a product of human thought which is independent of experience, is so

admirably appropriate to the objects of reality? Is human reason, then, without experience, merely by taking thought, able to fathom the properties of real things?

"In my opinion the answer to this question is, briefly, this: as far as the propositions of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality." (Einstein, 1921a).

What if the lightening strike in question is no ordinary lightning strike, but that all powerful weapon held by Zeus? In this case the mind could perceive a perfect causal relationship between the concept of lightening and the conceptual annihilation of a home, a city, or an entire continent. A logical argument was introduced previously to defend the idea that the longer ago the inception of a remembered-thought, the easier it is for a mind to perceive a perfect replication in the most recently remembered iteration of the thought. This same logic is applicable to the relatability of a most recently remembered concept, say that of Zeus's lightning, and a set of concepts successively analysed for their relationship to that initial concept: the less objective-certainty, or more vagueness, the related-to concept has upon first-awareness, the more versions of the concept, the more capabilities to relate, the mind can ultimately come to perceive with perfect-certainty. Awareness will perceive more vagueness the longer-ago the compared to concept was last remembered, such as the vulnerability of a not-often-thought-about-country to Zeus's lightening strike, or for concepts that are further down the imagined list of potentially-relatable-concepts. At the point when objective-certainty comes to equal subjective-certainty, the more in-frequently-remembered and further-down-the-list related-to concepts are, the easier it will be to perceive the relationship precisely as hypothesized.

Just as a concept comes to be perceived as a continuity, that relationship, such as the destructive power of Zeus's lightening, will come to be seen as a continuity independent of the lightening or annihilated objects themselves. At this point, when pondering what objects Zeus's lightening is capable of destroying, a conscious mind can comfortably decide, "anything and everything". A concept, therefore, has a second means of exhibiting perfect-persistence and undeformable-continuity, in addition to its persistence through time: its capacity to relate to a set of other concepts, or even just its capacity to relate.

This gives a new way to understand the relationship between the visceral feeling of certainty and the perception or knowledge of persistence: in addition to a concept exhibiting reliability by nature of its capacity to persist with perfection into the future, it now also exhibits a reliability in its capacity to relate perfectly to other concepts, either causally or through some other type of relationship, a relationship which itself is capable of an independent existence that is perfectly-persistent and undeformably-continuous. Together, these two reliable qualities – a concept's perfect-persistence in time and perfect-relatability to other concepts – are so powerfully connected to certainty that remembered-thinking-theory defines this experience of certainty as an experience of a concept's truth and value. Because of the finiteness and sole-sourcing of evidence that substantiates this conceptual landscape, the truth and value identified here is completely embodied in the conceiving mind, in that visceral sense of certainty, and therefore is further identified as the nature of belief. Perfect-belief, according to this definition, is what the probability value truly represents in the summarizing equation $P_{internal}(t) = 1$, and is synonymous with the idea of perfect-certainty in a concept.

The following section will unpack $P_{internal}(t) = 1$ by thoroughly analyzing the compounded relationship that was just introduced, using a new term: conceptual-expanse. Conceptual-expanse compounds the measure of a concept's capacity to persist perfectly through some quantity of time and relate perfectly to some number of other concepts into a single value. Because a concept's expanse equates to greater persistence, which equates to reliability, which equates to a visceral sense of certainty hypothesized to represent truth and value to such a degree that the theory defines belief by this sense of certainty, the theory here uncovers its most significant discovery: a correlative relationship between a concept's perceived expanse and the capacity of that concept to inspire belief. This is the correlation that is described by the final equations of remembered-thinking-theory.

The Theory

The first mathematical statement made was that $P_{external}(t) = 0.5$ where $P_{external}$ represents the probability that a memory is accurately representing an observation of an external event or object, and t is a value of time that is big enough to account for the eventual degradation of certainty. What is missing is an expression that shows just what happens as t approaches a value big enough for $P_{external}$ to equal 0.5 . The expression $P_{external}(t) = 0.5 + 0.5 \times e^{-\lambda t}$ gives the opportunity to set a rate at which $P_{external}$ degrades from 1 to 0.5 using the common decay function $e^{-\lambda t}$. In this function e is the constant known as Euler's number, t is a value for time where an increase in 1 can represent an increase in one day, one week, one year, or any other unit of time, and λ (lambda) is a value that will either have the function decay quickly or slowly. The value of λ is what's important to focus on because this value is what represents the probability that a memory of an external event or object will be accurate at a particular point in time, or particular value of t . It reflects the measure of what challenging evidence is predicted to be faced at that time because of the appearance of previously connected but unseen objects and events, new evidence from other conscious minds, and the degradation of memory and knowledge that will have to be accounted for at that point.

As an example, consider the forest-walker's capacity to remember details about the forest as time progresses away from their

experience. The possibilities for degradation discussed were the later appearance of maps or iterations of similar tree stands that present challenges to the walker's conclusions, other conscious minds with more specialized knowledge that could challenge their assumptions, and the reality that their own memory of the forest would degrade unless the forest was revisited. Assume that an analysis of these factors results in a value for λ of 0.8 , given that a value of 1 for t is equivalent to one year. The results will predict that after one year the walker's knowledge of the forest will have a 72% chance of accuracy, after two years, a 60% chance, after three years, a 55% chance, and ten years following the experience of the forest, a 50% chance of accuracy, meaning the prediction is that the knowledge the walker will have is just as likely to be true as untrue.

A similar equation can represent the argument that memories-of-thinking eventually achieve a 100% chance of being accurate: $P_{internal}(t) = 1 - e^{-\lambda t}$, or $P_{M_xI}(t) = 1 - e^{-\lambda t}$, where M_xI not only indicates a concept legitimized by its persistence, but where x could represent a group of concepts embodied by a set-of-knowledge. If the same values are used, the results are one year equals 55% accuracy, two years equals 80% accuracy, three years equals 91% accuracy, and ten years equals a number very close to 100% accuracy. These values clearly don't reflect actual outcomes of conceptual thought, but that's because the value of λ is not the significant factor in describing a conscious mind's movement towards belief. With $P_{external}(t)$, the λ value represented the measure of objective-certainty, which was the most significant factor in a conscious mind's perspective of the probability of the accuracy of their memories and conclusions about external objects and events. With $P_{internal}(t)$, or $P_{M_xI}(t)$, t is the most important factor, because it determines the measure of time during which the concept is believed to have persisted perfectly. In other words, it's

not objective-certainty that affects belief in a concept, but a visceral sense of familiarity, a sense of familiarity that makes concepts feel known.

If t is allowed to initiate at a value higher than a starter value of 1 , then it can also model how a mind recalls a perfectly persistent concept in an isolated thinking-event. Afterall, a mind that has no attention on memories-of-thinking, or that is simply asleep, is wholly part of the imperfect universe, evolving through an infinite-heterogeneity of new states. So the subconscious elements that seed a consciously-aware, introspective thinking-event can't possibly be the exact same as those that seeded previous thinking-events that the mind will nevertheless come to believe contained perfect replications of currently-conceived objects and events. However, what those elements can arrive with is a visceral sense of conceptual-familiarity that instructs the consciously-aware mind to reverse-engineer from those elements, to a degree consistent with the sense of familiarity, or value of t , concepts that have *that* length of existence in time and *that* capacity to relate to a set of other concepts. From there the mind manifests a sense of certainty, or belief, in the capacity of those concepts to persist perfectly across remembered-thinking-events.

So, in the case of $P_{M_{xI}}(t)$, λ is left as an arbitrary gauge determining to what degree an increase in familiarity with a concept increases belief in that concept. Instead of being arbitrary, this value could represent a measure of a mind's sense of confidence in their own capacity for conceptualization, and that measure could cross over to $P_{external}(t)$ for that same mind as an additional factor for determining their objective-certainty, or λ, in the accuracy of their memories of external observations. This level of modelling is more nuanced than the foundational elements this paper intends to represent mathematically, and less one-to-one representative of the

theory, but the concluding section of the paper will make clear that a conduit such as this between $P_{M_xI}(t)$ and $P_{external}(t)$ is important for deriving from the theory a complete picture of human knowledge.

Returning to the foundational elements, there is one more pertinent quality of $P_{M_xI}(t) = 1 - e^{-\lambda t}$ that the theory proposes is illuminating: no matter how large the value of t , whether it represents hours, days or years, P never quite reaches 100% accuracy. In mathematics, the 100% , or a P value of 1 , that is never quite reached, despite values that get very close, is described as a limit. The same equation presented above in limit notation looks like this: $P_{M_xI}(t) = \lim_{t\to\infty}\left(1 - e^{-\lambda t}\right)$. Translated into verbal form, this says that perfect belief in the truth and value of a concept is achieved only when the concept is perceived to have an infinite-existence in time, and infinite-relatability to an infinite-set of other concepts. This statement happens to agree perfectly with remembered-thinking-theory's proposed idea that concepts, like "tree" or "honor", have no temporal beginning or end, and that concepts like Zeus's lightning can relate to an infinite-set of other concepts, like Zeus's lightning's capacity to annihilate anything and everything. Going forward, in the case of mathematically describing concepts, limit notation is applied because of its value in accurately describing the phenomenon.

A problem with the single equation above is that it describes a unidirectional correlation, which says that conscious minds that allow themselves to perceive a concept as having a greater and greater expanse will feel a greater and greater level of certainty and belief in the concept, but the theory proposes that the correlation goes equally both ways. Here is a second equation that shows how a new perception of a concept's expanse can result from the first equation's ratcheting up of a conscious mind's level

of belief: $\left(T_{new} \circ P_{M_x I}(t)\right) = \lim_{P_{M_x I}(t) \to 1} \left(\frac{1}{1 - P_{M_x I}(t)}\right)$. Translated into verbal form, this says that as conscious minds achieve greater belief in a concept by perceiving the concept to have a greater expanse, that greater belief in the concept itself fosters a perspective of the concept's expanse as shooting towards infinity. This mathematical exploration indicates a positive feedback loop that is completed by a third equation which simply says $t = T_{new}$, so that the equations can run again with the increased value in t. The positive feedback loop results in an exponential increase in the perception of a concept's expanse, and a sprint towards its capacity to inspire perfect-belief.

Conclusion

The final equation of remembered-thinking-theory says concepts that manifest perfect-belief and inspire a perception of timelessness and infinite-relatability are a comfortable and self-fulfilling outcome of conceptual-thinking. They're a force that drives towards perfection those knowledge-sets that conscious minds reflect on, and that affect their states-of-perception. This force-of-conceptual-thinking is opposed by experiences of external events and objects that keep a reality check on the hypotheses and conclusions embodied by a set of knowledge.

Consider these forces in terms of the window analogy. While the conceptualized continuities on the memories-of-internal-observations side fill in the gaps between the windows on the memories-of-external-observations side, external observations of individual iterations of events and individual appearances of objects forever call into question the continuities uniformly reappearing in the windows on the memories-of-internal-observations side. Therefor the final conclusion of remembered-thinking-theory is that knowledge-sets that conscious minds reflect on, and that affect their states of perception, are less-so definable as a static mix of abstractness and concreteness, and more-so definable as an oscillation, where they ascend towards perfection, then disintegrate into uncertainty, forcing minds to either rebuild or abandon that knowledge to the infinite-heterogeneity of the universe.

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