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International Journal of Current Research
Vol. 8, Issue, 02, pp.26340-26348, February, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

REVIEW ARTICLE

SPINOZA: COMPARATIVE RESEARCH AND PHILOSOPHICAL VIEW OF EMPIRICAL FINDINGS IN CONTEMPORARY BEHAVIORAL SCIENCES

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ARTICLE INFO

Article History:
Received 08th November, 2015
Received in revised form
27th December, 2015
Accepted 23rd January, 2016
Published online 14th February, 2016

Key words:

Compare, Biases, Conscious,
Image, Knowledge.

ABSTRACT

Research into decision making is a most important issue today in behavioral science. Individuals are organisms yearning to exist and constantly making innumerable judgments and decisions, consciously or unconsciously. This research proposes to compare Spinoza's behavioral theory "Ethics" with modern research findings, presented by Nobel-prize winners Tversky and Kahneman in "Thinking, Fast and Slow" and "Judgment under Uncertainty". "Representativeness" and "Availability" as error causes of Tversky and Kahneman's System 1 are parallel to Spinoza's Kind I – "Inadequate cognition". For Spinoza's Kind II - "Adequate cognition", modern research finds a solution in System 2 - slow and logical, that must constantly be refined and activated. Spinoza pioneered the systematic analysis of human behavior. His self-description from 350 years ago is endorsed by current empirical research. This research aims to present the relevance of Spinoza`s behavioral theory today.

Citation: **Abraham Mounitz, 2016.** "Spinoza: comparative research and philosophical view of empirical findings in contemporary behavioral sciences", *International Journal of Current Research*, 8, (02), 26340-26348.

INTRODUCTION

Decision making has been studied by philosophers since antiquity, and has recently become one of the most important subjects in behavioral sciences, particularly in cognitive psychology. The aim of study is to present a comparison between Spinoza's behavior theory as seen in his *Ethics* (Spinoza, 2002a) and the results of modern day empirical research in the work of Nobel Prize winners Tversky & Kahneman (1974) and in Kahneman (2012). The comparison will focus on Spinoza's discussion of 'knowledge of the first kind' (opinion and imagination) and 'knowledge of the second kind', the reasonable, controlling dimension of Spinoza, "Knowledge of the second […] kind, not knowledge of the first kind, teaches us to distinguish the true from the false" (Spinoza, 2002a, p. 268), and the associative judgment of System 1 (representativeness and availability) and the lazy, slow effortful System 2 of Tversky & Kahneman. They, like Spinoza, define the workings of the two systems as follows System 1: Works fast and automatically, with little or no effort and no conscious control. System 2: allocates necessary attentiveness to effortful mental processes and involves complex calculations. The actions of System 2 are often connected to the subjective experiences of man: choice and concentration as expressed by Stanovich & West (2000). Individuals tends to avoid information when they feel that it isn't suitable their wishes to obtain or it isn't the right time to handle with (Shani & Zeelenberg, 2012). Gilbert (2007) identifies System 2 in modern research with Spinoza's reflection He also describes a situation where decision-making ability as described by Spinoza is absent. The parallel lines between Spinoza's idea and modern empirical findings are also observed in the philosophical discussion itself, when concerned with Spinoza's approach to uncontrolled imagination and memory (Katz, 2014; Bar-Elli, 2007). Spinoza's theory of levels of consciousness reflects our orientation in reality. Spinoza's challenge is to enhance a person's abilities on the levels of consciousness that are parallel to his orientation in reality (Ben-Shlomo, 2012). From a philosophical viewpoint imagination and memory are the representatives of products of external space and time influence (Mounitz, 2012) and Man's internal awareness could construct a barrier between images and reality (Bennet, 1984). Another philosophical discussion regarding time as an unrealistic image, from the past into the future as an erroneous way of perceiving reality emanates from perceiving reality as duration. This perception involves the imagination of the material as an extension with a duration memory beyond the

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present (Dugdale, 2001). The illusion of time as the result of man's perception of self in relation to external bodies as a relative association connected to the state in which the person finds himself. For example, in a state of boredom time tends to crawl, whereas when a person is in a state of enjoyment it passes quickly, and these too as the basis of the error (Gilead, 1986; Waller, 2010). It should be noted that as far as this article is concerned, the discussion is empirical (not metaphysical) and relates to behavioral aspects. Contemporary empirical research maintains that the world that exists in our consciousness is not an exact copy of reality but rather of views and images which were captivated by the heuristics of emotion (Slovik & Fishhoff, 1982). These are findings that substantiate Spinoza's statements from 350 years ago. System 2 has the ability to take control of System 1, rejecting its associations and urges, and systematically building up ideas and thoughts within a controlled attentive mental process, but this does not mean System 2 is never mistaken and it is not always the perfect example of rationality. Its abilities are limited but it reflects our best ability. Kahneman (2012) maintains that System 1 too is not always mistaken, and may sometimes be correct. Its advantage is faster reaction where normal events change to unexpected even (Tversky & Kahneman, 1974). Schneider (2014) argue that Spinoza`s "Principle of Clear and Distinct Representation" explains absolute eternal truth – a truth grounded in the nature of representation – a principle of representation as a power or causality that belongs only to real things.

Levels of Knowledge

Kahneman (2012) explain how System 1 gives the impression of familiarity despite the lack of affinity between the object in question and the known stereotype. When this feeling of familiarity seems relevant, the 'lazy' System 2 relies on this impression and remains inactive and uninvolved. Similarly, when the memory is not fully available System 1 tends to present an alternative availability. Even though the credibility of this availability is inadequate, in the eyes of (the 'lazy') System 2 this alternative is better than nothing at all, as it serves to protect the self from embarrassment or other negative feelings. By the same account, from biases in availability emanate "biases due to the retrievability of instances" and "biases due to the effectiveness of a search set"(Tversky & Kahneman 1974, p. 11). The discussion of the workings of a Type 1 system in Spinoza's *Ethics* stems from the idea of Imagination. He explains the reasons for its incompatibility with reality. In part 3, proposition 14 he says: "If the mind has once been affected by two emotions at the same time, when it is later affected by the one it will also be affected by the other." Only Type 2 knowledge, as in part 2, proposition 42, allows a distinction between true and false perception. He reinforces this statement in part. 2 proposition 18 and in proof of part 3, proposition 14. Spinoza is referring to Type 1 that will behave in this way as long as Type 2 does not come into play and remove the dominant impressions of Type 1 from our consciousness.

Explanatory comment: Regarding the third level of knowledge that Spinoza discusses in Part 5 of "Ethics", Spinoza, as a determinist, claims that there is a causative explanation for every object or event, even if it is hidden. He also claims that this third level of consciousness can disregard the nearest explanation, acknowledging and believing that at the end of the causal chain is an initial cause arising from the laws of nature, for example, the genetic code in the double helix. We will not expand on the third type of awareness in this paper due to the religious-mystical nature surrounding it (Ben-Shlomo, 2012). Tversky and Kahneman also avoid discussing this type of knowledge as it is not an objective criterion required for supporting or refuting scientific explanation. In regard to this Kahneman maintains that phenomena can be explained by statistics or probability and those that cannot be explained by cause and/or statistics he calls "unavoidable instances of luck". According to Kahneman, because of human intellectual limitations "We would all prefer a causal explanation – but that's the way it is" (Kahneman, 179,180). As we have said, the limitations of this paper do not allow us to expand on this discussion here.

Representativeness and Availability

These two concepts as causes of errors in Kahneman's System 1parallel Spinoza's imagination and memory in Type 1 knowledge as causes of opinion and imagination (Kahneman, 2012). Kahneman raises the idea that System 1 establishes connections even in the absence of any reasonable connection and does not follow up on the options that it rejects and/or ignores as this would require mental exertion (Tversky & Kahneman 1974). Modern research has shown, as Spinoza had theorized, the possibility that we can activate System 2, the logical, conscious, 'slow', 'lazy' system, in order to correct errors. We should continually train and improve this system in order to acquire better skills for reality assessment and decision making. In the *Ethics* part 3 proposition 1 states: "In every human mind, some of its ideas are adequate, others are fragmentary and confused" Spinoza continues, "Our mind in some instances active and in other instances passive. Insofar as it has adequate ideas, it is necessarily active; and as it has inadequate ideas, it is necessarily passive" (Spinoza, 2002a, p. 279). It seems that the level of ideas here is parallel to the hierarchy of the cognitive level; the lowest level being passive and influenced by various factors and the higher active level influential by way of its own strengths. This level controls the external information that is absorbed. Our actions are caused by impressions of external objects which are not an integral part of our consciousness and do not stem from our own strengths (e.g., external objects or events which influence the imagination and memory). Thus, if a person has confused ideas he is considered passive. Some ideas are error-free and those that are erroneous (Spinoza, 2002a). Spinoza claimed that the reasons for error emanate from lack of information or partial information as well as lack of control over the domination of imagination and memory, as well as casual experiences. From this it is clear to Spinoza that: "From individual objects presented to us through the senses in fragmentary [mutilate] and confused manner without any intellectual order; and therefore I call such perceptions "knowledge from casual experience" (Spinoza, 2002a, p. 266), and also: "From symbols. For example, from having heard or read certain words we call things to mind and we form certain ideas of them similar to those through which we imagine things"

(Spinoza, 2002a, p. 267). And additionally, on awareness of Type 1: "Knowledge of the first kind is the only cause of falsity; knowledge of second [and third kind] is necessarily true" (Spinoza, 2002a, p. 268). Spinoza's Principle of Sufficient Reason is a guiding principle. Spinoza had the intent of producing an intelligible philosophy, his PSR served a crucial role in determining whether intention was successfully satisfied (Schneider, 2014). From this point the way to Tversky & Kahneman's (1974) findings in the heuristics of 'representativeness' and 'availability' is short. Empirical researchers working on processes involving judgment and assessment in conditions of uncertainty established the existence of dominant factors used to judge reality affecting a person's cognition and behavior. Representativeness - the process of extraction from the imagination, and availability - retrieval from memory, are two internal processes that form a person's view of the world and direct his behavior. These are shortcomings, evident not only when observing laymen, but commonly seen even in experienced learned researchers who may sometimes act intuitively, without self-monitoring.

In part 2 proposition41 Spinoza (2002a) suggests the only cause for mistakes comes from type 1 knowledge, and the corrections made by type 2. In part 3, proposition 3, he emphasize practical advantage of type 2 As we have stated the parallels seen between Spinoza and modern day research in both levels of consciousness exposes the contemporary researcher of behavioral and decision making studies to the philosophical views found here.

Imagination and Representativeness

The discussion about the mechanisms of imagination in Spinoza's *Ethics* emanates from part 2, proposition 16 and 17, where he focuses on the role of imagination and explains at length the reasons for its correlation or lack thereof to reality. From the very outset of the discussion it is clear that he is referring to a cognitive process made up of a number of connected and explainable processes. Spinoza defines the false connection between an event and object to a specific category in his corollary to proposition 17 thus: "The mind is able to regard as present external bodies by which the human body [senses] has been once affected, even if they do not exist and are not present" (Spinoza, 2002a, p. 256). As far as Spinoza is concerned, although the objective reality in the world is a single entity, it can still be examined from two points of view: the physiological and the psychological aspects, which he sees as two sides of the same coin. Bar-Elli (2007) clarifies the double meaning of the term 'idea' in Spinoza's theory: the idea of the body as a mental aspect is the idea that expresses the body and all that happens within it as an object, whereas the idea of an external object is an idea that also belongs to the person looking at the object, but is an all-inclusive idea of the nature of the object – an objective representative idea of the object.

The presence of objects in the imagination, without cognitive monitoring that warns of their non-existence in reality, is known in today's research as 'representativeness'. Spinoza's theory also includes in the workings of the imagination re presence of perception or feeling, memory and imagination. The mind is mistaken only when it is unaware of the non-existence of things that it imagines to be existent (Spinoza, 2002a), that is, when active within Type 1. The ability to monitor, affirm or negate the adequacy of the images appearing in the imagination, in order to prevent errors, is the task of System 2. In "Short Treatise on God, Man and His Well-Being" Spinoza says that truth is the affirmation or negation regarding something and not in accordance with that something. In other words, an essential precondition for truth is that which is found in the mind must match that which exists in reality and not simply in accordance with a prototype of the real object in the imagination but in accordance with the relation between them and reality. In this regard, Tversky and Kahneman examine the family of biases rooted in the unmonitored dominance of the imagination.

Representativeness

Consciousness, the basic awareness allows the representation of objects or event, namely, imagination. We can imagine objects, which are not actually existent, within a given space For example, let us look at prototype characteristics; they are very accessible in similarity and thus are natural candidates for heuristic representativeness as an imaginary process. In other words, representativeness is a cognitive process based on the extent of the similarity between the object and the prototype of the category, and this is what establishes the simulated connection between them as a conclusion. The contact is so accessible as to blur the existence of other aspects that could actually indicate the lack of a link between A and X or B and Y. The excessive accessibility of the images of prototype characteristics, making them natural candidates for biases of representativeness was already demonstrated by Spinoza, describing the presence of objects that do not exist, as long as no other factor exists to expropriate the context of the image.

Reliance on heuristic representativeness stems from the fact that probabilities are estimated according to the degree in which X is represented in relation to A, i.e. by the extent of the similarity of X to A. For example, when X is very representative of A, the probability that X stems from A is thought to be higher than if X is not similar to A, in which case the probability that X stems from A seems lower. One of the errors emanating from the principle of representativeness is "insensitivity to prior probability of outcomes" (Tversky & Kahneman 1974, p.4). An experiment carried out by Kahneman & Frederick (2002) showed that insensitivity to prior probability of outcomes is one of the most common factors for bias and error. They emanate from the dominance displayed by the correlation between the object and the category, which diverts the awareness from data potentially contradictory to that correlation. For example: according to an image a correlation exists between a candidate for a job (the object) and the profession that he is most suitable for and none other, but according to statistics (a priori knowledge) there is a limited number of positions in that particular profession in relation to others. This fact has not been taken into consideration due to the dominance of the representativeness – the image of his suitability for the job that overshadows the reality thus constituting an obstacle in reaching an appropriate conclusion (Tversky & Kahneman 1974).

Tversky and Kahneman (1974) discuss a family of biases whose commonality stems from their dependence on the dominance of the imagination. The conclusions arising from the study of the family of biases of representativeness and availability apply to all fields concerning decision making, as Kahneman (2012) says that the psychology of judgment and the psychology of choice share the same basic principles; the only difference between them is the content. Heuristic prototypes solve similar problems in a variety of fields, where they produce similar types of results. In addition, the psychological principles that arose [from studies and experiments] are not unique to the particular field in which the judgments or decision making took place (Kahneman & Frederick, 2002). The first bias in the family of representativeness is 'insensitivity to sample size' (Tversky & Kahneman, 1974) resulting from mistaken inference emanating from the reliance on a conclusive result received from a small non-representative sample. An experiment carried out by Tversky & Kahneman (1972) showed that this bias stems from the presence of a 'fact' (result of a sample) in the imagination despite, and sometimes because of, the fact that it is given data and our consciousness disregards the fact that it is non-conclusive. The image is so impressive that the person in question tends to ignore the principle of the 'law of large numbers' that states that the larger the sample size the higher the probability of objective representation, so much so that the results of a large sample could turn out to be the opposite of the results of a reduced local sample that gave conclusive opinion of concurrence between the variables under examination.

Similar evidence can be seen in the 'misconceptions of chance' bias (Tversky & Kahneman, 1972), which is similar in essence to the previous one but emanates from an image that lacks a piece of information. A study carried out by Tversky & Kahneman (1971) with a group of experienced research psychologists, focused on the tendency to use statistical intuitions when making decisions. The study showed that people reckon that the frequency of random events will change at a particular rate. The two researchers bring as an example the well-known 'gambler's fallacy' whereby most people who observe a coin being tossed estimated the probability for 'heads' to increase with the increase in the previous number of 'tails' seen in succession; the gambler assumes each throw of the coin to be part of a self-correcting process They explain this bias on probability judgment that ignores the fact that the coin has no memory and that each throw is a separate and independent event (Tversky & Kahneman, 1974) This is a case of dominance in representativeness in System 1 as a process that places in the forefront of the consciousness a model of randomness that is supposed to balance itself out sooner or later.

Similarly, Spinoza views the reliance on randomness as a factor that causes error. The random occurrence is unconnected to causality (Spinoza, 2002a), and it is the nature of reason not to view things as random, but essential. It is purely dependence on our imagination that causes us to consider things as random, whether in respect to the past or the future (Spinoza, 2002a). In other words, knowing the reasons or being aware of the causal possibility in itself is reasonable and takes the place of the imagination - the task of Type 2.

In the 'illusion of validity' and 'regression to the mean' biases Tversky & Kahneman (1974) describe judgments emanating from the tendency to base predictions on the representativeness (Spinoza`s imagination) between given data available to the subject and the result required, without checking the validity of the data (Tversky & Kahneman, 1971).

Spinoza and Representativeness

Spinoza refers to this and the previous types of biases as matters of 'opinion or imagination' stating they are caused by what he calls: "Objects presented to us through the senses in fragmentary and confused manner without any intellectual order and therefore I call such perceptions Knowledge from casual experience or from symbols. […] we call things to mind and we form certain ideas of them similar to those through which we imagine things. Both these ways of regarding things I shall in future refer to as Knowledge of the first kind; opinion or imagination"(Spinoza, 2002a, pp.266-267).In conclusion it is fair to say that the family of heuristic representativeness relates to the subjective assessment of probability and to the subjective assessment of distance or size (see more below).

The cause of System 1 erroneous judgment stems from dependence on partial information or information having limited validity that is treated to heuristic principles. The erroneous judgment of sample size, misconceptions of regression, misconceptions of contingency and reliance on sequencing etc. stems from the same principle of the estimated images of distance and size (Kahneman, 2012). An interesting prior discussion of Tversky & Kahneman's (1974) family of biases of representativeness presented above is found in Spinoza *Ethics* part 2, proposition 35, where he states that error is based on lack of awareness included in inadequate, fragmentary or confused ideas, the root of the problem lying in the mind. The mind, acting as a 'factory' designing ideas, real or imagined, could design an idea that is defective inasmuch as it does not match the reality of the object or an idea that is defective by lacking consistency. In other words, the idea in question must match the reality and concurrently, as a product of the consciousness, must be whole, clear and coherent (Bar-Elli, 2007). Spinoza explains the gap between falsehood and idea as follows: man is conscious of his actions but ignorant of the causes by which they are conditioned. Basic knowledge of the causal factor of feelings or images and awareness of their existence is a precondition for preventing mistakes. This relates to Type 2 knowledge. To prevent error it is necessary to be aware of the essential essence of the object in question. This kind of perception, which is the responsibility of System 2, will focus on the essence of an object and define it distinctively within its general category. Spinoza's explanations regarding the root of errors and their correction relate to the concept of representativeness in contemporary research (Spinoza, 2002b; Ben-Shlomo, 1973).

Spinoza's ideas and their relation to the findings of the aforementioned researchers on the family of representativeness biases, could have been written today and not in the middle of

the 17th century. The family biases based on representativeness that listed above are alluded to by Spinoza in what he refers to as knowledge through incidental experience. Regarding knowledge of the first type, Spinoza refers to erroneous judgment emanating from randomness and one-off impressions of objects on the mind that create ideas. These impressions include, within them, references to the biases of "prototype" discussed above, and also to "illusion of validity" that presents the results of random trials (Tversky & Kahneman, 1974), 'insensitivity to sample size' and 'misconceptions of regression'. The conclusions arising from Tversky and Kahneman's empirical studies regarding human erroneous tendencies substantiate Spinoza's statements. In light of the fact that both concepts refer to a dominant process (not a fixed picture) that takes place within the consciousness as a category that is common to both imagination and representativeness and drawing on Spinoza's comparison between the imagination and the false representation that Tversky and Kahneman refer to in representativeness, and considering from the relationship of both these concepts to the components of 'procedure' and 'mind':

1. Each process of creating an image in the mind involves imagination.
2. Representativeness is the process of imagining in the mind. Therefore:

Therefor: 3. Representativeness = imagination

It is easy to see that the justification for this equivalence comes from the relationship of both these concepts to the components of "procedure" and "mind". The validity of this deduction comes from the similarity between Spinoza's statements in part 2 proposition17 and Tversky and Kahneman's conclusions regarding subjective heuristic assessments of representativeness as presented above. In other words, representativeness as heuristics acts as a tool for assigning an event or object to a certain category while relying on the imagination in system 1. With the appearance of the object or occurrence of the event, the imagination puts forward the prototype or the assessment of the category from the mental system, while the mind as is tends to ignore objective realistic data, "universal notions", in Spinoza's words (Spinoza, 2002b).

Spinoza and Availability

On examining Tversky & Kahneman's (1974) 'illusory correlation' and 'biases due to the effectiveness of a search set', similarity between the above and Spinoza's statements regarding the workings of memory can be discerned. In Definition 6 part 4, states that just as the proximity of the sun is assumed due to the intensity of its influence on our senses (light and heat), so also events in time affect our minds depending on their proximity or distance from the present: "An emotion whose cause we think to be with us in the present is stronger than it would be if we did not think the said cause to be with us" (Spinoza 2002a, p. 326). This proposition matches a similar suggestion by Tversky & Kahneman in 'biases due to the retrievability of instance'. Tversky & Kahneman (1974) say that, "The impact of seeing a house burning on the subjective probability of such accident is probably greater than the impact of reading about a fire in the local paper" (Tversky & Kahneman, 1974, p. 11). Spinoza continues in this vain in the following proposition: "We are affected toward a future thing which we imagine to be imminent more intensely if we were to imagine its time of existence to be farther away from the present. We also affected by remembrance of a thing we imagine to belong to the near past more intensely than if we were to imagine to belong to the distant past" (Spinoza, 2002a, p. 327). Kahneman (2012) attributes extreme predictions to System 1 and the readiness to predict rare occurrences based on weak evidence. It is the nature of an associative mechanism to make these extreme predictions fit and be overconfident when making judgments. We tend to intuitively create predictions that are too extreme and also have a tendency to believe in them too readily. Spinoza already described fallacies or complex ideas that arise from the mixture of erroneous or partial concepts relying on associative connections between them and images. He refers to uncontrolled trials to reach conclusions from habit and the tendency to seek short cuts. He attributes these biases to two habits: 1. the habit that stems from sensory perception, presented in a confused and fragmented fashion which he calls "knowledge from incidental experience", and 2. memories that have been fixed in our minds as ideas through things heard or read In the *Ethics*, scholium to part 2 proposition 44 Spinoza explains, the process whereby an idea becomes available in our memory so that if we are activated by two external objects simultaneously, later, when the mind imagines one of them, it is immediately reminded of the other (as if both were present at the same time). The erroneous connection between objects and events emanates from the fact that an object can make its mark on a person and become engraved in their memory in connection with a specific event. Hence when an image of one is seen, the other associativity recalled. Thus Spinoza explains the process which activates the concept known, in modern research, as 'availability' or 'active working memory'. In other words, thoughts about one thing transfer to another associatively, despite the fact that they are unconnected. A person will move from one thought to the next according to the manner his habitual thinking patterns arranged the items in his memory (Spinoza, 2002a). In part 3, proposition 18 Spinoza discusses the dominance of availability, i.e. the 'active memory' and its affinity to time being a deficiency. He says that an image of something in the past or future awakens in a person the same mechanism.

In *Ethics* part 3, proposition 36 Spinoza says that bringing to mind an image of something that once caused him pleasure, a person will desire that the said image will be in his possession in the same circumstances in which he had originally enjoyed it. This desire is stimulated by available memory – the impression of what Spinoza calls opinion or imagination or as a result of incidental encounters with something that causes retrieval from memory according to known characteristics. In his introduction to part 4 of *Ethics*, Spinoza explains in general the reasons for the influence of preconceived ideas on man's decisions. People tend to create models, prototypes of their ideas about matters, and whenever judgment is required they prefer the models matching those stored in their memory over others. Spinoza's description carries much weight in explaining the empirical evidence of 'illusory correlation' bias

as the ideas and fallacies that he talks about stem from opinions and/or random feelings that make an impression on the imagination and are subsequently stored in the memory.
Spinoza also states that the lack of adequate knowledge of the duration of things is a cause of error (Spinoza, 2002a,b). When it affects decision making, awareness of good and bad is abstract general knowledge as we determine the length or duration of things purely from the strength of the memory or the imagination where the appearance of the object or event in the present tends to be the determining factor due to its availability (for or further discussion on good and bad or pleasure and pain (Lucash, 2008).

Spinoza (2002a, b) states that an emotion is experience stronger when one imagines its cause to exist in the present time than if it is not imagined to be present. Spinoza connects the act of imagination with the element of time as an idea by which the mind sees something as being present as well. The impression of this availability is so strong, that as long as something else, powerful enough to remove that image is not imagined, it will continue to leave an impression that it exists and is actually present. This image becomes weaker and loses its influence when observing other things that are present (either in reality or in our imagination) until it fades away. Spinoza then concludes that something that exists in the present has a greater impression on us then active or things we attribute to the past or expect in the future. In addition, due to the fundamental contiguity between memory and availability, the availability of the event for retrieval from memory is dependent on its proximity or distance in time. Spinoza determines that an event or object that we expect in the near future affects us more than something we expect in the distant future. The same principle applies to the past, whereby short-term memory is more dominant than if we imagine that the event or object had long since gone (Spinoza, 2002a). This is another statement of Spinoza's which is supported by modern research, as shown in the discussion of Tversky & Kahneman's (1974) 'Misconception of chance', 'biases due to the retrievability of instances', and their empirical conclusion about the tendency to go with the 'ease' and 'efficiency' of availability. Using time as a common denominator for 'memory' and 'availability' as processes rather than fixed images, we can define their identity thus:

1. Memory as a conscious image is a process of remembering events (or objects) on the time line (duration).
2. Availability is the process of remembering events (or objects) on the time line (duration) as a conscious image.

Therefore: 3. Availability = appearance in memory.

This equivalence can be justified on the basis of both concepts being connected with time, and of its being part of a 'process' rather than a one-time display. The conclusion is reaffirmed when we compare Spinoza's explanations in Latter 12 about the relationship of memory and time (Spinoza,2002c) and also in (Spinoza 2002,a) part 2, proposition 18 and 44, in part 3 proposition 36 and in part 4, proposition 9 and 10, with Tversky & Kahneman's theory conclusions of availability sub categories. There is further support for my conclusion in part 4, proposition 9-13 and scholium to proposition 60, where Spinoza, again, discusses the affinity between time and the extent of influence of the coincidental, the possible and the inevitable on the mind.

Coincidental, Possible and Inevitable and Illusions of Time

The parallel to Spinoza's discussion on the levels of judgment of incidental, possible and inevitably is best seen in Tversky and Kahneman's research (1974) in their experiments of tossing a coin that were mentioned above in the "gambler's fallacy". This experiment shows the illusion of changing from the impression of chance to the possible, even to the point of imagining a causal-essential image. A gambler who observes the continual appearance of one side of the coin assumes that there is a probability or statistical relationship between each toss of the coin and that the sequence of one side appearing is coincidental. Now according to his assumption the appearance of the second side changes in his mind from being coincidental to being possible. The root of the problem, as explained by Tversky and Kahneman, stems from the false idea that there is a statistical connection between the throws. When the above researchers talk about the family of representativeness and availability as a source of biases, for example, "misconception of chance", "illusion of validity" and "illusory correlation" as behavior modifiers according to System1, they mean the same as Spinoza when he explains imagination and memory as being factors causing errors in what he terms "Knowledge of the first type – opinion or imagination", that see events as coincidental or possible and not maintaining that there is a reason for everything. Maybe the coin is misshapen; maybe the person tossing the coin always throws it in a particular direction. In Spinoza's words: "Emotion toward a thing which we know not to exist in the present, and which we imagine to be possible, is, other things being equal, more intense than emotion toward a contingent thing" (Spiniza,2002a, p.328).

The associations that these two biases create reflect a search for connections in images or memory or a connection that is logical or causal between objects or ideas that are unconnected. According to Kahneman, associative memory adds to general confirmation bias, and is characteristic of System 1. System 1 prefers to use clues and exaggerations with regard to extreme unexpected occurrences, due to the fact that such occurrences, a tragedy, for example, or any other trauma, make the impression that they are likely to occur (Kahneman, 2012). In addition, what is known as the "halo effect", as a first impression that feeds System 1 whose correction by System 2, is described by Kahneman from his personal experience of critical reflection that he carried out by means of System2. In part 2, proposition 43 Spinoza describes the thought process and reflection of System 2 thus: "He who has a true idea knows at the same time that he has a true idea, and cannot doubt its truth" (Spinoza, 2002a, p.268). And continuing in proof A and Scholium: "This adequate idea of the idea A will be in the mind which has the adequate idea. So he who has an adequate idea, that is, he who knows a thing truly, must at the same time have an adequate idea, that is, a true knowledge of his knowledge; that is (as is self-evident), he is bound at the same time to be certain (Spinoza, 2002a, p. 269). This issue depends entirely on System 2 and/or on critical reflexes, as expressed by Spinoza. Spinoza`s "Principle of Clear and

Distinct Representation" explains a principle of representation as a power or causality that belongs only to real things (Schneider, 2014).

When we imagine a move from coincidental to possible our belief in predictions increases. According to Spinoza the correction for this bias is found in "adequate ideas" i.e. the awareness of the fact that there are no causes that will initiate our expectations as there is no connection between throws: each throw is an isolated event, and the coin does not remember the previous throw. The adequate idea is that reality reflects the result of a cause or causes – a causal explanation, for example, the hand of the person tossing the coin, the weather, the surface, or a defect in the coin. All these may be reasons why the coin always lands on the same side and not unconnected statistics that reflect a confused image or lack of knowledge. Spinoza discusses the effect of the element of time (past, present and future) on imagination and memory in part 4, proposition 9 as follows: "An emotion whose cause we think to be with us in the present is stronger than it would be if we did not think the said cause to be with us" (Spinoza, 2002a, p.326). In his corollary to this proposition Spinoza explains an image from the past or one regarding the future while ignoring the present is weaker that an image from the present time, i.e. under equal conditions (excluding powerful or traumatic impressions) the present will always have a stronger effect on the mind.

The same can be said regarding the level of influence of something that is imminent as opposed to the lesser influence of something that is due to occur in the distant future. In Spinoza's words, "We are also affected by remembrance of a thing we imagine belong to the near past more intensely then if we belong to the distant past" (Spinoza, 2002a, p. 327). In part 4 proposition 11.Spinoza distinguishes between the three ways of perceiving reality (coincidental, possible and inevitable) and connects them with the workings of the mind: "An emotion toward a thing which we think of as inevitable is more intense, other things being equal, then emotion toward a thing possible, or contingent, that is, not inevitable"(Spinoza, 2002a, p.327). If we perceive a thing to be essential we affirm its existence. An essential event or item is one whose existence is supported by reason. Thus, according to Spinoza, the knowledge we perceive from a causal relationship is stronger than the perception of something coincidental or possible. Following on from this principle, the possible has a stronger presence on our minds than the coincidental, and Spinoza says: "Emotion toward a thing which we know not to exist in the present and which we think of as contingent is much feebler than if we were to think of the thing as with us in the present" (Spinoza, 2002a, p.328). Spinoza continues to describe what we call "representativeness" as workings of the imagination that, in knowledge of the first kind, is affected by illusions of time. In part 4, proposition, l3: "Emotion toward a contingent thing which we know not to exist in the present is, other things being equal, feebler than emotion toward a thing past" (Spinoza, 2002a, p.328).

In relation to the past it is easy to determine that he refers to "availability" as workings of the imagination in knowledge of the first kind that is influenced by the presence of an event on the time line of the past.

We can see, therefore, that Spinoza's claims are substantiated by today's empirical studies that state that the erroneous impressions of representativeness and availability weaken when we understand the reasons through System 2 that can in neutralize the time-based illusions and in transferring the coincidental to possible and the possible to the inevitable as the real representative of the causality. For example: tossing a coin or gamblers' errors in predicting colors on a roulette wheel. We tend to imagine statistical reasoning that will correct itself, being an attempt to give a statistical explanation (possible) to something that appears coincidental. We do not take into account the fact that each toss of the coin is an isolated occurrence and does not remember the previous toss and that a causal explanation is not an image. When we have no causal explanation for the reason that the coin continually lands on the same side, we tend to give a statistical explanation, because, as Spinoza also claims, a possible option (i.e. the statistical one) is stronger, giving a more powerful impression as to its credibility, than an option we perceive to be coincidental. It is a failure in representativeness as seen in Tversky and Kahneman (1974) in "Misconception of chance" and Insensitivity to predictability "and "Biases due to the retrievability of instances", discussed here, which support Spinoza's claims regarding the relative strength of coincidental, possible and essential impressions on the human mind as being a basis for explaining behavior.

Conclusion: Knowledge of the Second Kind = System 2

According to Spinoza (2002a), the distinction between the two systems and the corrections done by use of system Type 2 to the biases and errors caused by using System 1, making us active rather than passive, on his definitions 1 and 2 in part 3: I say that we are active when something takes place, in us or externally to us, of which we are the adequate cause; that is, when from our nature there follows in us or externally to us something which can be clearly and distinctly understood through our nature alone [that is the 2nd kind of cognition] (p. 311). Tversky and Kahneman (1974), when discussing availability, claim that man tends to assess frequency of a group or probability of an occurrence according to the ease or speed that similar examples or events come to mind, and to an even greater degree so in situations of uncertainty (Kahneman, 2012). However Spinoza had already explain that impressions of things are stored in our memory according to the order in which they appeared (availability), and not according to their real reasons, which may lead to false assumptions that do not match reality. His ideas match the findings of empirical research dealing with all biases due to the System 1, which was formed by evolution so that an organism may survive in situations where its existence is threatened and take advantage of the situation to improve its status in a hostile environment. Man as an organism also strives to exist and survive. In 'Basic Assessment' Kahneman (2012) describes how in fulfilling this existential cause one is continually assessing situations as 'good' or 'bad'. Should one approach or hold back, attack or flee? The ability to distinguish between friend and foe is similar to distinguishing between pleasantness and

unpleasantness, generosity or stinginess, sympathy or antipathy that Spinoza talks about in his definition of 'will' (Spinoza, 2002a). Sometimes we make such decisions depending on the facial expressions of the person in front of us, obviously not a perfect way of assessing their intentions. According to Kahneman (2012) when it comes to survival, System 1 is at advantage.

According to Spinoza (2002a), System 1 tends to substitute complex issues with simpler ones, in other words, instead of dealing with a complex problem that it cannot solve properly within a reasonable time limit it makes a kind of mental withdrawal to a simpler problem. This system provides off-the-shelf answers even for the difficult or complex problems. This system is unequipped to cast doubt on its own opinions or conclusions as it rejects ambiguous questions. On the other hand, System 2 is capable of casting doubts as it can simultaneously explore contradictory possibilities. Modern research demonstrates this by way of the 'law of small numbers' and 'insensitivity to sample size'. This system pays much more attention to the content of the message received than to information regarding its credibility and therefore provides causal explanations for coincidental occurrences (Tversky & Kahneman, 1974). System 1 provides an illusion, a false sense of security, which relies on the effects of representativeness and availability while ignoring objective facts that require attention and cognitive effort - which are not in its mechanism. It is the role of System 2 to correct these intuitive predictions; the considerable effort required is especially justified when the results are crucial for the person involved (Kahneman, 2011). Kahneman attributes the need for attention and effort to System 2; therefore in many cases he characterizes it as 'lazy' and uninterested in making an effort above and beyond what is absolutely necessary for basic-term survival.

Kahneman (2011), like Spinoza, sees the remedy for this laziness in practice and training, and advocates a way of life filled with self-awareness of everyday activities that would eventually become a cognitive habit which may often prevent the biases and perceptual distortions of reality discussed earlier, particularly in critical, existential cases. This is how Spinoza recommends training the use of System 2: "Therefore it is of the first importance in life to perfect the intellect, or reason, as far as we can, and the highest happiness or blessedness for mankind consists in this alone" (Spinoza, 2002a, p. 358). Spinoza's wise words are echoed in modern empirical behavioral studies witch can be summed up in Kahneman's recommendation that, the way to block errors originate in system 1 is simple in principle: recognize the signs that you are in a cognitive minefield, show down, and ask for reinforcement from system 2 (Spinoza, 2002a). In his letter to Yohan Baumeister dated 10th June 1666, Spinoza explains how to activate the lazy System 2: "It is quite clear what a true method must be and in which it should especially consist, namely, solely in the knowledge of pure intellect and its nature and laws. To acquire this, we must first of all distinguish between intellect and imagination, that is, between true ideas and others – fictitious, false, doubtful, and, in sum, all ideas which depend only on memory. To understand these things, at least as far as the method requires, there is no need to get to know the nature of mind through its first cause; it is enough to formulate a brief account of the mind or its perceptions" (Spinoza, 2002c, p. 861). Spinoza's challenge in improving System 2 is designed to make it easier to use and for it to become part of life's routine. We will conclude here that the connection between a good decision, good values and happiness representing the joint aim of philosophy from times immemorial and contemporary behavioral science.

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