

Spinoza, Maimonides, and Neuroscience: Anger, Habit, and the Embodied Conditions of Freedom

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Effective emotion regulation is a central problem for both moral psychology and contemporary psychology because entrenched affects often persist despite explicit knowledge of their causes. This article compares Spinoza's and Maimonides' accounts of affective transformation, with particular emphasis on anger, habituation, and the conditions of agency. Its principal claim is not that contemporary neuroscience empirically validates a medieval doctrine of free will, but that Maimonides' emphasis on repeated action and the formation of stable dispositions displays a functional and conceptual convergence with contemporary research on neuroplasticity and habit formation. Spinoza's account is treated in its stronger form: affects are not overcome by true propositions merely as propositions, but by adequate understanding insofar as it becomes affectively efficacious and participates in a stronger counter-affect. The comparison therefore distinguishes historical anticipation, conceptual convergence, functional analogy, empirical compatibility, and empirical confirmation. Neuroscientific evidence concerning distributed emotion processing, cognitive reappraisal, and corticostriatal learning is used only at the levels of functional analogy and empirical compatibility. The analysis suggests that repeated practice can reorganize emotional dispositions without thereby establishing metaphysical freedom, and that the most productive contribution of the comparison to psychology lies in integrating cognition, behavior, emotion, and neural plasticity in accounts of durable self-regulation.

Keywords: Maimonides, Spinoza, affects, free will, anger, therapy of the mind, habituation, repentance, neuroscience, brain reorganization

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Introduction

The question of free will, traditionally viewed as the foundation of moral responsibility, finds in the treatment of affects—and particularly anger—a critical testing ground where two divergent therapeutic models clash. On the one hand, Spinozist therapy of the mind, which rejects the idea of free will, faces a structural difficulty: knowledge of the causes, which is intended to be intellectually liberating, remains in fact incapable of defusing affects such as anger. For Spinoza, the transition from

**Centre National de la Recherche Scientifique (France).* I want to thank the anonymous reviewers for their helpful comments on an earlier version of this paper.

passion to action requires a cognitive restructuring whose clinical effectiveness remains contingent on

the power of the adequate idea, thus leaving the subject defenseless in the face of the inertia of affective neural networks. Conversely, Maimonides proposes a therapeutic approach based on an ethic of practicing the “golden mean” i.e., the appropriate balance between two extreme behaviors. From this perspective, anger should not merely be understood but should initially be regulated through the repeated performance of contrary actions. This article aims to analyze the respective approaches of Spinoza and Maimonides—first regarding free will, then concerning affects, particularly anger—and subsequently to evaluate these two approaches in light of contemporary neurobiological findings. I reverse the chronological order of these two authors because Maimonides appears to have anticipated—and at least partially resolved—some of the difficulties posed by Spinoza’s account of the therapy of affects, and that is why I will first analyze the main lines of Spinozist therapy.

I will outline the epistemological conditions that allow scientific and experimental data to be incorporated into ethical debates, thereby demonstrating that, from a neuroscientific perspective, the limitations of Spinozist therapy stem from an excessive reliance on higher cortical processes, whereas Maimonides’ model appears to align with the discovery of the mechanisms of synaptic plasticity. By emphasizing behavioral repetition, Maimonidean therapy can be retrospectively related to neural mechanisms of habit formation involving the basal ganglia, particularly the striatum, through which initially deliberate actions may gradually become habitual dispositions. This study demonstrates that Maimonides’ pragmatic approach finds validation in discoveries concerning the transfer of neural activity to the centers of habit, thereby achieving true neurotherapy of the soul. However, neuroscience also reveals points of convergence with concepts specific to

Spinozism. Thus, according to Antonio Damasio, Spinoza had anticipated the concept of somatic markers, which express bodily states that guide decision-making and emotional regulation. For the author of the *Ethics*, emotions constitute essential components of what we might call homeostatic regulation, which is the set of processes by which an organism maintains its internal balance. This perspective also seems to validate the Spinozist parallelism of mind and body, with mental states precisely expressing the ideas of bodily affections.

I will attempt to clarify the issues at stake in these questions at the intersection of science and philosophical reflection, by demonstrating the contribution of neuroscience to the retrospective assessment of the convergences and divergences with the therapeutic theories of Maimonides and Spinoza. For purposes of this study, several terms require clarification. 'Affect' designates, in Spinoza, a modification of bodily power together with its idea; in the Maimonidean context, 'emotion' and 'character trait' refer more broadly to passions and dispositions that can be morally educated. 'Habituation' denotes the stabilization of conduct through repeated practice, whereas 'neuroplasticity' denotes experience-dependent change in neural organization. 'Therapy' is used here in a historically qualified sense: Spinoza's philosophical therapy and Maimonides' moral-religious discipline are not modern psychotherapy or clinical treatment, although they may be compared with later psychological models at the level of function. Likewise, 'freedom' refers first to the authors' philosophical conceptions of agency and must not be inferred directly from neuroscientific evidence.

The objective is to determine which elements of the two philosophical models are conceptually comparable with contemporary accounts of emotion regulation and habit formation, while preventing anachronistic or reductionist inference from neuroscience to metaphysics. The study is relevant to historians of philosophy and religion, but also to psychologists concerned with emotion regulation, behavioral change, habit, and the relation between deliberate control and automatic processes. Its psychological contribution is organized around three propositions: emotion regulation is not reducible to conscious cognition; repeated behavioral practice can modify emotional dispositions; and durable psychological change emerges from interactions among cognition, behavior, emotion, and neural plasticity. The article first reconstructs Spinoza's model in its strongest form, then examines Maimonides' account of anger, habituation, and repentance, and finally compares both frameworks with contemporary neuroscience before drawing practical, methodological, and research implications.

The primary texts of Spinoza and Maimonides are reconstructed according to their own conceptual vocabularies before any comparison

with contemporary psychology or neuroscience is attempted. The analysis is therefore asymmetrical only where the historical sources themselves are asymmetrical; it does not assume in advance that one thinker is clinically superior to the other. Claims are evaluated at four distinct levels: textual reconstruction, conceptual comparison, functional analogy, and empirical compatibility. Empirical confirmation is reserved for claims that could in principle be tested within contemporary science and is not extended to metaphysical doctrines such as libertarian free will or Spinozist necessity.

Neuroscientific literature is used as a secondary comparative corpus rather than as a tribunal for assessing seventeenth- or twelfth-century metaphysics. Findings concerning distributed emotion processing, prefrontal-subcortical interaction, prediction, plasticity, and corticostriatal habit learning are used to ask whether a historical model offers a functional description compatible with known mechanisms of behavioral change. This design deliberately distinguishes historical anticipation from retrospective resemblance: a medieval text cannot 'predict' a neural mechanism in the modern scientific sense merely because later findings illuminate one of its practical intuitions. The method also treats 'therapy' as an analogical category encompassing philosophical and moral techniques of self-transformation without identifying them with evidence-based psychotherapy.

The Concept of Free Will and the Difficulties of Spinozist Therapy of the Affects

In the *Treatise on the Improvement of the Intellect*, Spinoza reports that he found himself in "supreme peril (*summo versari periculo*)," and that he then endeavored to devise a remedy (*remedium*), which he found in the philosophical enterprise itself (Spinoza, 1925). He was thus seeking "a way to heal the intellect (*modus medendi intellectus*)," in order to "purge it (*expurgandi*)" and thereby be able to understand things without error (Vaysse, 1999). Note that Spinoza uses terminology here that refers to Aristotelian cathartic therapy, which, however, aimed to purge not the intellect, but the emotional energy of the soul (Aristotle & Sachs, 2006). While Descartes attributed to the body alone "everything that can be observed in us that repels our reason," (Descartes, 2012) for Spinoza, passion arises solely from an inadequate idea.¹ The consequences of an affect follow from its nature with the same necessity as the equality of a triangle's angles to two right angles follows from the nature of the triangle.² This is why a passive affect can be transformed into an action when we

¹ Spinoza, *Ethics* III, 3.

² Spinoza, *Ethics* IV, 47, scholium

understand its causes of its production, for there is no “affection of the body (*nulla est corporis affectio*) of which we cannot form some clear and distinct concept.”³ It is in this sense that Spinozism has been described as spiritual psychotherapy (Grossman, 2014). He observes that “an affect is therefore all the more within our power, and the mind suffers all the less from it, the more familiar it is to us” (*Affectus igitur eo magis in nostra potestate est et mens ab eo minus patitur quo nobis est notior*).⁴ However, he does not explain what makes this intellectual mastery of the affects possible. *Ethics* V, 6 specified that the mind’s power over affects (*in affectus potentiam*) depends on its understanding based on the principle: “all things as necessary (*res omnes, ut necessarias*).”⁵

Spinoza argues that we can gain greater control over our passions by understanding their causes. Yet his rejection of free will, which he links to the teleological illusion, (Parens, 2012) raises a difficulty. If transforming an affect requires us first to *decide* to understand it, how can this decision initiate the process when, for Spinoza, it is itself necessarily determined by prior natural causes?

Spinoza seems aware of the necessity of such an initiative when he shows that an individual who imagines “someone affected by hatred will, by that very fact, be affected by hatred (*eo ipso etiam odio afficietur*).”⁶ And he adds that hatred “can be erased by love in return (*amore contra deleri potest*),”⁷ but he does not specify what makes such a reversal possible. As Augusto Guzzo has pointed out, we are faced here with a contradiction between the purely reactive and quasi-mechanical generation of hatred, and the notion of *potest*, which surreptitiously introduces the power of love, capable of erasing this hatred. Guzzo emphasizes that the erasure of hatred presupposes the intervention of free will, which is precisely what the term *spotest* connotes. Indeed, in order to free oneself from a negative attitude or behavior, one must first be free to do so. (Guzzo, 1924) Spinoza specifies that what makes such a change possible is the act of imagining that another person is “affected by love (*amore erga se affectum*) toward him ... insofar as he imagines this (*quatenus hoc imaginatur*).” It is by introducing the term *quatenus* that Spinoza explains here that an individual who imagines not hating another can thereby cause the hatred present in the soul to be erased (*et odium ex anima delebit*).⁸ The term *quatenus* allows Spinoza to link, without any prior deduction, two fundamentally heterogeneous orders: on the one hand, the causal

³ Spinoza, *Ethics* V, 4,

⁴ Spinoza, *Ethics* V, 3, corollary

⁵ Spinoza, *Ethics* V, 6,

⁶ Spinoza, *Ethics* III, 40, demonstration, Pautrat, pp. 278–279

⁷ Spinoza, *Ethics* III, 43, Pautrat, pp. 284–285

⁸ Spinoza, *Ethics* III, 43, demonstration

determinism that gives rise to hatred, and on the other hand, the will (a term Spinoza does not use here, but whose notion, according to Guzzo, is presupposed for the coherence of the argument). The adverb *quatenus* would thus allow Spinoza to assert the transformation of hatred into love, in order to be able to feel the joy resulting from such a transformation. However, from a semantic standpoint, determinism is causal and therefore of an extensional order, (Davidson, 1967) whereas the will—which is surreptitiously implicated in the change from hatred to love—remains individual and is of an intensional order. As Hans Jonas noted, Spinoza moves between two ways of understanding the relation between mind and body: “the idea of this body” (*genitivus objectivus*) treats the body as the object represented by the idea, whereas “this body’s thought” (*genitivus subjectivus*) presents thought as the mental expression of the body itself. Thus, the first emphasizes what thought refers to (extensional relation), while the second emphasizes the content or mode in which the body is mentally expressed (intensional relation). (Jonas, 1965) This is why Jonathan F. Bennett emphasizes that claiming to transform a passion into action through the power of the idea is a form of conceptual leap that Spinoza fails to justify deductively. (Bennett, 1984) Throughout the stages of this transformative process, the term *quatenus* thus serves as a substitute for voluntary decision, which alone would otherwise be capable of initiating the transformation of a negative affect into a positive one.

In this process, the *Ethics* prescribes separating the pathological affect from the thought of its external cause and then associating it with other thoughts, so that this affect may be destroyed (*destruentur*).⁹ However, disconnecting the affect from the idea of the external cause from which it originates cannot, by itself, form a more powerful positive affect. On the contrary, it risks leading to a complete and utter nullification of the individual’s affective energy. In the absence of any guarantee regarding the desired reconnection, there is always the risk of inducing what has been described as a state of *acedia*, a state of spiritual and psychological apathy, which falls under the category of sadness (Taylor, 1972). It should be noted that, from a psychopathological perspective, *acedia* places the individual in a state of *acrasia*, weakness of will, which can lead to obsessive neurosis. According to a metaphor used by Teresa Brennan to explain *acedia*, one could say that Spinoza overdetermined the *pes intellectus* (the foot of the intellect), relegating the *pes affectus* (the foot of affect)—which alone constitutes the *pes operis* (the foot of action)—to a secondary role. Such overdetermination may therefore lead to psychopathological imbalance (Brennan, 2004).

⁹ Spinoza, *Ethics* V, 2

Affects, such as fear, for example, are in no way alleviated by knowing the cause that makes a dreaded event inevitable. However, it is true that Spinoza, in the Scholium to *Ethics* V, 6, gives the example of sadness caused by the loss of a good. This sadness can be alleviated as soon as one considers that there was “no possibility of preserving that good (*considerat bonum illud servari nulla ratione potuisse*).”¹⁰ However, this example concerns a concrete, past, and irreversible event, it is a particular affect that differs from the affects arising from current bodily sensations, the cause of which continues to persist. Consequently, knowledge of the cause of sadness—arising from the loss of a good—may be effective in the specific case of a past event, but this knowledge is no longer relevant when dealing with affects whose actual causes remain ever-present. (Bennett, 1984).

In fact, according to Spinoza, true ideas cannot alter the affects merely by virtue of their truth, but only if true knowledge is itself considered an affect (*ut affectus consideratur*).¹¹ There is a correlation between what increases or decreases the power of action of our body (*corporis nostri agendi potentiam*) and what increases or decreases the power of thought of our mind (*nostrae cogitandi potentiam*) (Wartofsky, 1979). While knowledge in itself is not sufficient to suppress (*coercere*) the affects, it can nevertheless contribute to their reduction, provided that it presents an affect that is “opposite and stronger” (*contrarium et fortiolem*).” than the affect to be suppressed. An affect is “an idea through which the mind affirms a greater or lesser power of existence for its body than before (*affectus est idea qua mens maiorem vel minorem sui corporis existendi vim quam antea affirmat*).” When the mind itself is affected, the body is likewise affected, and consequently, its power to act is increased or diminished (*qua ejus agendi potentia augetur vel minuitur*).¹²

It should be noted that Spinoza, who uses the concept of power to act (*agendi potential*) 63 times in the *Ethics*, never actually defined it. Nor did he define the concept of power (*potentia*) in general (Charles, 1999). Generally speaking, even though reason should be able to combat the affects, it remains in fact powerless because they are always caused accidentally (*per accidens*).¹³ Indeed, reason knows only the universal and the necessary (the common properties of things), whereas the affects are tied to singular and unpredictable associations. This is why a line of reasoning, even if true, cannot dispel an affect whose cause is purely accidental.

¹⁰ Spinoza, *Ethics* V, 6

¹¹ Spinoza, *Ethics* IV, 14

¹² Spinoza, *Ethics* IV, 7 and demonstration; *Ethics* IV, 14, demonstration

¹³ Spinoza, *Ethics* III, 50

As I have noted, mastery of the affects presupposes opposing and stronger affects. If the effect is an idea through which the mind affirms the “power of its body to exist (*corporis existendi vim*),”¹⁴ such a power is, however, determined by the competitive interplay of the *conatus* (basic drive toward self-preservation and an increase in the power to act), and it always depends on the vagaries of the environment. Since these vagaries remain external to the individual, he cannot, in a purely rational manner, control the infinite number of causes that determine them and, consequently, the effects themselves.

Although Spinoza defines affects as both bodily modifications and corresponding ideas, his therapeutic account tends to privilege their cognitive dimension. In doing so, it arguably underestimates their specific emotional content and corporeal dynamism, both of which must be taken into account if the affects are to be effectively mastered. (Segal, 2000). In addition, Spinoza encountered a semantic difficulty, since the common properties intended to adequately understand the affects are universal and extensional in nature, whereas the emotional character of each affect always remains singular and intensional. Such semantical heterogeneity thus makes the therapeutic transformation from passive affect to active affect problematic; a transformation that must combine the cognitive dimension of the affect—which falls under the attribute of thought—with its bodily aspect—derived from the attribute of extension—contrary to the psychophysical distinction established in *Ethics* III, 2. This is why Spinoza ultimately recognized that, in the absence of perfect knowledge of our affects, “the best we can do (*optimum igitur, quod efficere possumus*) is to conceive a sound rule for living, in other words, well-defined and certain principles of conduct (*rectam vivendi rationem seu certa vitae dogmata concipere*).”¹⁵ These principles, imprinted in our memory and used continuously, should thus permeate the imagination in such a way as to facilitate their application. However, Spinoza does not specify in any way what these practical rules are that are capable of actually changing our habits. He also fails to mention that the establishment of such rules always presupposes a voluntary decision to apply them. In this sense, the very possibility of establishing such rules contradicts the fact that, for the author of *the Ethics*—and unlike the author of the *Metaphysical Meditations*—human beings are never masters of their own thoughts, since these are always determined by necessity; thus, no will to control them can intervene to bring them under control. (Descartes, 2012).

¹⁴ Spinoza, *Ethics* IV, 14, demonstration

¹⁵ Spinoza, *Ethics* V, 10, scholium. However, this affective force is of corporeal origin and therefore proceeds from the attribute of extension, whereas reason derives from the attribute of thought.

Spinozist Therapy in Light of Neuroscience

Several positivist philosophers, such as Friedrich Albert Lange, (Lange, 1866) and Ernst Haeckel, (Haeckel, 1892) noted the Spinozist unity between the mind and natural mechanisms, and they viewed Spinoza as a precursor of scientific monism. They thus suggested that Spinozist philosophy could provide a conceptual framework for thinking about the mind-body unity, as well as the natural determination of mental phenomena. In this sense, it has been pointed out that Spinozism anticipates a biophysical theory of the organism. (Atlan & Boncardo, 2024). I shall recall that Heidi M. Ravven has interpreted Spinoza as a proto-neurobiological thinker. She argues that his conception of human agency anticipates an embodied account of cognition and behavior. On this reading, affects arise from the integrated activity of mind, body, and environment rather than from an autonomous will. (Ravven, 2013; Ravven, 2003). Antonio Damasio likewise proposes a neurobiological interpretation of Spinoza, in *Looking for Spinoza*, he emphasizes the relevance of Spinoza's theory of the affects to contemporary accounts of emotions and their neural representations. Damasio sees the *Ethics* as anticipating the view that emotions and feelings are embodied processes essential to reason and decision-making. His interpretation thus illuminates the naturalism of Spinoza's analysis of affective life.

He tends then to translate Spinoza's metaphysical framework into the causal vocabulary of contemporary neuroscience.¹⁶ However, for Spinoza, the body cannot causally determine the mind, nor can the mind causally determine the body, since each attribute follows its own order. On the contrary, Damasio shows that the mind originates in the body and that there is a dynamic continuity between the neural level and the mental realm (Damasio, 2003). In this sense, neurobiology appears to challenge Spinoza's theory of the effects on several points. As I have just noted, neuroscience has established that there is a causal relationship between the mental realm and the somatic neural level, which contradicts the parallelism posited in *the Ethics*. Indeed, neuroimaging studies show that top-down processes, in which higher cognitive functions regulate emotional responses, can modulate emotional intensity, whereas bottom-up processes, in which affective responses arise from more basic neural mechanisms, engage persistent and distinct amygdala circuits (Ochsner et al., 2009). Spinoza's rejection of free will notwithstanding, contemporary neuroscience shows that emotions can be intentionally regulated through cognitive reappraisal, although this finding does not in itself establish the existence of metaphysical free will. Cognitive reappraisal dynamically modulates communication between prefrontal cognitive-control

¹⁶ Spinoza, *Ethics*, III, 2

networks and subcortical affective regions. It recruits the dorsolateral prefrontal cortex (dlPFC), together with other prefrontal and cingulate regions, and alters both amygdala activity and prefrontal–amygdala functional connectivity. The amygdala rapidly evaluates the affective significance of sensory information through interacting cortical and subcortical pathways. The conscious effort to reinterpret, for example, a source of anger mobilizes prefrontal circuits that modulate the amygdala (Berboth & Morawetz, 2021). This is a mechanism of emotional regulation highlighted by neuroscience, which can be described as a form of top-down causality, where a higher cognitive level acts upon the underlying neural activity.¹⁷ This functional description differs from Spinoza's prohibition of cross-attribute causation. Although the empirical result cannot by itself decide the metaphysical question, I should note that these empirical findings can only serve as a plausibility argument in favor of a non-parallelist interpretation of emotional cognition. This is supported by research on amygdala–prefrontal connectivity during emotion regulation and experimental evidence for the causal involvement of the dlPFC in reappraisal. Let's recall that Luiz Pessoa and Ralph Adolphs propose a “many-roads” model in which emotional information is processed through multiple interacting cortical and subcortical pathways. In this model, the amygdala does not operate independently of the cortex but participates in coordinating distributed neural networks that evaluate the biological significance of stimuli (Pessoa & Adolphs, 2010).

Some modular approaches in cognitive neuroscience conceive of the brain as composed of functionally specialized systems adapted to process particular kinds of information. This approach appears to diverge from Spinoza on three fundamental points:

1. There is no single neural source of emotion but rather a plurality of partly specialized and interacting systems. Fear and disgust, for example, recruit partly distinct but overlapping distributed networks. Subjective fear involves several cortical and subcortical regions, including the amygdala, insular cortex, prefrontal cortex, thalamus, and periaqueductal gray; it cannot therefore be reduced to an “amygdala circuit.” Similarly, although the anterior insular cortex is strongly associated with disgust, it is not its exclusive neural substrate (LeDoux, 1996). By contrast, for Spinoza, fear and aversion are particular forms of sadness that express a diminution in the power of acting (*Ethics* III, Proposition 11, Scholium; Definitions of the Affects 3, 9, and 13). The mind is not divided into distinct faculties, since such faculties are merely fictitious (*fictitias*) abstractions (*Ethics* II, Proposition 48, Scholium).
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2. According to modular models, specialized systems can process information in parallel, and their outputs may conflict; relatively automatic affective processes may therefore oppose reflective cognitive processes (Carruthers, 2006). According to Spinoza, however, an affect can be restrained or suppressed only by a contrary and stronger affect (*Ethics* IV, Proposition 7). Affective conflict is not simply a conflict between reason and the passions but constitutes a vacillation of mind (*fluctuatio animi*) arising when the mind is affected simultaneously by contrary affects (*Ethics* III, Proposition 17, Scholium).
3. According to some modular models, certain rapid emotional processes are relatively autonomous from central cognitive processes. Thus, an individual may experience panic-stricken fear, as in a phobia, while knowing that there is no danger. Jerry Fodor characterized perceptual input modules as “cognitively impenetrable,” meaning that their rapid operations are not directly governed by conscious reasoning or overarching beliefs (Fodor, 1983). Similarly, John Tooby and Leda Cosmides argued that the brain contains specialized, evolved computational mechanisms that can operate automatically (Barkow et al., 1992). Neural systems involved in threat processing may therefore be activated reflexively in response to a threatening stimulus. Although prefrontal-amygdala connectivity is dynamically modulated during cognitive emotion regulation, rational knowledge alone may not immediately interrupt the initial emotional response. Such partial compartmentalization helps explain why a phobia can persist despite knowledge of the objective absence of danger.

By contrast, for Spinoza, an affect comprises both a bodily affection and the idea of that affection. Forming a clear and distinct idea of a passive affect causes it to cease to be a passion, although it does not necessarily eliminate it (*Ethics* V, Proposition 3). Modularity calls into question the primacy of cognition in the treatment of affects by showing that explicit knowledge does not necessarily transform an automatic emotional response immediately. Whereas modular theories conceive the mind as comprising interacting specialized systems, Spinoza maintains that the mind is the idea of the existing human body (*Ethics* II, Proposition 13). Consequently, according to Spinoza each affect is not the product of a separate faculty but a specific variation in the mind’s and body’s power to act—that is, a singular expression of the *conatus* through which the individual perseveres in being.

I also recall that Jaak Panksepp identified seven basic affective systems rooted in specific subcortical structures, demonstrating that anger and joy are based on distinct and complex neural networks. The PLAY system,

which designates one of the brain's basic emotional systems underlying social play, enjoyment, and playful interaction, especially in mammals. constitutes a rudimentary neural circuit (located in the thalamus and the basal ganglia). It generates the positive affects associated with social interaction and play in all mammals, whereas disgust mobilizes distinct sensory avoidance circuits (Panksepp, 1998). Regarding reactive anger, it has been shown that it results from an imbalance between the mechanisms originating in the amygdala, which generates emotion, and those of the orbital prefrontal cortex, which enables and regulates the expression of anger (Blair, 2012).

According to *Ethics* III, Definition III, "affect" refers to the affection of the body by which its power to act is increased or diminished, together with the idea of this affection. Spinoza thus establishes an inseparable psychophysical link between mind and body, since they are one and the same thing expressed through two distinct attributes; consequently, any specific bodily change is necessarily identified with a corresponding idea in the mind. Contrary to this approach, neuroscience has discovered profound plasticity in emotional circuits, (Davidson & Begley, 2012) which varies depending on lived experience. Emotion thus emerges as a dynamic and ever-changing prediction. It is not the expression of a fixed bodily state, but a cerebral construct in perpetual flux capable of completely altering the neurological state, depending on the specific context of each emotion. A closer examination of the biological foundations of affect reveals that the affinity between Spinoza's *conatus* and the contemporary neuroscientific model is largely superficial. Barrett's concept of the "body budget," (Barrett, 2012) the allostatic process by which the brain anticipates the body's needs and regulates its energy resources, concerns the organism's physiological self-maintenance. In this limited respect, it resembles the Spinozist striving to persevere in being (*Ethics* III, Propositions 6–7). By contrast, the body budget designates a specific neurophysiological regulatory process, while the *conatus* is a general ontological principle governing every finite being. In fact, this resemblance extends only to the cognitive dimension and does not encompass the affective or bodily dimensions. Whereas Spinoza posits a necessary and universal psychophysical identity—according to which every precise modification of the body is identified with a specific idea of the mind (*Ethics* III, def. III)—Lisa Feldman Barrett's theory of the predictive brain introduces a radical critical break. Barrett argues that the brain does not merely reflect fluctuations in the body's energy balance. Raw affect, understood as a basic representation of the organism's energetic state, is initially an undifferentiated biological signal. Emotional experience is actively constructed through the interpretation of bodily and contextual information considering prior experience and culturally acquired

patterns. (Mesquita et al., 2016). By rejecting the notion of discrete, universal emotional systems in favor of a theory of emotions as predictive conceptual constructions, Barrett fundamentally challenges the rationalist assumptions underlying the *Ethics*. From this perspective, anger is no longer the necessary manifestation of a universal law of human nature but an emotion actively constructed by the brain through culturally learned concepts applied to bodily affect (Barrett, 2012).

According to Spinoza, affects arise from the *conatus*, which consists of moving toward a greater or lesser degree of perfection according to a logic of linear power. By contrast, contemporary neuroscience commonly models emotional processes as distributed, dynamic, context-sensitive, and often nonlinear. The discovery of distributed and integrated neural networks thus challenges the assumption that affects can be classified into fixed and discrete categories. Rather than corresponding to stable emotional types, affects emerge from dynamic patterns of neural interaction whose boundaries are fluid, context-dependent, and continuously reconfigured. From this perspective, the systematic taxonomy of the affects developed in the *Ethics* appears considerably more rigid than the model suggested by contemporary neuroscience. Indeed, brain function is governed by a constant dynamic aimed at minimizing prediction errors. On predictive-processing accounts, emotions can be modeled as context-sensitive states within ongoing flows of sensory evidence and prediction; this cautions against treating any philosophical taxonomy as a direct neural taxonomy. Contrary to a rigid geometry of emotions, the brain is viewed as a self-organizing system that adapts in a nonlinear manner (Friston, 2009).

In this respect, contemporary neuroscience does not simply confirm Spinoza's thesis that the mind expresses the states of the body. Instead, it reconceives this relationship by arguing that the brain actively predicts, interprets, and constructs the meaning of bodily signals, rather than merely reflecting them (Barrett, 2017). Emotions do not stem from a fixed and universal psychobiological correspondence, but from a dynamic construction of the mind. They depend entirely on the learning context and the experiences of each individual (Barrett, 2017). Neural activity can exist without any direct somatic experience, and cognition is capable of modifying neural activity through a mechanism of active adaptation—known as allostasis—by which the organism adjusts its internal parameters in response to environmental pressures, whether physical or psychological (Sterling & Eyer, 1988). Unlike strict homeostasis, which Ravven identified in Spinozist naturalism, (Ravven, 2003) allostasis involves a dynamic change through which stability emerges from change (Arminjon, 2016). Thus, the brain anticipates the body's needs via allostasis even before receiving sensory signals. The brain interprets

sensory data in light of past experiences, which undermine the Spinozist psychophysical identity in which the mind is the necessary idea of the body's affections (Barrett, 2017). Furthermore, this process challenges the classical model by reversing the traditional hierarchy between perception and action: the brain does not passively react to a stimulus and then act; rather, it prepares the motor action even before conscious perception takes place (Hohwy, 2013). Thus, the brain manages uncertainty through sensory signals, and the resulting action is part of a mechanism that refines internal predictions, rather than being a mere reaction to afferent perceptions. (Clark, 2015).

Spinoza advocates for complete determinism, in which every mental state is the necessary expression of a bodily state, which is itself determined by an infinite chain of causes. However, contemporary neuroscience shows that the brain is highly plastic, that neural circuits reconfigure themselves based on experience, that learning transforms the very structure of the nervous system, and that cognitive circuits are not strictly determined by fixed laws.

These findings therefore do not refute Spinozist determinism; rather, they require any contemporary naturalistic reconstruction of it to accommodate individual variability, developmental contingency, nonlinear dynamics, and neural stochasticity (Damasio, 2003). Contrary to Spinozist monism—which posits that mind and body are two expressions of a single substance, and which draws a parallel between the ideas of the attribute of thought and the bodily states of the attribute of extension—neuroscience shows that there are dissociations between neural activity and subjective experience, as well as phenomena of neural unconsciousness (processing without awareness) (Tranel & Damasio, 1985). Perceptual illusions and unconscious processing demonstrate that conscious experience need not transparently track peripheral bodily states; they do not establish that a mental state lacks any neural or bodily realization (Chalmers, 1996).

More generally, contemporary neuroscience suggests that the relationship between neural and bodily processes is not strictly symmetrical. Neural activity may precede or occur without conscious awareness of bodily states and may, in certain contexts, be modulated independently of overt changes in peripheral physiology.

The emotion of anger constitutes a particularly revealing test case for assessing the relationship between Spinoza's theory of the affects and contemporary neuroscience, highlighting both their points of convergence and their significant divergences. Having defined the affects as "affections of the body" that increase or decrease an individual's power to act,¹⁸ he

¹⁸ Spinoza, *Ethics* III, definition III

conceives of anger (*ira*) as an affect derived from sadness, accompanied by the desire for revenge.¹⁹ Anger is not a moral vice, but a natural phenomenon, subject to the universal laws of nature; and that is why one must not condemn anger but only explain it. Indeed, “the affects of hatred, anger, envy... follow from the same necessity as other singular things” (*Affectus igitur Odii, Irae, Invidiae, etc.*) when considered in themselves, follow from the same necessity and power of Nature as other singular things.”²⁰ Spinoza distinguishes between active affects, which express the individual’s own power, and passive affects resulting from external causes. Anger belongs to this second category: it is a sign of passivity and a diminution of the power to act. Insofar as it is a form of sadness, it expresses a limitation of our being. However, Spinoza does not call for the eradication of anger. On the contrary, he asserts that passions cannot be suppressed by an act of the will, which is illusory, for “In the Mind, there is no absolute or free will.” (*In Mente nulla est absoluta sive libera voluntas*).²¹

Spinoza’s approach to anger appears problematic considering neuroscience. Indeed, Jonathan Haidt, without directly referring to Spinoza, has challenged the primacy of reason by proposing a model in which the intellect does not govern emotion but serves it. While the Spinozist sage uses reason to master anger by understanding its natural necessity,²² Haidt reverses this hierarchy. He then uses the metaphor of the *rider* (reason) and the *elephant* (the passions) to show that when a person experiences anger, their intellect does not seek the truth behind this emotion, but rather sets to work constructing *post hoc* justifications, thereby demonstrating that the rider actually validates what the elephant feels and expresses through its passion. Reasoning here does not serve the truth; on the contrary, it serves to provide arguments that justify the passion (Haidt, 2012). From this perspective, Spinoza’s confidence in the transformative power of causal understanding is called into question, since contemporary neuroscience suggests that conscious causal explanations often emerge after the affect itself, functioning more as rationalizations of emotions rooted in primary neurobiological mechanisms than as their true source (Nisbett & Wilson, 1977).

The study of amygdala circuitry provides a new perspective from which to reassess Spinoza’s intellectualism. Joseph E. LeDoux’s identification of a direct thalamo-amygdala pathway demonstrates that emotionally salient stimuli can elicit rapid affective responses before cortical processing has taken place, thereby suggesting that certain emotional reactions initially unfold independently of conscious rational

¹⁹ Spinoza, *Ethics* III, Definition of the Affections, 20

²⁰ Spinoza, *Ethics* III, Preface

²¹ Spinoza, *Ethics* II, 48

²² Spinoza, *Ethics* IV, 59, scholium

evaluation (LeDoux 1996, 163–165). He has shown that there is a neuroanatomical asymmetry between the emotional systems (centered on the amygdala) and the cognitive systems (the neocortex). This calls into question Spinoza's proposition—which I recalled earlier—that an affect ceases to be a passion when we form a clear and distinct idea of it ²³ Indeed, ascending neural projections from the amygdala to the cortex are more numerous and denser than the descending projections that extend from the cortex back to the amygdala. Because reason has only limited control over the emotional centers, a change in passion involves unconscious or behavioral processes rather than mere intellectual analysis (LeDoux, 1996).

Similarly, it has been shown that people are often unable to explain why they judge an action to be wrong. There is a dissociation between the processes that generate our value judgments and those that generate our conscious justifications after the fact. As a result, rationalization often consists in inventing reasons after the fact—for example, after a tantrum—to justify one's behavior. When we try to explain an outburst of anger, we come up with explanations that, while plausible, are often false. However, even once these have been refuted, the emotional judgments persist (Marc Hauser, 2007). Far from being a mental error, anger functions as an adaptive alarm signal. Research by Graham, Haidt, and Nosek has shown that it stems from innate moral foundations such as justice or loyalty. Anger is the automatic biological reaction that is triggered when these preprogrammed moral structures are violated by an external situation. It thus constitutes a cognitive response aimed at defending the integrity of our fundamental values (Graham et al., 2009). This is why it is virtually impossible to reason with an emotion (Greene et al., 2001).

Taken together, these findings suggest that the Spinozist conviction that adequate knowledge can transform the affects finds little support in contemporary affective neuroscience. Although understanding the causes of an emotion may alter its cognitive appraisal, it does not directly modify the automatic neurobiological processes that generate it. By contrast, as I shall argue, Maimonides develops a fundamentally different therapeutic model. Instead of confronting the affect primarily through intellectual understanding, Maimonides seeks first to regulate it through disciplined behavior, allowing repeated action gradually to reshape emotional dispositions.

The Status of Anger in Spinoza and Maimonides

²³ Spinoza, *Ethics* V, 3

While the Stoic sources of Spinozism have been highlighted, (Kristeller, 1984) Spinoza adopts a perspective that is radically different from this philosophy when he addresses anger. For Seneca, for example, anger is a kind of madness that stems primarily from a conscious choice (Seneca, 2010). It begins with a provocation—such as an insult—but it becomes a passion only if the mind gives its consent (*assentio*). This is why a person remains responsible for their anger (Graver, 2007). For the Stoics, the remedy is primarily a matter of willpower, as it would be for Maimonides. It involves exercising one's reason to reject the idea that external events (insults, losses) can affect the individual (Sellars, 2003). By contrast, according to Spinoza, emotions are not overcome through an act of will but by a stronger affect arising from reason. His therapeutic model rests on the acquisition of adequate ideas: by understanding that another person could not have acted otherwise, passive emotions such as anger are gradually transformed into active affects, allowing passion to give way to action (Steinberg, 2018). Anger is a sign of powerlessness,²⁴ whereas the remedy for anger lies in the formation of clear and distinct ideas (*claram et distinctam*),²⁵ which enable one to understand the necessity of the affects and to have greater power over them (*majorem in affectus potentiam habet*).²⁶ According to Spinoza, one does not choose to cease being angry by an act of will; rather, anger gradually subsides through an adequate understanding of its causes. As such, anger is not a moral vice but a natural phenomenon governed by the necessary laws of nature. The therapeutic process does not transform the individual's essence but changes the mode in which that essence is expressed, replacing passive passions with active affects. Finally, Spinoza maintains that all affects ultimately derive from three fundamental affects—desire, joy, and sadness. The apparent diversity of emotional life thus reflects only different combinations and degrees of these primary affects, each corresponding to variations in the individual's power of acting (*Ethics* III, General Definition of the Affects).²⁷ Consequently, anger is not an independent emotional system. Rather, it is a secondary affect that arises from the *conatus*, as the individual's power to act continually increases or decreases. Spinoza asserts that “The affects of hatred, anger, envy, etc., follow from the same necessity as other singular things” (*Affectus odii, irae, invidiae, etc., ex eadem necessitate ac reliqua singularia*).²⁸ Contrary to what Maimonides posited, for Spinoza, anger cannot be transformed

²⁴ Spinoza, *Ethics*, IV, 45

²⁵ Spinoza, *Ethics* V, 3

²⁶ Spinoza, *Ethics* V, 6

²⁷ Spinoza, *Ethics* III, General Definition of the Affections.

²⁸ Spinoza, *Ethics*, III, Preface

through education and discipline, but must be understood and then dissolved through adequate knowledge.

A later comparison with psychoanalysis helps clarify the distinction between intellectual understanding and genuine affective transformation. Freud's distinction between remembering and "working-through" suggests that becoming intellectually aware of the origin of a psychological difficulty is not sufficient to overcome it. The subject may understand a conflict and yet continue to reproduce the same emotional reactions and patterns of behavior. For Freud, therapeutic change therefore requires a process in which these recurring patterns are repeatedly confronted and emotionally worked through. In this limited respect, a comparison with Maimonides can be illuminating. Maimonides likewise does not reduce the correction of the passions to the mere acquisition of theoretical knowledge. Intellectual recognition must be accompanied by a gradual transformation of dispositions, habits, and affective responses. The parallel thus concerns the general distinction between knowing what produces a problematic affect and actually modifying the psychological pattern that sustains it. Freud's concept of working-through provides a later conceptual vocabulary for articulating this distinction. This comparison, however, is primarily heuristic and should not be understood as establishing a direct historical continuity between Maimonidean psychology and Freudian psychoanalysis (Freud, 1958)

Maimonides places his analysis of anger within the broader framework of his theory of virtues, as set forth in the *Mishneh Torah, Hilchot De'ot* (Maimonides, 2024). Drawing inspiration from Aristotle, he asserts that character traits must strive toward the *golden mean*—a balance between excess and deficiency. He also borrows from Abu Zayd al-Balkhi (850-934) the techniques for neutralizing anger through a stronger emotion, such as fear, (Badri, 2013) but prescribe also therapy based on behaviors opposite to those that should be modified (Maimonides, 2024). Spinoza would partially adopt this idea, stating that "an affect cannot be reduced or removed except by a contrary affect, and one stronger than the affect to be reduced" (*Affectus nec coerceri nec tolli potest nisi per affectum contrarium et fortiolem affectu coercendo*)²⁹. However, this prescription remains within a purely cognitive framework, for "an affect, called a passion of the soul, is a confused idea (*affectus qui animi pathema dicitur, est confusa idea*) through which the soul affirms the body's power to exist."³⁰ Spinoza's therapeutic model does not prescribe a practical discipline designed to reshape the affect through repeated behavior. Instead, it relies primarily on the transformative power of adequate knowledge. By

²⁹ Spinoza, *Ethics*, IV, 7

³⁰ Spinoza, *Ethics* III, General Definition of the Affections

contrast, Maimonides recommends the repeated performance of contrary actions as the primary means of correcting emotional dispositions before intellectual perfection is attained (Maimonides, 2021b). From this perspective, Spinoza's therapy remains predominantly cognitive, whereas Maimonides grounds emotional transformation in disciplined behavioral practice.

The contrast between Spinoza and Maimonides concerning the therapy of anger reflects a deeper disagreement about the very nature of anger itself. This divergence becomes even more apparent in their respective interpretations of divine anger. Whereas Spinoza denounces the superstitious belief that human misfortunes result from the wrath of the gods (*dii irati*),³¹ or that prodigies signify divine anger (*iram indicat*),³² Maimonides had already argued that the emotional attributes ascribed to God in Scripture must never be understood literally (Maimonides, 1977). Divine wrath is therefore not a genuine passion but a pedagogical metaphor intended to guide human conduct. Consequently, the ideal of *imitatio Dei*, or “walking in God's ways.” (*we-halakta be-derakaw*), (Maimonides, 2024) consists not in reproducing divine anger but in imitating God's loving-kindness, justice, and righteousness (Maimonides, 1977).

On the question of anger, Maimonides opposes Aristotle, who asserts that anger can constitute a virtue when applied for good reasons. (Aristotle & Crisp, 2014) According to Maimonides, anger cannot be accepted, even under certain circumstances, but must be completely eradicated. Thus, a person must distance themselves from anger to the very opposite extreme (Maimonides, 2024) because, according to the Talmud, anger is comparable to idolatry, since it introduces a “foreign god” (*'El Zar*) into the balanced soul.³³ Indeed, the angry person completely loses rational control of himself, to be thus alienated by external forces. For Maimonides, anger is not only a moral vice and a religious transgression, but also a disease of the soul. Furthermore, since human perfection is linked to the intellect, anger—as an uncontrolled passion—prevents the soul from rising toward the knowledge of God, which requires a balanced and purified intellect from all external and bodily influence. Anger is therefore an obstacle to the ultimate purpose of human existence. In contrast, for Spinoza, God is Nature itself (*Deus sive Natura*)³⁴ Human beings cannot, therefore, imitate God, but can only understand that they are a part of nature. Anger is not a deviation from a divine model, but a simple expression of natural causality.

³¹ Spinoza, *Ethics*, Appendix

³² Spinoza, *Tractatus Theologico-Politicus (TTP)*, Preface, 2, G. III, 5

³³ Talmud Bavly, *Shabbat*, 105b

³⁴ Spinoza, *Ethics* IV, Preface

Maimonides proposes a true asceticism of anger. While he recommends not giving in to anger, he nevertheless permits feigning anger when a forceful reaction is necessary, to correct others without being affected internally (Maimonides, 2024). This strategy reflects a proactive approach to self-control. Reason must govern passions, and anger must be kept at a maximum distance, for anger is a moral evil, a spiritual danger, and an obstacle to knowledge. It must be combated through rigorous discipline aimed at rectifying the soul. Maimonides explains that anger prevents access to knowledge and intellectual perfection, (Maimonides, 1977) therefore anger is not merely an emotion: it is an epistemic obstacle.

Maimonides and the Therapy of Emotions

Maimonidean moral psychology exhibits conceptual affinities with later behavioral and cognitive-behavioral approaches by integrating the rational correction of beliefs with the systematic cultivation of virtuous habits to overcome destructive emotions. This approach presupposes the reality of free will, which Maimonides considers the indispensable prerequisite for the healing of the soul. Human beings are therefore not condemned to remain captive to either their passions or the conditioning effects of a detrimental environment (Maimonides, 2021a). Rather, through the exercise of free choice and the practice of repentance (*teshuvah*), they are able to revise their beliefs, reform their character, and restore their moral and spiritual integrity. It thus helps to strengthen self-confidence and to take a fresh look at others and the world. It should be noted that Heidi M. Ravven has attempted to draw parallels between the naturalistic and deterministic aspects advocated by Maimonides and Spinoza's necessitarianism, in order to defend what she calls "moral agency without free will," which she argues is common to both authors (Ravven, 2013). I believe this thesis is debatable. Indeed, while Maimonides does indeed defend a natural philosophy inspired by Aristotle and al-Farabi, when it comes to the specifically ethical realm, he remains entirely faithful to the traditional Jewish affirmation of free will. Thus, he refutes the idea that God has decreed from all eternity that a person must be righteous or wicked (Maimonides, 2021a). He clarifies that while everything proceeds from God's will, at the same time, responsibility for one's actions lies entirely with human beings. Just as it is God's will that the natural world functions in a specific way, it is also God's will that human beings' ability to direct their actions stems solely from their own free will (Maimonides, 1977).

Regarding pathological behaviors, Maimonides shows that they are rooted both in erroneous conceptions that the individual has formed and in his poorly regulated emotions (Maimonides, 1977). His treatise, *The Eight Chapters*, systematically sets forth this therapy of the soul, based on

the logic of the Torah's commandments and on morality. This work emphasizes the role of the intellect (*sekel*), the correction of character traits (*mydot*), and the importance of habits (*hergelym*) for the radical transformation of behaviors (Maimonides, 2021b).

Maimonides' psychotherapeutic strategy seeks to cultivate rational patterns of behavior capable of reshaping both imagination and desire. As argued above, his therapeutic model anticipates several principles that later became central to cognitive-behavioral therapy, insofar as it assumes that beliefs and mental representations play a decisive role in the generation of emotions, which in turn influence behavior. From this perspective, the transformation of maladaptive beliefs and representations can lead to corresponding changes in emotional responses and behavioral dispositions. Similarly, Maimonides' educational recommendations foreshadow certain principles later developed in behavioral psychology, particularly the use of positive reinforcement and the systematic formation of adaptive habits. Maimonides thus provides an ethical and practical foundation for positive behavior, enabling an understanding of motivational mechanisms such as, *mutatis mutandis*, those that would later be systematized by contemporary behavioral therapies. Although Maimonides does not present a cognitive behavioral therapy in the modern clinical sense, (Pies, 1997) he nevertheless provided the broad outlines of a genuine form of mental therapy (Kranzler, 1993). This therapy is based on the transformation of beliefs, habits, and emotions, while positing free will as a fundamental condition for any effective therapy. Maimonides grounds the normative structure of the Torah in the presupposition of human freedom. His argument is explicitly anti-deterministic—directed against astrological fatalism and necessitarian epistemologies—and is developed in tandem with a compatibilist treatment of divine omniscience in which foreknowledge entails no causal coercion (Maimonides, 1977). On this account, free will is not a psychological observation but a transcendental condition for the possibility of ethical and legal normativity within the Mosaic framework, as well as a condition for mental health.

Unlike Spinoza, who denies free will and interprets repentance and compassion as affects arising from inadequate ideas rather than as virtues in themselves, (Scharfstein, 1956) Maimonides assigns compassion a genuine therapeutic and ethical function. For him, compassion contributes to the balance of the soul and the cultivation of moral character, provided that it remains governed by reason. For Maimonides, excessive compassion can become misguided sentimentality, while a lack of compassion can lead to cruelty. (Maimonides, 2021b). The therapeutic value of compassion therefore lies in its rational regulation, in accordance with the Aristotelian doctrine of the mean, whereby virtue consists in

achieving the appropriate mean between the opposing extremes of excess and deficiency. This principle underlies Maimonides' moral psychology and highlights a fundamental divergence from Spinoza, particularly in their respective conceptions of repentance. Spinoza maintains that "repentance is not a virtue" (*Pænitentia virtus non est*; *Ethics* IV, Proposition 54), since it is a passive affect arising from inadequate ideas. Therefore, "who repents of what he has done is doubly unhappy or powerless" (*Pænitentia virtus non est sive ex ratione non oritur sed is quem facti pænitet, bis miser seu impotens est*), once because of the act committed, and a second time because of the regret he inflicts upon himself.³⁵ On the contrary, for Maimonides repentance (*teshuvah*) is the indispensable condition for moral and psychological transformation. Grounded in the doctrines of free will and moral responsibility, repentance is not merely an expression of remorse but a dynamic process of self-correction. By returning (*shuv*) to one's proper moral orientation, the individual undergoes a genuine *tyqun*—a process of moral restoration of both character and soul—thereby making lasting behavioral change possible (Frankel, 1998).

Based on free will, the technique advocated by Maimonides aims to strengthen personal motivation rather than rely on external coercion (Rappel, 1997). From a strictly psychopathological perspective, it has been demonstrated that the Maimonidean approach can be successfully applied to treat certain forms of *akrasia*, drug addiction, (Milshteyn, 2024) and depression (Gamliel et al., 2008). This recovery finds its formal articulation in the notion of associativity; $(a*b)*c=a*(b*c)$ (Pinter, 2010). As Jules Vuillemin has used algebraic structures to illuminate philosophical forms of freedom; the analogy, however, must be stated precisely. Associativity does not make an operation independent of the order of its terms. Rather, for a binary operation $*$ it means that, for fixed ordered elements a , b , and c , regrouping the composition does not alter the result: $(a*b)*c = a*(b*c)$. The order a , b , c is preserved; what changes is only the placement of parentheses. Philosophically, the relevance of this property is therefore not an alleged escape from temporal sequence but the possibility of integrating successive determinations into a coherent composition whose outcome is stable under regrouping. This makes associativity useful here as a formal analogy for diachronic self-formation: earlier acts, present correction, and future dispositions can be understood as moments of one structured process rather than as isolated events (Vuillemin, 1962). *Teshuvah* can therefore be described, only by analogy, as having an associative structure in which past, present, and future remain connected. This algebraic analogy does not mean that repentance

³⁵ Spinoza, *Ethics*, IV, 54

erases their temporal order, nor that algebra itself provides a proof of libertarian free will. It reorganizes how successive acts are integrated into a continuing practical identity. In this restricted sense, the formula models the compositional coherence of moral transformation and prepares the later neuroscientific discussion of how repeated actions are progressively integrated into stable habits. The mathematical model is central to the argument because associativity provides a precise formal language for explaining how successive acts can be linked into a continuous and coherent process without losing their individual order. Applied analogically to *teshuvah*, it shows how repeated acts of correction may progressively form a stable pattern of transformation connecting past, present, and future conduct. The neuroscientific account of corticostriatal learning then complements this formal model by identifying a possible biological mechanism through which repeated actions become stabilized as enduring patterns of behavior. In *Hilkot Teshuvah*, Maimonides identifies free choice (*behyrah*) as a fundamental principle (*iyqar gadol*), the meta-legal axiom upon which the entire legal edifice rests. The epithet '*iyqar*' signals that freedom is not a contingent doctrine but a transcendental condition of possibility: without it, the notions of commandment (*miçwah*), justice (*çedeq*), reward (*sakar*), and punishment (*'onesh*) collapse. On this account, libertarian freedom functions as the *ratio essendi* of the legal (halakah) discourse itself: the pillar that supports the Torah's entire normative architecture (Shatz, 1997)

All of these notions are systematically rejected by Spinoza. For him, free will is an illusion arising from ignorance of the causes that determine human actions.³⁶ Following the destruction of the Hebrew Commonwealth, the ceremonial law of the Torah lost its binding political authority.³⁷ Likewise, he rejects the traditional doctrines of divine justice, reward, and punishment, maintaining that beatitude "is not the reward of virtue, but virtue itself" (*non est virtutis praemium, sed ipsa virtus*).³⁸ Finally, justice and injustice are not moral but political concepts, since they "can only be conceived within a state" (*non nisi in imperio possunt concipi*).³⁹ That is why, in his seventh dogma of the universal faith, intended like other dogmas to strengthen social cohesion, Spinoza states that "Finally, God hands over their sins to those who repent (*Denique Deum poenitentibus peccata condonare*)"⁴⁰

Maimonides describes how emotions and desires, if not governed by both the Torah and reason, lead to erroneous actions. By first asking to

³⁶ Spinoza, *Ethics* I, Appendix

³⁷ Spinoza, *TTP*, XIX, 6

³⁸ Spinoza, *Ethics* V, 42

³⁹ Spinoza, *TTP*, II, 23, Letter 19 to Blyenbergh

⁴⁰ Spinoza, *TTP*, XIV, 10

correct behaviors, then he presents a framework in which rational beliefs and correct conceptions can reshape imagination and desires, thereby transforming emotions and behaviors through cognitive restructuring. Thus, Maimonides may be regarded as a precursor of cognitive-behavioral therapy (CBT). In his *Treatise on the Eight Chapters*, (Shabtai et al., 2016) he develops a therapeutic model based on the assumption that beliefs and patterns of thought shape emotional responses and behavior. This framework already contains several principles that Aaron T. Beck would later formulate systematically in cognitive therapy in the 1960s, (Beck, 2019) and that contemporary cognitive-behavioral approaches would further develop. In Maimonides, however, these principles remain part of a broader moral and ethical project aimed not only at psychological well-being but at the overall perfection of human life (Bloch, 2001). Maimonides bases his therapeutic framework on the principles of the Torah, while conceiving the commandments as remedies for the soul modeled after medicine for the body. It is on this basis that he developed a framework for emotional regulation, combined with a dialectics-based habituation in which repeated action triggers therapist-directed behavioral activation. He aimed to establish a rational reframing of passions through a technique that could be likened to Cognitive Restructuring, for which Maimonides himself is said to have provided theoretical foundations (Pies, 1997). This clinical psychology involves correcting extremes and is presented as an effort aimed at genuine psychological and behavioral recalibration. If an individual suffered from an extreme character trait, the remedy was to engage in actions at the opposite extreme to eventually return to the healthy middle ground. Thus, if a person is stingy, they must, as a first step, force himself to be generous until generosity becomes a habit, which will then allow him to rebalance his behavior to reasonable proportions. According to Maimonides, a vice—such as extreme anger or pride—constitutes a psychopathological character trait, and behavioral change can influence emotional states. Therefore, this therapy enables patients to replace negative, imaginative thoughts with rational, positive, and balanced ones.

Maimonides emphasizes that the commandments (*miçwot*) serve to correct passions, desires, and destructive behaviors, (Maimonides, 1977) while aiming to optimize the individual's social adaptation (Maimonides, 1977). Because moral dispositions (*mydot*) are governed by the Law (*halakah*), (Maimonides, 2024) the therapy of the soul also involves both a legal and a ritual dimension. Vices are presented as diseases of the soul that result primarily from transgressions of divine Law (Maimonides, 2021b). Human beings are endowed with genuine free will, and this is why, according to Maimonides, humans are not condemned to follow their impulses or habits. As I noted above, free will allows repentance

(*teshuvah*) to function effectively as a therapeutic and spiritual process. It involves the acknowledgment of wrongdoing, regret for having committed it, and a future commitment not to repeat it (Maimonides, 2021a).

Spinoza assigns knowledge alone the task of healing the emotions and attaining human freedom (*libertas humana*), while denying that character can be changed through a free decision. By contrast, Maimonides holds that psychological distress can be overcome through voluntary action and repeated practice. His approach is first and foremost normative and behavioral, and only then does human intellect become capable of truly guiding the actions it deems reasonable and desirable to carry out. For reason to prevail over the passions, a person must first transform his behavior, and then, consequently, his thoughts, while recognizing that religious and ritual practice serves as a therapeutic framework for disciplining the body and mind.

According to Maimonides, the “correction of character traits” (*tyqun ha-myddot*) enables a person to take charge of his mental health. Only the Law and its repeated practice through habit (*hergel*) are capable of protecting the intellect from any emotional disturbance (Maimonides, 2024).

The Neuroscientific Approach to Anger

Some scholars have sought to compare Spinoza’s and Maimonides’ respective approaches to anger with the findings of contemporary neuroscience, despite the somewhat anachronistic nature of such an endeavor. Indeed, by studying the neural circuits of anger, its plasticity, and its cognitive modulation, neuroscience now allows us to examine these two thinkers in a new light and thus compare their therapeutic perspectives. It shows that anger implies specific neural circuits, notably involving the amygdala, the hypothalamus, and the periaqueductal gray (PAG), as well as neurotransmitters such as norepinephrine, testosterone, and vasopressin. It implies also some cognitive triggers that enable, for example, the interpretation of an act as offensive, thereby eliciting an angry reaction. These findings invite a comparison between Maimonides’ habit-modification therapy and long-term potentiation (LTP), whereby repeated or coordinated neural activity produces lasting increases in synaptic strength. This is a phenomenon of progressive synaptic strengthening based on an individual’s actions. It reflects the ability of chemical synapses to modify their strength, insofar as memories are believed to be encoded through changes in synaptic networks. This principle of long-term potentiation is considered one of the major cellular mechanisms underlying learning and memory (Cooke & Bliss, 2006). Consequently, when faced with an outburst of anger, if the individual responds with “gentleness”—a behavior mediated by the motor and

prefrontal systems—he then forms new neural pathways that ultimately inhibit the amygdala’s automatic response. Mental and behavioral training alters the physical structure of the brain, where habit leaves a specific physical trace (Doidge, 2007). Similarly, and contrary to what Spinoza would argue, Maimonides conceives of the human soul as perfectible, transformable, and educable. Human beings do not have a fixed essence but are shaped by their actions. This has been confirmed, notably by Joseph LeDoux, who demonstrated that anger and fear are based on distinct circuits involving the amygdala, the hypothalamus, and the periaqueductal gray matter (LeDoux, 1996). Similarly, an autonomous rage system—distinct from the fear or seeking systems—has been identified, demonstrating that the possibility of frustration, from which anger arises, stems from neurodynamic activities in higher brain areas. These involve computational-psychological processes linked to the cognitive functions of the frontal cortex (Panksepp, 1998). Anger is induced by specific cognitive triggers, particularly those related to the perception of injustice or threat (Barrett, 2017). However, anger always involves both a cultural and a subjective component, which—contrary to what Spinoza posited—is not determined solely by a natural process. While it may be the same everywhere, it also depends largely on what people think or how they label it. Thus, if people in a culture agree that a certain combination of facial expressions (such as a scowl), bodily reactions (such as higher blood pressure), and thoughts (such as feeling offended) constitutes anger in a specific situation, then in that culture and situation, it *is* anger. But if these conditions are not met, then that combination of reactions will never be understood by those people as anger (Barrett, 2012).

The dominant neuroscientific framework used in what follows is therefore a distributed ‘many-roads’ model rather than a simple opposition between an emotional amygdala and a rational cortex. The amygdala is treated as one node within wider networks of salience, valuation, threat processing, memory, interoception, and regulation; prefrontal regions likewise participate in distributed control rather than functioning as a unitary center of reason. Accordingly, “top-down” processes refer to the influence of higher-level cognitive processes, such as thought and attention, on emotional and bodily responses, whereas “bottom-up” processes refer to the influence of sensory, bodily, and emotional signals on cognition. These terms describe two directions of interaction within brain networks; they do not prove that a free and independent mind can causally intervene in an otherwise mechanically determined brain. These findings do not contradict determinism or confirm Maimonides in a metaphysical sense. They show, more modestly, that anger is malleable and stems from emotional plasticity. Stanislas Dehaene has demonstrated that attention training reduces amygdala

activation and alters emotional reactivity (Dehaene, 2014). Norman Doidge has described cases of lasting functional reorganization following emotional regulation practices, (Doidge, 2007) and Michael Gazzaniga has shown that the circuits governing aggression and anger can be modified through social learning (Gazzaniga, 2012). Finally, according to Tor Wager and Lauren Atlas, beliefs modify pain via opioid circuits (Fabrizio Benedetti, 2005). These findings indicate that cognitive states can modulate bodily and neural processes within an integrated biological system, which is compatible with several deterministic and non-libertarian accounts of agency. They therefore create a difficulty only for a direct neuroscientific translation of Spinoza's prohibition of cross-attribute causation; they do not empirically disprove his metaphysics. The comparison is strongest at the functional level: contemporary evidence on plasticity, learning, and behavioral regulation is compatible with Maimonides' emphasis on disciplined practice, while also leaving room for Spinoza's insight that cognition can become affectively efficacious. Maimonides' model is thus not 'confirmed' by neuroscience; it offers a particularly useful historical analogue for thinking about moral formation and self-transformation through repeated action. than Spinoza, and his anthropology offers a more operational framework for thinking about moral formation and self-transformation.

Neuroscience shows that beliefs, expectations, attention, and cognitive interpretations can modulate emotional experience and regulation; it does not establish that anger is a single discrete neural entity or that such modulation is unconstrained. Maimonides' method for addressing the passions takes the form of behavioral therapy that subsequently enables cognitive reappraisal, whereby the intellect judges and corrects the representations of the imagination. By prescribing repeated action—allowing a second nature (*tev'a sheny*) (Maimonides, 2024) to emerge that transforms judgments—Maimonides can be compared with contemporary accounts of experience-dependent plasticity in which deliberate practice contributes to behavioral change. This is a functional analogy, not evidence that he anticipated a specific neural mechanism. Maimonidean virtue remains a normative and religious conception, whereas neuroplasticity is a descriptive biological process.

Maimonides, in his *Medical Treatises* and his *Guide for the Perplexed*, rejects the strict separation between body and mind. For him, the health of the body depends on the balance of emotions, which the physician must facilitate through the "Healing Force" (*Vis Medicatrix Naturae*) (Maimonides, 2010). Therapy consists of aligning reason with this force to maintain psychological balance by establishing the golden mean. Maimonides' practical sequence can be compared with modern models in which understanding is combined with behavioral change; the

comparison does not imply that he anticipated the relevant neural discoveries. In the *Treatise on the Eight Chapters*, Maimonides does not understand temperance simply as the restraint of undesirable impulses. Rather, the repeated control of such impulses is part of a process through which a person gradually transforms his character and develops more balanced dispositions (Maimonides, 2021b). As noted earlier, allostasis provides a contemporary functional parallel to this view: the brain is not a system that “endures” stimuli, but a predictive mechanism that adjusts its internal parameters (*allostasis*) to maintain the integrity of the organism (Sterling & Eyer, 1988). The practice of Maimonidean virtue can thus be viewed as an allostatic strategy, aimed at anticipating situations of emotional crisis in order to prevent any disruption of balance.

Maimonides develops a conception of emotional regulation based on reflection, moral education, and the transformation of mental representations. In retrospect, this approach can be compared to James J. Gross’s model, in which cognitive reappraisal alters the meaning of a situation and the emotional trajectory. However, it should be viewed as a conceptual convergence rather than a direct anticipation of a neuroscientific discovery. This control is activated by the dorsolateral prefrontal cortex (PFC), which modulates amygdala activity (Ochsner & Gross, 2005). Such cognitive reappraisal involves processing by the prefrontal cortex’s executive functions to reinterpret the meaning of a stimulus before an impulsive response occurs. By intervening early in the *appraisal* phase, this control alters the emotional trajectory, affecting both the subjective experience of the emotion and its physiological expression. For Maimonides, this intellectual mediation, followed by a behavioral change, transforms the primarily imaginative impulse into a rational judgment, thereby preventing any truly uncontrollable anger. He emphasizes the importance of repeating actions to transform one’s character. Indeed, behavior cannot be changed by a single act, but rather through its repetition (Maimonides, 2024). This can be compared with findings on experience-dependent synaptic plasticity and long-term potentiation (LTP). Repeated practice can transform neural organization, although Donald O. Hebb’s theory of learning does not establish a specifically moral neural circuit and does not show that acts of kindness possess a unique synaptic signature. Hebb’s principle is relevant more generally because persistent, coordinated activity can contribute to durable changes in connectivity. Thus, Maimonides’ therapy produced by new habits, can therefore be treated as a conceptual analogue of increasing behavioral automaticity. Repeated action may stabilize patterns of response, but virtue should not be reduced to a single synaptic configuration or described as literally short-circuiting anger (Hebb, 1949). Second nature is not merely a moral disposition, but the result of a

rewiring process that allows gentleness—replacing anger—to become the brain's new default reflex (Doidge, 2007). Research on affective neuroplasticity has shown that it is possible to train the brain to persevere, thereby transforming the subject's emotional system and aligning with Maimonides' behavioral method (Davidson & Begley, 2012). The conception of virtue as a synaptic habit is also corroborated by contemporary research showing that repeated action drives cortical reorganization, physically transforming the structure of the cortex and thereby establishing new, stable neural maps. Plasticity is an intrinsic property of the nervous system and can be driven by multiple forms of experience, including repeated practice; repetition is therefore important for habit learning but is not the sole trigger of plastic change (Pascual-Leone et al., 2005). *Self-directed* neuroplasticity allows individuals to deliberately influence the remodeling of their neural architecture through repeated mental and behavioral activities. In contrast to biological reductionism, which views the mind as merely an epiphenomenon of the brain, Doidge argues that cognitive processes—such as those that determine conscious choice—trigger molecular mechanisms leading to changes in synaptic connections. It is also worth noting the neurobiological studies on free will, which Spinoza denies. Goal maintenance and cognitive control recruit distributed networks including prefrontal and cingulate regions. These mechanisms provide a biological account of aspects of self-regulation, but they do not constitute a neural proof or biological basis of metaphysical free will. The *PFC* does not merely store information; it also maintains active representations of goals and rules of conduct through which the individual strives to control competing emotional signals (Miller & Cohen, 2001). This cognitive control helps inhibit impulsive responses from the amygdala. However, any voluntary effort simultaneously activates the anterior cingulate cortex (*ACC*), identified by Botvinick *et al.* as a key region within distributed networks for conflict monitoring and cognitive control. The *ACC* evaluates in real time the metabolic cost required to overcome a habitual impulse (Botvinick, 2001). Furthermore, Daniel Goleman popularized the concept of an "*amygdala hijack*" to describe the sudden onset of an intense emotional reaction that is difficult to regulate. Drawing in particular on the research of Joseph LeDoux, the underlying literature suggests that salient stimuli can rapidly engage distributed threat-related processing that includes the amygdala. Such processing can facilitate rapid defensive responses before or without complete conscious appraisal. The momentarily unbalanced interaction between emotional networks and cortical functions can then limit one's capacity for reflection and behavioral control. Thus, some affective responses can begin before reflective interpretation is complete, which helps explain why rational

understanding may not immediately control them (Goleman, 1995). Ann Graybiel's research shows that repeated learning can group sequences of actions into automated behavioral units, particularly within the striatal circuits.

The acquisition of a habit, however, relies on a sustained interaction between the striatum and the cortex, rather than a simple transfer of control from one to the other. Dopamine plays a role in this learning process, notably by signaling the motivational value of actions, without determining their moral character. These findings may thus shed light—by analogy rather than through scientific validation—on Maimonides' concept of "second nature," whereby repeated practice stabilizes virtuous conduct (Graybiel, 2008).

Finally, I would like to point out that deliberately performing a new or morally demanding action can strongly engage the attention and executive functions of the prefrontal cortex. With repetition, behavioral control reorganizes within the cortico-striatal networks, with increased involvement of the dorsolateral sensorimotor striatum.

Sequences of actions can then be grouped into functional units (*chunks*), facilitating a more fluid execution that requires less attention (Yin & Knowlton, 2006). Although they do not validate these findings retrospectively, they align with Maimonides' intuition that repetition gradually transforms virtuous conduct into "second nature." (Daw et al., 2006).

Conclusion

This article has compared the respective therapies of affects developed by Maimonides and Spinoza. Spinoza offers a sophisticated account in which adequate cognition becomes effective insofar as it participates in stronger affects and greater adequate causation; Maimonides gives a more explicit role to repeated practice, character formation, and repentance. Anger is therefore a productive case study because it reveals two different models of durable change: one centered on understanding necessity and the affective power of adequate cognition, the other on normatively guided action that, through repetition, becomes stable disposition. Therefore, this comparison supports a specific conclusion: contemporary empirical findings lend significant support to Maimonides's therapeutic account of emotional and character transformation, while exposing important limitations in Spinoza's therapeutic model, particularly its reliance on rational understanding as a means of transforming affects. This contrast does not, however, amount to an empirical confirmation or refutation of either thinker's broader metaphysical system. Contemporary neuroscience cannot adjudicate libertarian free will, Spinozist necessity, or psychophysical parallelism as metaphysical doctrines. The principal

interdisciplinary finding is that the Maimonidean notion of 'second nature' has a particularly fruitful functional analogue in contemporary work on habit formation and neuroplasticity. I have shown, using anger as a case study, that this emotion provides a revealing indicator of their anthropological, ethical, and theological differences. For Maimonides, anger is a moral vice and a spiritual obstacle, incompatible with intellectual perfection and the imitation of God. For Spinoza, by contrast, it is a natural affect governed by necessary laws and capable of being overcome through rational knowledge alone. This implication concerns mechanisms of change rather than endorsement of any religious doctrine. At the level of professional and policy practice, the historical comparison supports integrative approaches to emotion-regulation education that do not reduce behavior either to willpower or to neural determinism; however, no direct clinical or public-health recommendation should be inferred without prospective empirical testing of specific interventions. Affects. Future research should test more precisely the distinction developed here among conceptual convergence, functional analogy, empirical compatibility, and empirical confirmation. Comparative work could examine whether repeated counter-habit practice produces measurable changes in anger regulation, how cognitive reappraisal and habit training interact over time, and whether individual differences alter the balance between deliberate and automatic control.

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