MORAL INTELLIGENCE AND THE SOCIAL BRAIN

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Everything flows. Heraclitus of Ephesus.

ABSTRACT

140 years ago Charles Darwin suggested that moral agency emerges in animals with well developed social instincts and intellectual powers, such as primates and humans. His project has been significantly furthered by recent research in neuroethics, as exemplified in the work of Damasio. But some questions still need answering, namely, what its connections with several other intelligences, especially social intelligence, says about moral agency, and its neural supports in the brain; and what moral intelligence adds, if anything, to other intelligences. In response I will suggest that the biological and emotional intelligences are necessary to the emergence of moral intelligence, for the survival, reproduction and wellbeing of intelligent actors are substantive moral goods. While the communicative and social intelligences may appear to suffice to constitute moral intelligence, they do not, since they involve amoral functions. I conclude by proposing the hypothesis that the exchange of moral goods of survival, etc., is likely the prime function of moral intelligence, and constitutes an elaboration of general social intelligence that extends beyond one's own to other species. I then ask moral intelligence is innate, and whether any brain regions are exclusively devoted to supporting it. I conclude with comments that this view of moral intelligence takes us beyond conventional notions of moral duty, utility, virtue, altruism, and significantly advances the project of a moral science that dates back through Darwin to Aristotle.
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> The following proposition seems to me highly probable--namely, that any animal whatever, endowed with well-marked social instincts, would inevitably acquire a moral sense or conscience, as soon as its intellectual powers become …nearly as well developed, as in man. Charles Darwin. *The Descent of Man.*[1]

> The time has come for ethics to be removed temporarily from the hands of the philosophers and biologicized. Edward O. Wilson, *Sociobiology*.[2]

Evolution, Sociobiology, and Moral Intelligence

Edward O. Wilson's call reflects an understandable frustration at the lack of response by philosophers to Charles Darwin's "highly probable proposition", over a century ago, presented in his work on hnman evolution, the *Descent of Man.* Darwin's hypothesis has been largely ignored by philosophers, as Wilson noted. But Darwin's claim that the moral sense involves significant intelligence and social powers is significant and time. It is in part why I speak of moral intelligence, not rationality. The notion of moral intelligence reflects Howard Gardner's theory of multiple neuro-biologically enabled problem solving intelligences.[3] I will argue in the pages to come that moral intelligence, as Darwin and Wilson claimed, is more closely connected to the social and biological intelligences, than to psychological intelligence; and the moral brain is a communicative social brain, as neurological experts like Damasio, Dubin, Illes and others have shown. Their work represents a revolutionary paradigm shift in moral theory, as I will note in the conclusion. But while I agree with them that moral intelligence presupposes the social, biological, and psychological intelligences, I also contend that no intelligence, not even social intelligence, suffices to constitute the reciprocally altruistic exchanges involved in moral intelligence. I will conclude by

drawing some implications of these hypotheses for key notions in conventional moral theory, and conclude by discussing the question whether moral intelligence is innate or learnt.

Antonio Damasio identified the neuro-biological roots of moral intelligence; he wrote: "The construction we call ethics in humans may have begun in part with the edifice of bioregulation."[4] Bioregulation refers to the brain's lowly work of regulating the body's multiple organic and sensori-motor functions. Moral intelligence, Damasio claims,, begins with the dynamic brain-body partnership in intelligent organisms. That partnership, he adds, constitutes an "indissociable organism [that] interacts with the environment as an ensemble;" for the brain "is concerned specifically with the ability to anticipate the future and plan accordingly within a complex social environment" and survive. In addition to securing an organism's survival I suggest we added, securing its wellbeing and reproduction. That partnership has worked well, contends geneticist Theodosius Dobzhansky: "There is scarcely any doubt that the development of brain power, of intelligence was the decisive force in the evolutionary process, because brain power confers enormous adaptive advantages. It is brain power which makes man by far the most successful biological species."[5]

The human brain in addition enjoys a variety of social capabilities: interneuronal communications, neural mirroring, self image, body language, natural language, and social emotions. The brain, I note, enjoys truly impressive communicative powers, and this is the heart of the connectionist theory of the brain.[6] Every moment the 100 billion neurons of the human brain constantly communicate with each other, the body, and the environment,[7] combining trillions of neural messages into multiple, interconnecting neural networks. It is fundamentally mistaken to term this dynamically communicative organ a mere "physical system, a sort of machine", or to describe neural processes as "mechanistic."[8] For communication is what brains

do, not work. It moves messages around, not bodies. Work is what the muscles do, not the brain. On the contrary, it is the brain's impressive communication dynamics which enable it to respond flexibly to sensory reports of environmental data by rewiring its various cortices and revising its internal body map. The brain also enables intelligent actors to remember past experiences, learn new skills, plan courses of action, develop adaptive habits, and even overcome behavioural deficits such as lost limbs. It is because, as Judy Illes notes, "A given brain region" contributes to several mental functions and each function relies on numerous brain regions", that neural processes are so flexible. [9] Each neural region communicates with other regions, the body, and the environment. In consequence the communicative brain enjoys a neural plasticity that enhances the organism's environmental adaptability and survival chances. The impressive neural plasticity[10] of the brain shows that it is not rigidly programmed, as for instance insect brains appear to be. Indeed if functional neural regions were too specialized, the brain would have been all too much like a rigidly algorithmic digital computer. Animals and humans wouldn't be smart or flexible enough to adapt and they would not have survived.

The fact that humans are a social species leads Michael Gazzaniga to infer the view that "We must read the minds of others if [society] is to work."[11] The large primate brain is a social brain, as it must be if it is to support successful interaction with other intelligent actors.[12] While we can't read minds we can read body language; for only bodily behaviours can be observed and interpreted by other intelligent actors, not their mental processes. It is therefore not the mind but the body that is, as Gallese says, "the primary instrument of our capacity to share experiences with others." [13] Neural mirroring is perhaps the most interesting social behavioural communication capability enabled by the primate brain. Specialized mirror neurons "discharge both when a monkey performs a given motor act and when it observes a similar motor act done

by another individual."[14] In effect, writes Gallese, "to perceive an action is …to internally simulate it",for "the same neural structures involved in processing and controlling executed actions, felt sensations and emotions, are also active when those same behaviours are observed in other animals."[15] In addition body language lays a foundation for what George Herbert Mead termed the "transfer of gestural meaning …to abstract sound meaning." Gestures enable communication between intelligent actors, for, Mead wrote, the "conversation of gestures" constitutes "a direct link between the sender of a message and its receiver."[16] Over millennia in fact intelligent animals from bees and dolphins to crows and chimpanzees have developed a variety of communication systems, different sensory media: visual, gestural, chemical, and vocal/sonic, up to and including human language.[17] Take for example the sonar of a bat, vision of a hawk or a human, the nose of a wolf, or a cat's night vision. Body language prepares the way for the ultimate communicative competence of human language. It is so important a capability that two neural regions are hardwired to support it, namely, Broca's and Wernicke's areas. There are even mirror neurons in Broca's area for language, as well as motor and pre-motor cortical regions.[18] The brain also supports interactive social emotions such as empathy and understanding, feelings which enable actors to "figure out how others are feeling, what they intend and how they are likely to act, in part by putting ourselves in their shoes."[19] Their joy cheers us up, their pain saddens us, and humour is infectious. Such feelings are a value-laden morally relevant activity.

But Gazzaniga does not agree that the brain is the seat of social intelligence. Instead he claims that the social "aspects of our personhood are not in our brains", for "they exist only in the relations that exist when our automatic brains interact with other automatic brains. They are in the ether."[20] What ether, one asks? No clear answer or credible supporting evidence is offered.

Absent any empirical data or test, such abstract talk is a matter of faith, all too prone to committing Descartes' error.[21] Some forms of brain damage furthermore support the claim that the brain is the seat of social intelligence. It was brain damage (namely, to the ventromedial pre frontal cortex and orbital frontal cortex) that for example underlay Phineas Gage's uncontrollable anti-social behaviour.[22] Thus the hypothesis that the communicative brain is the seat of social intelligence enjoys empirical support. Indeed in a cognitive version of the golden rule we not only understand other people by neurally simulating their behaviour and feelings in ourselves, we also enhance self knowledge, as Mead said so well: "It is through taking the role of the other that [one] is able to come back on himself."[23] The communicative brain connects understanding others with one's own self image. It is a social brain and a powerful enabling platform for moral intelligence, in contrast to psychological intelligence.

Psychological Intelligence is the work of the communicative brain; for "the brain is the organ of the mind." [24] Psychological functions and capabilities like the senses, sensori-motor connections conscious sentience, emotional feelings, and voluntary intelligent behaviour are its products. The multiple sensory mode capabilities of the brain enable different species to receive and interpret messages from its environment in different media: visual, olfactory, tactile, aural, and kinetic. This arrangement tends to confirm Mead's view that our multiple sensory capabilities emerged at the interface between organism and environment, for that is where they best help biological actors to perceive and intelligently respond to environmental opportunities and threats.[25] Thus, as Sara Solla writes, a "critical function of our brains is to provide an interface with the external world. This interface has two fundamental components: the processing of sensory information and the control of movement."[26] Integrating sensory and motor functions is a good illustration of the brain's inbuilt "disposition for survival."[27]

Consciousness is best understood, I submit, as a form of sentient awareness, which is found in other organisms as well as humans. It is the product of typical evolutionary tinkering, building on capabilities already developed in previous species. Conscious sentience, Christof Koch claims, "is necessary for planning and choices among multiple courses of action", for it enables intelligent actors to "deal with …situations that require a novel, non-stereotyped response."[28] The unending streams of sensory messages are so rich and so important that they represent likely candidates for the neural basis of conscious sentience. Neurally, conscious sentience appears to be supported by the lower brain reticular formation and coalitions of neurons located in several regions of the brain.[29]

By performing the important psychological function of arousing and focusing attention on environmental threats and opportunities, conscious sentience advances natural selection by helping species survive. Environmental sentience is complemented by proprioception,[30] namely, an actor's intrapersonal sentience, or inner awareness of their body, its feelings, images, ideas, sensations and states. Proprioception satisfies an intelligent actor's need to sort out the voluminous stream of mental messages the brain constantly sends reporting the body's internal states, sensations, feelings and initiate appropriate responses. Conscious sentience does however have one critical limitation. It is a slower mode of response to environmental messages than unconscious sensori-motor responses. At 150 milliseconds, Libet found, the latter are three times faster than conscious responses—at 500 ms.[31] So conscious sentience is not always the most adaptive psychological response to environmental phenomena. Nor is it equal to the numerous complex tasks of neural bioregulation or fine motor coordination—which perhaps is why they are unconscious functions.

Conscious sentience builds on the multiple sensory message modes and their connection to survival enhancing motor responses. What we are most clearly aware of is not 'thoughts' so much as the stream of sensory messages about our body and the environment. Organisms have survived more because they enjoy multiple sensory capabilities for receiving and interpreting messages about environmental opportunities and threats than because of any intrapersonal psychological capability for 'thinking.' An organism's conscious awareness of visual, aural, tactile, olfactory messages about environmental phenomena are much clearer sources of survival enhancing information than the vague dream-like thoughts of internal mentalizing. Indeed to the extent that an actor encloses itself in its mental reflections, it weakens its sensory receptiveness to messages from its environment. To the extent that inner-mindedness is accompanied by environmental absent-mindedeness it puts one's survival at greater risk. Thinking can be dangerous to one's health. Nor is reflective thinking an inherently moral function. On the contrary, such intrapersonal psychological functions serve amoral and immoral purposes as well as moral.

But psychological states like feelings and thoughts do not suffice to constitute social intelligence; for no purely *intrapersonal* 'theory of mind' can suffice to explain *interpersonal* social intelligence.[32] I therefore question John Searle's claim that the "primitive" psychological notions of "collective intentionality [which] 'we intend'… in my individual head" can of themselves "create an objective social reality."[33] One cannot constitute interactive social intelligence and its communicative capabilities merely by intending them. Sending messages internally, in one's head or 'mind' is not communicating with other actors.

The emotions are conscious feelings which arise as responses to environmental messages in terms of their survival implications; they involve, Damasio writes, "mental evaluative

processes," and "implicit social-emotional appraisals."[34] There are six primary emotions: anger, fear, disgust, surprise, sadness, and happiness. Happiness, the one unqualifiedly positive emotion—is of notable importance in Aristotle's ethics. It should be associated with survival and reproduction as well as wellbeing. Surprise is noteworthy inasmuch as it involves a cognitive response to messages reporting unexpected phenomena and events. One might moreover interpret the notion of moral duty as a motivation based on fear of future losses, harms, or penalties. In fact, Damasio contends, the brain appears to be hardwired to evoke an "unpleasant gut feeling" re imminent danger, which he terms a "somatic marker." The amygdala for example helps an intelligent actor to consciously respond to another actor's expressions of anger, fear and disgust, by linking attention with emotion. By evoking a "fight or flight" response to messages about potential dangers, the emotions function as the brain's defencive system .[35] In sum the emotions they enable actors to develop greater "flexibility of response" to perceptions of environmental threats and opportunities.[36] To the extent that they are driven by what Spinoza termed an actor's fundamental "desire" or "endeavour to persist in his own being", [37] that is, to survive, the emotions are morally relevant value-laden functions of psychological intelligence. They are, De Sousa notes, "cognitively and strategically rational" or intelligent feeling responses to environmental phenomena and events; and Damasio dr0061ws the corollary, namely that Indeed a "reduction in emotion may constitute an equally important source of irrational [that is, intelligent] behaviour."[38]

The voluntary control of one's own behaviour would be ineffective and useless absent and the brain's diverse capabilities for intelligently interpreting reams of incoming sensory messages from the environment and responding to them with appropriate behavioural strategies. Such decision making is not a simple matter, viz., of mere will power. On the contrary it

involves multiple executive functions: intelligently envisioning and intending goals, remembering relevant past experiences, voluntarily choosing from available options, initiating an appropriate course of action, doing it, then monitoring the gap between actual outcomes and intended goals, and intelligently learning to improve one's future performance.[39] Intelligent voluntary decisions and behaviours are not merely passive responses to external, environmental factors. On the contrary, they involve actively assimilating relevant information, and selecting and performing a course of action which best promises to secure one's ends, and enhance one's survival and wellbeing. Such behavioural powers are too complex to be reducible to a single simple function like a 'will.' In fact, Dubin notes, "no one [neural] region alone is the decision maker."[40] Since there is no neural basis for the will, there is no such thing as free will, certainly not if it is disembodied or metaphysically exempt from causal influence.

There are numerous uncontrollable pre-determined and compulsive, involuntary or unfree behaviours, such as for example conditioned reflex responses, behavioural tics, motor spasms resulting from brain damage, Tourette's syndrome, porphyria, psychological disorders such as autism, schizophrenia, a psychopathic lack of affect, obsessive-compulsive disorder, and other psychological disorders. Obsessive-compulsive disorders are for example the product of a neural process of "brain lock", involving several neural regions.[41] But even here we see some evidence of intelligent voluntary control, namely, in those OCD patients who have been able to learn to retrain themselves to overcome the compulsive forces they experience and gain some control over their behaviour.

Voluntary intelligent decision making is however at best a necessary rather than sufficient psychological condition of moral behaviour. For inner-directed, intrapersonal psychological functions such as thinking good thoughts or forming good intentions are not

themselves moral behaviours. Nor for that matter are deliberating before acting, reflective thinking, good intentions, logical or verbal consistency, sound reasoning, clear statement, self-development or self-actualization. Logical or mathematical reasoning, I note, is too precise and abstract to explain the environmental adaptability of the brain. Logic does not explain how organisms could develop neural plasticity or survive by adapting to unpredictable environments.[42] And moral intelligence is an evolutionary successful strategy.[43] Morality moreover is not a matter of psychological feelings or thoughts, individual or decision making, the capabilities of logical reasoning, mathematical calculation, general rationality, practical intelligence or Aristotle's greatness of soul.[44] Despite their powers however neither biological or psychological intelligences suffice of themselves to constitute moral intelligence. Even if they are practical, survival oriented, value laden intelligences, they still remain *intrapersonal psychological* capabilities, focused solely on the actor. So they are inadequate to the social altruistic and interpersonal requirements of moral intelligence, namely, of helping or benefiting others. In addition these intelligences and powers are involved in amoral and immoral as well as moral behaviours.

Moral and Social Intelligence

Only a social brain can support a moral brain; and indeed moral intelligence is especially close to social intelligence. Their closeness was heralded in the classical view that morality builds on social customs or *mores.* For Plato the four classic cardinal 'virtues' connect the individual and the social good.[45] Justice is an inherently social as well as moral virtue, a point to which I will return shortly. Courage is a high ranking social virtue only in military / warrior cultures like that of ancient Greece and Rome, not to mention the USA. To the extent that military values like courage encourage killing others however they conflict with that most fundamental of moral precepts, do no harm. Military courage therefore is not a core moral value.

Wisdom (*Sophia*) is presented as a form of good judgement or rationality, but it can be amorally instrumental, practical or technical as well as moral; and how it might lead to moral social practices of helping rather than harming others is not explained. Plato deemed temperate self mastery (s*ophrosune)* a moral virtue because he built his moral psychology on the rationalist presupposition that reason somehow controls the presumed less moral passions; but self control is found in amoral and even immoral actors. Moral emotions like empathy, compassion, understanding, care, duty, shame, guilt, embarrassment, disgust and indignation moreover are "intrinsically interpersonal" social feelings. [46] They involve empathetic responses to other's happiness or distress.

Despite their close interconnections social intelligence does not of itself however suffice to constitute moral intelligence. "Ethical behaviours are a subset of social behaviours", Damasio claims;[47] but, one must ask, what defines that subset? The reply is that moral intelligence requires one to value the lives and wellbeing of others, not just oneself. It takes one beyond self interest. Moral virtues are socially interactive interpersonal practices which contribute to the survival, wellbeing and reproduction of those involved. They are, Gallese writes, "grounded in the relational nature of our interactions with the world" especially with other actors.[48] But more is involved, namely, good social behaviour. Carol Gilligan interprets morality as taking care "that no one should be hurt."[49] In addition, Gilligan notes, care for others helps resolve social conflicts. Frans De Waal reduces moral intelligence to two key good behaviour injunctions, namely, to help others and not harm them.[50] This suggests that Libet is right when he says, "Only a motor act by one person can directly impinge on the welfare of another."[51] Only one's behaviour, one's bodily movements, note, can benefit others; not one's thoughts. Moral conduct therefore requires biological or bodily-kinaesthetic intelligence.[52] Actions, as the old proverb

says, speak louder than words, and thoughts. Moral conduct must therefore take the form of socially beneficial behaviour, behaviour which helps others, and doesn't harm them.

Since such behaviour should not harm oneself, moral intelligence involves reciprocity. This affects the scope of moral intelligence; it is, I submit, epitomized in *interactive social behaviours that benefit others as well as oneself*. This reflects Darwin's claim that the moral sense "naturally leads [to] the Golden Rule: Do unto others as you would have them do to you", for "what one does …for others, one does to and for oneself."[53] Moral actors respect the wellbeing and interests of others who will likely be affected by their behaviour, including animals and other organisms. If they are to foresee how one's likely course of action might affect others, or recall the outcomes of similar acts in the past moral actors need significant social intelligence. Since the Golden Rule requires actors to consider other's wellbeing as wellbeing and to exchange benefits it is an intrinsically interactive social injunction. To follow the Golden Rule then,one needs a powerful social brain; for Ridley writes, one needs to be "equipped with special faculties to enable it to exploit reciprocity, to trade favours and to reap the benefit of social living."[54] Only a social brain, not the intrapersonal0020mentalizing of psychological intelligence, can support the interactive social behaviours enabled by moral intelligence. And there are many such behaviours. Moral intelligence is evident in "a myriad of social and economic exchanges and compliance with social norms", all of which are made possible by social intelligence.[55] They take a variety of mutually beneficial, socially interactive behavioural forms: communication, cooperation, reciprocity, exchange, trade, mutual aid, and negotiating conflicts.[56]

The social view of moral intelligence suggests that the virtues are social in substance. it Justice for instance requires equity in reciprocal exchanges, the distribution of resources and

division of labour (what Plato meant by justice). It has in consequence extensive socio-economic and political-legal connotations. Utility or wellbeing extends to the impacts of one's behaviour on other actor's wellbeing. Duty has an interactive social dimension, namely, of mutual obligations, the obverse of mutual benefit. Mutual obligations are found in all manner of social institutional and organizational relationships, between workers and bosses, soldiers and officers, governments and the people, man and wife, parents and children, and friends. In each case duty is a social notion. It means one is answerable (or response-ible) and accountable to others for one's conduct.[57] Social accountability however is not itself an inherently moral practice; for the organizational structuring of roles and accountabilities is a common in armies and criminal organizations.

This socially interactive view of moral intelligence is not new; it goes back to Aristotle. It can be found in Peter Kropotkin's ground-breaking studies of mutual aid in animals and humans, Jean Piaget's finding that cooperation and autonomy are key elements in the child's moral development,[58] and Kenneth Boulding's claim that economic exchange is a more powerful organizing social value than threat. In addition Robert Trivers' groundbreaking research on reciprocal altruism identified moral intelligence with cooperative behaviour and beneficial exchanges such as communication, resource sharing, and "cleaning symbioses" in insects, fish, birds, animals, and humans, and also between different species. Altruism works best, Trivers claims when it is reciprocated and both agents and recipients benefit. It is, he writes, "a matter of if you scratch my back, I'll scratch yours."[59] The preconditions for reciprocal altruism are several, he adds: repeated interactions with other social animals, the ability to recognize conspecifics, interdependence, spatial closeness or density, sanction those who do not reciprocate, and a long life. The first two, I note, are expressly communicative capabilities, the

first three are social, the fourth, spatial proximity is a precondition of social interaction, and the fifth, sanctions, is a moral practice. All demand socially interactive intelligence.

Since exchanges of benefits between actors are complex social behaviours moral intelligence is not a simple or intuitive matter. Instead it demands the diverse capabilities of the social brain. Indeed one must, with Charles Peirce, question whether an intuitive, immediate and simple act is even possible.[60] Attempts to reduce morality to simple concepts or norms like duty or utility or the good are therefore doomed to fail. In contrast it seems that most psychological and social processes are complex, involve diverse capabilities, and are supported by multiple neural processes in the brain.

The survival, wellbeing and reproduction benefits exchanged in social interactions are moral goods, but such goods are fuzzy ambiguous notions. Ethics is in consequence a matter of social rather than technical ingenuity, logical certainty or technical precision.[61] No single, precise definition of good has been established. Instead, diverse pleasant, beneficial feelings sensations, pleasures, practices and experiences are associated with respecting and securing the survival, wellbeing and reproduction of others as well as oneself. This reflects Aristotle's view that ethics and happiness are ambiguous notions involving a variety of opinions, eg., about happiness, wellbeing, interests and other goods; and, he added, moral goods are rewarding in themselves. [62] While helping others is good for you, and often emotionally rewarding, moral conduct should not be based on 'external' rewards, such as money, status, pleasures, or power. Indeed conduct motivated by external rewards such as money, praise, advancement, etc., are to that extent that less moral in value.

Furthermore mutually beneficial forms of conduct such as cooperation, reciprocity, exchange, trade, and communication, involve positive synergies which reinforce group

interaction and the wide diffusion of moral practices through social space. Such beneficial forms of social interaction appear to be "automatically more profitable when performed in groups;"[63] for they tend to increase the benefits enjoyed by those involved. Reaping benefits moreover is a form of positive feedback. It tends to reinforce social bonds and trust between those exchanging benefits. By strengthening their communication and connections with other intelligent actors, moral intelligence also increases each actor's survival chances and wellbeing, and reinforces cohesion in and between social groups. The resultant synergies encourage them to repeat and improve such behaviours. They also explain why moral values and customs spread so widely and rapidly through social space. The generalizing capabilities of the social brain in addition enable intelligent moral actors to recognize other actors as similar to and communicate with them. This facilitates extending recognition of moral actors beyond kin and friends to strangers, foreign tribes and even to other species.[64]

Moral intelligence reinforces good behaviour and enables social life to be sustainable over time. To the extent that it increases one's survival chances, it helps lengthen one's life span. Absent moral intelligence, social life would not last long, and the survival of the group would be at risk.[65] So time matters morally, and social time limits on the realization of moral goods are needed. Short delays in reaping benefits: a few hours, days, or even weeks are commonly accepted, as long as the benefits are realized. Sooner, one hopes, rather than later. There is no moral value in forever delaying the benefits accruing from moral conduct. On the contrary, benefits long delayed are benefits denied, for long delays raise legitimate concerns that those benefits will never be realized. The more immediate and numerous its benefits are, the more the moral behaviour involved is encouraged, rewarding, repeated and diffused.

Moral intelligence enables actors not only to altruistically commit themselves "to living peacefully and cooperatively with others,"[66] but also to discriminate beneficial from harmful forms of social interaction such as murder, theft, lying, and cheating.[67] Such acts weaken and destroy social bonds. In fact harmful social acts are not the most typical or most frequent social behaviours.[68] On the contrary, criminal behaviours tend to decrease as group size increases and the benefits of moral conduct are communicated, and diffuse through a population. Communication between actors about what constitutes moral harms, etc., facilitates sanctioning immoral behaviours and reducing threats, harms, and violence to other's lives, wellbeing and property. Since moral values and norms like these make social life possible, they underlie the variety of social customs, mores and morals, in different cultures, places, and times

Neural plasticity alone should caution us against thinking that, in order to explain moral agency we must find a single brain region specifically hardwired to exclusively support a single, specialized moral function. A given brain region typically supports several functions, and any one function usually involves multiple neural regions. One must therefore expect a variety of neural regions to be involved in enabling and supporting moral intelligence. Communication, cooperation and reciprocal altruism for example each involve the multiple capabilities of the social, psychological and biological intelligences. Indeed there does not seem to be any "specifically moral part of the brain."[69] Rather, intelligent social and moral behaviour, as Casebeer and Churchland maintain, "depend on many factors, the brain's needs, …memory, future plans", perceptions, preferences, and feelings."[70] They involve coordinating "multi-modal signals …conjoined with appropriately cued executive systems …richly connected with affective and conative brain structures [that] draw upon memories", social cognition," and language, and other neurally enabled capabilities. This is moreover never a "relevance-free, value-free, skill

free business." Nor is there hard evidence that the brain is "inherently able to understand the world in moral ways ...endowing us with an intuitive sense of fairness, concern for others and observance of cultural norms."[71] The fact that moral intelligence is enabled by multiple neural processes in the social brain and is closely connected to social intelligence undermine claims that moral intelligence is innate or hardwired. On the contrary moral intelligence, as Damasio suggests, likely "requires the intervention of society" to develop, namely, in primary socialization.[72] Purely psychological virtues, finally, are likely internalizations of the social virtues, probably learnt in the socialization process.

In conclusion moral intelligence presupposes the social, biological and psychological intelligences, all of which require the rich capabilities of the social brain. Second, the purely intrapersonal psychological notions of duty, virtue, reflective thinking, logical mathematical reasoning, or individual decision making common in conventional moral theory do not suffice to constitute or explain moral intelligence. Third, moral and social intelligence enjoy an affinity, not an identity, for in addition to social intelligence moral intelligence enjoins actors, animal as well as human, to care for each other, to reciprocally exchange benefits among each other, and not to harm each other. These synergies in turn explain the wide diffusion and evolutionary successes of moral intelligence. Clearly Darwin was right. The social brain and moral intelligence are the product of evolution and natural selection. Morality is a successful evolutionary strategy.

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[24] Dubin, 99. Also see Moll J, de Oliveira-Souza R, Garrido GJ, IFAnei EB, Caparelli-Dquer EMA, Mirella LMF, Paiva F, Zahn R, Grafman J. 2007. The self as a moral actor: linking the neural correlates of social agency and moral sensitivity. *Social Neuroscience*. 2 (3-4): 336-52; Churchland PS. 2006a. *Brainwise - Studies in Neurophilosophy*. MIT: 46.

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[27] Damasio, 1994: 114.

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