The philosophical pre-history of the duplex mind

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Abstract: According to the "Duplex Mind", or dual process theory, there are two basic kinds of cognitive processes: type 1 processes operate automatically and involuntarily, operate independently of conscious processes, and are fast and effortless; whilst type 2 processes do not operate automatically, are associated with conscious awareness and control, and are comparatively slow and effortful. Such theories of human cognition are commonly held to go back to William James. This article argues that a fully-fledged dual process theory was already developed over 150 years prior to this, in the work of David Hume. Hume's innovation played a foundational role in subsequent Scottish Enlightenment work on ethical, social, political, and historical theory.

Keywords: David Hume; psychology; philosophy of mind; dual process theory; duplex mind.

The notion behind the "duplex mind", or dual process theory, is that there are, fundamentally, two kinds of cognitive[1] processes: type 1 and type 2 – also called "system 1" and "system 2". This distinction provides an account of how a cognitive phenomenon can occur in two different ways, and is used, among other things, across psychology and behavioural economics to explain a variety of phenomena, among them widespread cognitive errors and biases. As we will see below, both this distinction and its validity are being questioned on both empirical and conceptual grounds. In fact, there is no one single distinction between type 1 and type 2 processes, but for the purposes of this

[1] I here use the term "cognitive" broadly to include everything we would want to call mental, including processes of emotional and moral processing; there is thus, for instance, no opposition between the cognitive and the conative on my usage of the former term. I believe this fundamentally to be in line with how the thinkers I here discuss thought about their subject matter – albeit, obviously in different terminology – in the sense that moral judgment, on their accounts, was a process of ascertaining whether or not something like an action, motivation, habit, and so on was moral or not, and that this process of ascertaining is a process which is basically analogous to – or even of the very same kind as – a process of sense-perception. However, nothing about my use of the term here hinges on this supposition.

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article I will employ the following one. Type 1 processes are processes which (a) operate automatically and involuntarily (i.e. without conscious initiation or effort), (b) operate independently of conscious processes, and (c) are fast and effortless.[2] By some process of type x being able to "operate independently" of some process of type y I mean that x can function, and function properly, without any particular process of type y occurring. By comparison, type 2 processes do not operate automatically, are associated with conscious awareness and control, and are slower and more effortful. Recently re-developed and reinvigorated, such accounts of human psychology are widely held to go back no further than to the seminal work of William James.[3] Here I challenge this supposition by showing how a fully-fledged dual-process theory gradually developed among British moral philosophers and psychologists during the 17th and 18th Centuries, coming to full fruition in the work of David Hume. Finally, I draw into the discussion some of the criticisms levelled against dual process theory, and offer some modest suggestions about how one might begin to respond to them from a Humean point-of-view. This draws attention both to the historical and to the continued relevance of some of our often underappreciated forebears in these areas.

First of all, we must be clear about what the argument here is intended to accomplish. It is not sufficient to show that the past thinkers in question distinguished between a class of cognitive operations or processes which fulfil (a)-(c); this would, anachronistically, require us to accept distinctions between, for instance, sensory perception and reason as bona fide instances of dual process theory. Points (a)-(c) are thus necessary, but not sufficient, conditions for establishing an interesting thesis about the earlier development of dual process theory. The line of development I wish to trace does indeed spring out of a related distinction – namely, the distinction of a "moral sense" or sympathetic faculty proper from wider powers of rational deliberation – but something more is obviously needed if my thesis is to be at all interesting. It is not immediately clear precisely what more needs to be added for a fully sufficient set of conditions, but minimally we can stipulate that an interesting distinction must be one which goes beyond earlier well-known and well-worn distinctions between, for instance, perception and reason. Another addition we might propose is that the distinction between type 1 and type 2 processes must be used to provide an account of how the same kind of task – say, generating judgments

[2] This is adapted from Kahneman 2011: 20-21 and Frankish and Evans 2009. There are numerous different specific versions of dual process theory; the criteria I employ seem to me to be the most central ones.

[3] See e.g. Frankish and Evans 2009. Note that their historical overview of the pre-history of dual process theory from Plato to Freud, fails to mention *any* of the writers discussed here.

about the same kind of thing, such as the rightness or wrongness of an action, or generating beliefs about causal relations – can be, and at least sometimes is, performed in two different ways by two distinct cognitive mechanisms or processes. Whichever precise set of criteria we choose would enable us precisely to pinpoint where along the line of thinkers we will shortly discuss – from Shaftesbury, through Hutcheson, to Hume – the line is to be drawn between a mere distinction between sense-perception and rational deliberation on the one hand, and the more interesting distinction between properly type 1 and type 2 processes one the other.

Wherever such a line is drawn, however, I will demonstrate that it is clear that, by the time we reach Hume, a definite instance of dual process theory has been reached. With Hume we have a worked-out distinction between two types of cognitive processes distinguished along the lines of (a)-(c), which is not limited to distinguishing between reasoning and (external and/or internal) perception, and which is used to explain how one kind of cognitive task, namely the generation of causal judgments, can be, and in humans is, performed in two different ways by two distinct cognitive mechanisms or processes – one of type 1, the other of type 2. I will begin by discussing Shaftesbury's moral sense theory, next move on to Hutcheson's further development of that theory,[4] and then, finally, discuss how Hume takes up, and builds upon, Hutcheson's developments in a way that allows him to develop a general conception of human cognition as consisting of the aforementioned two types of cognitive processes – i.e., a fully developed conception of the duplex (human) mind – and how he describes two distinct cognitive processes, both of which generate causal judgments in humans (though not in other animals). The reason I choose to focus on Hume's account of causal judgments is that I believe this account offers a particularly clear illustration of an instance and application of Hume's dual process theory insofar as it definitely fulfils not only (a)-(c), but also clearly goes beyond any distinction between reason and perception or sensation, and provides an account of how the same kind of judgment can be, and sometimes is, reached via two distinct cognitive processes.

Shaftesbury, like Hutcheson and Hume after him, starts from the suppositions that human nature is structured in such a way to be well-adapted to humans' normal circumstances or contexts[5] and that both human nature and

[4] Although both Shaftesbury and Hutcheson conjoin concerns with ethical and aesthetic judgment, in light of my chosen focus, and for the sakes of brevity and simplicity, I will restrict my discussion to the former.

[5] I use the phrase "well-adapted" advisedly, so as to be able to include the points-of-view shared by my three protagonists. Whereas with Shaftesbury we are faced with a full-blown divinely ordained teleology, with Hume we face something much more modest. The supposition that human beings are

its context can only properly be understood (at least in part) through empirical observation. To Shaftesbury, something is good or evil to the extent that it contributes positively or negatively to a wider system – its group, species, universe, and so on – that it is part of; something is then good if and only if it is beneficial to such wider systems, and evil if and only if it is detrimental to (at least some of) them. A "sensible creature", in turn, is judged to be good or evil only when the benefit or detriment of one or more of the systems of which it is part is the object of some motivating passion or affection. In other words, the goodness of "sensible creatures" like human beings is judged by the nature of their actions' motivations: sensible creatures are good if and only if their motivations are (or generally tend to be) to the benefit some wider system; they are evil if and only if their motivations are (or tend to be) to the detriment of the some wider system (Shaftesbury 1999: 168-170). Motives, in turn, all necessarily include a passion or affection – without which no motivation occurs. Shaftesbury contrasts this with a being's virtue or merit, which is determined by the second-order evaluation that a creature makes with regard to its first-order passions or affections; this Shaftesbury calls the "moral sense" or "sense of right and wrong". These second-order passions or affections produce positive passions or affections towards those first-order passions or affections that benefit one's wider system(s), and produce negative passions or affections towards those first-order passions or affections which are detrimental to one's wider system(s). Such second-order passions or affections require reflection, a power which only humans possess, as a result of which virtue or merit is only properly ascribed to human beings (*ibid*.: 172-180). By producing second-order passions or affections, the moral sense motivates human beings to act better; it is therefore a human ability which contributes to humans' well-adaptedness to their context – i.e. to the system(s) of which they are part. Importantly, it is not at all clear that Shaftesbury's "moral sense" is a separate faculty or a sense relevantly analogous to senses such as sight, hearing, smell, touch and taste; nor is it clear how, if at all, the reflective operations of the "moral sense" are distinguished from, and related to, conscious and rational deliberation in general.

Hutcheson addresses precisely these problems. On Hutcheson's account, the "moral sense" is an inner sense that functions in the same way that external senses like sight and touch do: both, as senses, produce sensations upon encountering objects of the requisite kind; for external senses the requisite objects are external physical entities, whilst for internal senses the requisite objects are ideas. The moral sense, then, is "[t]hat Determination to be pleas'd

constituted so as generally to be well-adapted to their circumstances or contexts is weak yet substantial enough to capture an important part of what they all have in common.

with the Contemplation of these Affections, Actions, or Characters of rational Agents, which we call virtuous" (Hutcheson and Fabian 1971: vi). On Hutcheson's view, then, the moral sense, upon the contemplation or perception of virtuous affections, actions, or characters, produces a feeling of pleasure in the agent perceiving or contemplating them, and the further fact that human beings desire pleasures, and therefore the things that produce them, leads human beings to desire virtue. As a distinct faculty, Hutcheson argues that the moral sense:

> has this in common with other Senses, That however our Desire of Virtue may be counterballanc'd by Interest, our Sentiment or Perception of its Beauty cannot; as it certainly might be, if the only Ground for our Approbation were Views of Advantage (*ibid*.: 119; cf. p. 2).

Assessments of interest and advantage, here, refer to an agent's conscious and reflective assessments of what she considers to be best overall. When consciously reflecting on something in this way, the desire that we feel for virtue on account of the pleasure its perceived beauty implies may be counterbalanced by our desires for other, competing, things, such as wealth or power. In this way, our *desire* for virtue may be countered by other things we are interested in and think would be to our advantage. For example, my desire to display heroic virtues may be outweighed by the interest I have in surviving and being able to provide for my family in the future; or it may be countered by my reflection that I would better be able to serve the cause for which the war is fought by running away and fighting another day under more favourable conditions. On the other hand, our perception of the beauty of virtue, and the pleasure such beauty implies, is itself completely unaffected by whether or not our interests run counter to it. As such, the process of perception through which this perception of beauty and feeling of pleasure are generated must itself be unaffected by, and therefore independent of, conscious and reflective processes regarding our interests and advantage. In other words, although we may consciously and rationally desire something which is counter to virtue, the positive sensation produced by the moral sense's perception of something virtuous remains completely unaffected by these conscious wishes. This means that the moral sense functions independently of wider conscious and rational deliberation about what is, and what is not, advantageous or in our interests.

In addition to this, Hutcheson's moral sense, fortunately for mankind, operates automatically and involuntarily, and its functioning is fast and effortless:

> The weakness of our Reason, and […] the Infirmity and Necessitys of our Nature, are so great, that […] [t]he Author of Nature has much better furnish'd us for

a virtuous Conduct […] by almost as quick and powerful Instructions, as we have for the preservation of our Bodys: He has made Virtue a lovely Form, to excite our pursuit of it; and has given us strong Affections to be the Springs of each virtuous Action (*ibid.*: vii).

In short, Hutcheson posits a moral sense which operates on (internal) sensations or ideas to generate pleasure upon the perception of virtue. This (a) operates automatically and involuntarily, (b) functions independently of conscious processes, and (c) is fast and effortless. It is thus distinct from, and independent of, the kind of conscious and rational deliberation to which it is contrasted in all three respects. This is, Hutcheson insists, a very good thing, since such conscious and rational deliberation is so much slower and so much less perfect in its operations. We now have a clear distinction between two kinds of cognitive processes along the lines of (a)-(c), but with two remaining caveats: one, although we have both inner and outer sensual processes, we do not yet have a distinction between type 1 and type 2 processes fully separate from the traditional distinction between perception and reason; and two, we do not yet have a distinction between type 1 and type 2 processes which is explicitly employed to categorise human cognition in general. For this we must turn to Hume.

Hume uses the term *reason* in complicated and sometimes confusing ways.[6] However, it seems fair to say that he endorses a basic distinction between two kinds of *reasoning*: *demonstrative reasoning*, the making of deductive inferences concerning the relations between ideas; and *probable reasoning*, the making of inductive inferences concerning matters of fact. As Hume writes, "[a]ll reasonings may be divided into two kinds, namely, demonstrative reasoning, or that concerning relations of ideas, and moral reasoning, or that concerning matter of fact and existence" (1999: 145). Although it is controversial and not something that can properly be explored here, I will, for the purposes of this article, take it for granted that these two processes of reasoning exhaust Hume's conceptions of "reason" and "reasoning". The relation between these two kinds of reason or reasoning on the one hand, and what Hume calls the "imagination" on the other, can be spelled out in two different ways, corresponding to the two different ways in which Hume uses "imagination". Imagination is used in a broader sense in which it includes reason or reasoning of both kinds; and it is also used in a narrower sense in which reason is contrasted with the various other cognitive operations which take place within the imagination (Garrett 1997: 26-28). I shall henceforth be using "imagination" in the latter, narrower, sense.

[6] For an excellent discussion of this issue, see Owen 1999.

Hume repeatedly distinguishes between these two kinds of reasoning on the one hand, and other cognitive operations on the other. Demonstrable and probable reasoning, for Hume, are paradigmatically conscious and controlled processes; they do not operate automatically or involuntarily, do not operate independently of conscious processes, and are comparatively slow and effortful. Numerous examples of this distinction could be adduced from his writings on the emotions, on ethics, on the formation of religious convictions, and so on, but nowhere is it better illustrated than in the case of induction. Hume's twofold account of induction exemplifies both his distinction between two types of cognitive processes and how one kind of operation – that of reaching a causal judgment – can be performed in both ways.

For Hume, there are two different psychological mechanisms that generate causal judgments (see esp. Beebee 2011): (1) an associative mechanism which leads us to expect, say, a particular future event (or kind of event) upon the occasion of a present impression where that impression, in the past, has always been conjoined with the event (or kind of event) we now expect; (2) a process of conscious reasoning about causal relations through which we develop judgments and beliefs about causal links between events and, based on this, develop an expectation about the occurrence of an event (or kind of event) upon the occurrence of other events (or kind of events) which we believe to be the causes of that event (or kind of event). The former, associative mechanism operates such that "the mind, carried by habit, upon the appearance of one event, to expect its usual attendant, and to believe that it will exist" (Hume 1999: 145; see also :147). In addition to generating causal judgments, by which I mean that it generates beliefs about effects from the perception of (putatively causal) events, the associative mechanism provides the impression from which the idea of power or necessary connection derives:

> This connexion, therefore, which we *feel* in the mind, this customary transition of the imagination from one object to its usual attendant, is the sentiment or impression, from which we form the idea of power or necessary connexion. (*ibid*.: 145; 1985 sect. VI)

This is critical for Hume, since probable reasoning is founded on the idea of power or necessary connection; in fact, he goes so far as to write that on "this idea are founded all our reasonings concerning matter of fact and existence" (*ibid*.: 145; 1985: 121-122). The kinds of reasoning this refers to are processes of conscious reasoning about causal connections. Such probable reasonings are founded on the relation of cause and effect, and this is an idea that is ultimately generated by the associative mechanism which provides the impression from which it is derived. Since all our conclusions about matters of fact are derived

from probable reasoning, since this kind of reasoning is based on the idea of power or necessary connection, and since the idea of power or necessary connection is generated by operations of the associative mechanism, which does not fall under the umbrella of "reasoning", it follows, as Hume puts it, that our conclusions from experience ultimately "are *not* founded on reasoning, or any process of the understanding" (*ibid.*: 122). Probable reasoning, according to Hume, is a process which is distinct from, and which can go beyond, the associative mechanism. For instance, in the *Treatise* Hume writes that:

> When any phaenomena are constantly and invariably conjoin'd together, they acquire such a connexion in the imagination, that is passes from one to the other, without any doubt or hesitation. But below this there are many inferior degrees of evidence and probability, nor does one single contrariety of experiment entirely destroy all our reasoning. The mind ballances the contrary experiments, and deducting the inferior from the superior, proceeds with that degree of assurance or evidence, which remains. Even when these contrary experiments are entirely equal, we remove not the notion of causes and necessity; but supposing that the usual contrariety proceeds from the operation of contrary and conceal'd causes, we conclude, that the chance or indifference lies only in our judgment on account of our imperfect knowledge, not in the things themselves, which are in every case equally necessary, tho' to appearance not equally constant or certain. (1985: 451)

In other words, humans can reason about causal connections even in the absence of constant conjunction. In fact, even when contrary experiments are "entirely equal" – i.e. "if in our experience As have been followed by Bs exactly half the time – we still will (or at least *can*) formulate causal judgments" (Beebee 2011: 260).[7] This is important for our purposes, because it means that the psychological process generating causal judgments in such instances must be a different one from the operations of the associative mechanism. Furthermore, the way in which Hume writes that the mind "balances" experiments and general description in the cited passage clearly indicate that the process in question is, in contrast to the functioning of the associative mechanism, a fully conscious and voluntary one; it also seems like a slow one.

Finally, probable reasoning is clearly also a process which can operate independently of the associative mechanism. Recall that, by some process of type x being able to "operate independently" of some process of type y, I mean that x can function, and function properly, without any particular process of type y occurring. There is, then, a sense in which the process of probable reasoning is independent of the functioning of the associative mechanism, and a sense

[7] This and the below discussion of Hume's rules and their relation to the two distinct kinds pf psychological processes owes much to this article of Beebee's.

in which it is not independent of it. Probable reasoning is independent of the functioning of the associative mechanism in the sense that it can and does function to formulate causal judgments even in (some) individual instances where the associative mechanism does not function, and for (some) inputs on which the associative mechanism cannot operate. As I have just mentioned, the former can operate even in the absence of constant conjunction, where the latter cannot. This means that processes of probable reasoning, according to Hume, can take place without any *particular* process or operations of the associative mechanism taking place. On the other hand, I am *not* arguing that probable reasoning is independent of the associative mechanism in any stronger sense. For instance, it would be obviously false to assert that probable reasoning is independent of the associative mechanism in the sense that it does not rely on it in any way whatsoever. I am not, for instance, claiming that a process of probable reasoning can occur without *any* operations of the associative mechanism ever taking place, or without a fairly high threshold number of the latter type of process taking place; quite the contrary. To claim that probable reasoning and the functioning of the associative mechanism are independent in such a stronger sense would be absurd, since for Hume it is the associative mechanism that produces the idea of necessary connection, on which "are founded all our reasonings concerning matter of fact and existence" (1999: 122; 1985: 121-122). When I claim that probable reasoning, on Hume's view, can operate independently of the associative mechanism, I am not claiming that it is independent of the associative mechanism in this, or any other, stronger sense. Rather, I am only claiming that probable reasoning can occur without the occurrence of any *particular* operation of the associative mechanism. My claim that this is Hume's view rests first and foremost on the fact that he points out how processes of the former type can take place in instances in which processes of the latter type do not, and can operate on inputs which the other cannot.

My claim that probable reasoning, on Hume's account, can operate independently of the associative mechanism is further reinforced by what he writes about the rules for judging causes and effects. The fourth rule, for example, states that:

> when by any clear experiment we have discover'd the causes or effects of any phaenomenon, we immediately extend our observation to every phaenomenon of the same kind, without waiting for that constant repetition, from which the first idea of this relation is deriv'd. (1985: 223-224)

In other words, causal judgments are unproblematically made even in the absence of the constant conjunction which would be necessary for the associative mechanism to take effect. The only other alternative is a process of prob-

able reasoning which can, and at least sometimes does, operate independently of it. This is further strengthened by considering Hume's sixth rule, where he writes the following:

> The difference in the effects of two resembling objects must proceed from that particular, in which they differ. For as like causes always produce like effects, when in any instance we find our expectation to be disappointed, we must conclude that this irregularity proceeds from some difference in the causes. (1985: 224)

Put differently, if we come across a single instance where an A is not followed by a B, where previously we had always experienced a B after an A, we do not drop all our beliefs about causal connections between A and B *tout court*; instead, we postulate some other, hidden, property C which we take to be the real cause of Bs in previous As, and which was missing in the case of the latest A. Again, this is a clear case of a causal judgment being made in the absence of the operations of the associative mechanism, and again the remaining alternative is a separate process of probable reasoning which can, and sometimes does, operate independently. As Beebee puts it:

> Thus we reach a causal conclusion – that *A1*s cause *B*s, while *A2*s don't – but not solely on the basis of the associative mechanism. For as far as the associative mechanism is concerned, the *A1*s and the *A2*s are alike (they are all *A*s), and since we no longer have observed constant conjunction between *A*s and *B*s, the associative mechanism will presumably shut off so that future exposure to *A*s will, by itself, deliver no causal judgment. Hume's rules, then, provide a basic scientific method, and it is a scientific method that delivers causal judgment in the absence of the operation of the associative mechanism in the particular case under consideration. (Beebee 2011: 260)

To summarize briefly, the associative mechanism both generates causal judgments or beliefs and is the ultimate source of our idea of necessary connection – a necessary precondition for the distinct second mechanism of probable reasoning. The two mechanisms can, and do, operate independently of one another. Probable reasoning can, as we have seen, generate, and critically reflect on, matters of cause and effect even in the absence of constant conjunction, and generally independently of, and in the absence of, the operations of the associative mechanism. As I have noted, the way Hume describes probable reasoning clearly indicates that it is a voluntary and conscious process – and it seems also to give the general impression of being slow.

Just as probable reasoning can operate independently of the associative mechanism, the associative mechanism functions in the absence of any reasoning capacities, probable or otherwise. As such, the associative mechanism, unlike probable reasoning, functions independently of "all the laboured deductions

of the understanding" (Hume 1999: 130). It belongs to that "species of natural instincts, which no reasoning or prosess of thought and understanding is able, either to produce, or to prevent" (123-124). Consequently, the associative mechanism, again in contrast to probable reasoning, operates fast, effortlessly and reliably across the animal world; including in children and mentally disabled people, whose reasoning capacities are less developed, and among animals who lack reason altogether.[8] As with Hutcheson, it is an eminently good thing that the "wisdom of nature" has not left this vital function to the unreliable and imperfect processes of conscious reasoning, but instead left it to an "instinct mechanical tendency" (Hume 1999: 130). Note that this renders the associative mechanism independent of probable reasoning not only in the weaker sense in which the former may be said to be able to operate independently of the latter; but also in the stronger sense of associative mechanism being able to function, and function properly, without any process of reasoning, probable or otherwise, ever taking place – as Hume believes that it does in, for instance, animals.

Thus, we have seen that Hume's associative mechanism (a) operates automatically and involuntarily, (b) operates independently of conscious processes, and (c) is fast and effortless in the way if generates causal judgments. By contrast, probable reasoning also generates causal judgments, but is conscious, and therefore does not operate automatically or involuntarily, it clearly does not operate independently of conscious processes, and it is comparatively slow and effortful. In developing a distinction between two fundamental kinds of psychological processes distinguished according to (a)-(c), it is clear that Hume goes far beyond any mere distinction between senses and reasoning. Furthermore, these two distinct and independent processes perform the same task in that they both generate causal judgments, and they can yield different results – as when probable reasoning generates a causal hypothesis in the absence of an observed constant conjunction. Having done this, it is clear that Hume successfully developed a fully-fledged conception of dual process theory, or of the duplex mind, far earlier than has been recognised.

Finally, we may want to ask the question: is any of this relevant to any part of the current debate about dual process theories? I will suggest that Hume's thought at least merits attention in this regard, by considering how it might respond to two objections that have been levelled against contemporary dual process theories.[9] The first objection I will look at is Frankish's argument that a strict division between two systems is evolutionarily implausible (Frankish

[8] See Hume, 1985: 226-228; Hume 1999: 129-130 and 165-168

[9] I would like to thank an anonymous referee from *Philosophical Inquiries* for the suggestion that I do this.

2009). Roughly, he argues that it is more plausible to suppose that, rather than evolve a new and different system (system 2) on top of the pre-existing on (system 1), it is much more plausible to suppose that the cognitive processes identified as type-2 (or system 2) processes evolved by way of the assembly of independently evolved type-1 components. They are thus unlikely to be two entirely different systems, but instead two distinct levels of cognitive processes, one of which (i.e. type 2 processes) is critically dependent on the other (namely type 1 processes) (i) for providing them with inputs, (ii) causally, in the sense that type 2 processes are ultimately generated by type 1 cognitive processes, (iii) instrumentally, in that type 2 processes can make use of type 1 processes for instrumental purposes, and (iv) type 2 processes will typically be dependent on type 1 processes for making them effective, since any process of mediation between an output of a type 2 process, e.g. a consciously reached decision to buy sweets, will involve type 1 processes in carrying it out, e.g. using ones visual system in walking to the shop without being unexpectedly hit by a bus.

Evolution and neurology aside, I think Hume's view fits this picture very well; in fact, he makes a point of some of the very same dependence-relations between type 2 and type 1 processes. For one, on Hume's view the associative mechanism, a type 1 process, provides the impression from which our idea of power or necessary connection derives. As such, this type 1 process itself generates a necessary condition for the possibility, and for the possibility of the development, of inductive causal reasoning, a type 2 process. As he writes, on "this idea are founded all our reasonings concerning matter of fact and existence" (Hume 1999: 145; 1985: 121-122). Causal reasoning is therefore critically dependant on the operations of the associative mechanism, but not vice versa. As his comparisons with animals make clear, the associative mechanism is able to function in the absence of any and all forms of reasoning, inductive or deductive. In addition to this, of course, the associative mechanism also continuously generates causal judgments which feature saliently throughout human deliberation and decision-making, providing such cognitive processes with important inputs. This is not to say that the two processes operate entirely independently in the stronger sense that I have rejected above (although they do so in the weaker sense I have defended). For instance, inductive reasoning about causal relations can take place, as we have seen, even in the absence of the associative mechanism, and conscious thinking at least has the power to ignore causal judgments made by the associative mechanism, if not its operations. Finally, I should also point out that there is nothing in Hume's work that requires there to be two entirely different systems in the human mind. All I have argued is that Hume draws a distinction between two kinds of processes that mirrors the contemporary distinction between type 1 and type 2 cognitive

processes. This need not commit him either to the view that these represent entirely different systems or to the view that they are only two distinct levels of cognitive processes.

The second argument I will consider is Carruthers' contention that even if we accept both a distinction between intuitive and reflective processes (Carruthers 2014) and Frankish's hypothesis that reflective processes are critically dependent on lower-level intuitive processes, the system 1/system 2 distinction is still dubious, since that distinction fails to map onto the distinction between intuitive and reflective processes. On the one hand, reflective reasoning can employ simple heuristics to operate fast, a trademark of system 1 processes; on the other hand, some intuitive systems can be slow and controlled, trademarks of system 2 processes, and in fact sometimes reflective processes lead to worse outcomes than intuitive ones.[10]

I'll begin with the last point. Both Hume and Hutcheson agree that leaving the general source of certain judgments up to intuitive or system 1 processes rather than to the alternative is a very good thing. Hutcheson stresses the "weakness of our Reason, and (…) the Infirmity and Necessitys of our Nature", approving of how the "Author of Nature has much better furnish'd us for a virtuous Conduct" by leaving such judgments up to the moral sense rather than to conscious reasoning (Hutcheson 1971: vii). Similarly, Hume talks about how good it is that the "wisdom of nature" has not left the process of forming causal judgments up to the unreliable and imperfect processes of conscious reasoning, but instead to an "instinct mechanical tendency" (1999: 30). In short, Hume, like Hutcheson before him with respect to the moral sense, emphasises that the highly imperfect and unreliable processes of conscious reasoning would do an inferior job of securing the necessary causal judgments that human and other animals need to function well, as a result of which it is a very good thing that this responsibility generally rests with the associative mechanism instead. One can make the argument here, as in many other cases, that the most rational thing to do would be to have a system operating by simple heuristics to take care of such essential tasks. Thus, it is is entirely rational in at least one important sense, on Hume's view, that causal judgments are generally made by the type 1 process of the associative mechanism, namely in the sense that the means are well-suited to their ends in light of context.[11]

[10] Carruthers also discusses the issue of the normative standards achievable by type 1 processes. I leave this issue aside here since it's not part of most explicit distinctions between type 1 and 2 processes, including the one used here.

[11] There are of course many other senses in which the operations of the associative mechanism, when compared to deductive or inductive reasoning, is not rational, but these are obvious and need not concern us here.

Hume can also respond to at least some of Carruthers' main argument. For instance, there is no reason, from a Humean point-of-view, why e.g. a conscious process of reaching causal judgments cannot adopt a simple rule-governed heuristic in order to operate fast without threatening the distinction he is drawing. In the case of reaching causal judgments, this can be accounted for in terms of a conscious reasoning process deliberately adopting a simple rule-following procedure in order to speed up its reaching of causal judgments. Assuming that this indeed manages to be successful, we would now have another process through which we reach causal judgments, namely by consciously following a specific rule or heuristic. However, at no point does this challenge the distinction between the two kinds of processes for reaching causal judgments that Hume distinguishes. It would still be the case that there were two distinct processes for reaching causal judgments – inductive reasoning and the associative mechanism – which differed with respect to (a)-(c), and that these are the two main processes through which human beings generally make causal judgments. In other words, the fact that humans can consciously adopt simple heuristics in order to reach e.g. a judgment fast may well demand a complication (one which arguably may already be implied in Frankish), but it does not, in and of itself, undermine the distinction drawn between two distinct kinds of processes in the way that Hume draws it to begin with. As for Carruthers' insistence that intuitive processes can sometimes be slow, it's not clear to me that the examples he mentions – falling in love and "sleeping on it" – are sufficiently well developed to support his argument. Recall that the contrast between type 1 and 2 processes in terms of speed is a relative one, where one is fast relative to the other. In the case of falling in love, there is no relevant type 2 process or outcome to compare it with, since falling in love with someone is never the outcome of a conscious or reflective process.[12] It is also not clear that "sleeping on" something really can be considered slow relative to to a conscious or reflective process of attempting to reach e.g. a difficult decision. Although it's not clear to me how we might, on Hume's behalf, answer this last component of Carruthers' argument, I don't think we have to, since the evidence adduced in its favour fails to lend much support the conclusion.

The real significance of the development I have sketched here should not be underestimated. Much of what was most unique and significant about subsequent Scottish Enlightenment thought is heavily indebted to the far richer and more complex conception of human cognition that Hume's work opened up. In breaking up a unitary and rationalistic conception of human cogni-

[12] Of course, realising or admitting that we've fallen in love with someone can be, but that's a different thing altogether.

tion into a multitude of different processes – some conscious, controlled, and rational, others less so – it became possible to think about the wide variety of ways in which different natural, social, and cultural environments influence the nature and development of human beings. We see the influence of this way of thinking not just in Hume's own magisterial historical works, but also in the work many others, such as in the complex moral psychology and sociology of Adam Smith's Theory of Moral Sentiments, in the four stage theories of history developed by Smith and re-worked by a generation of other thinkers, in Adam Ferguson's complex analyses of the relations between economy and polity, and more widely throughout the social and political theory of the Scottish Enlightenment which Hume so influenced. This movement, in turn, has deeply affected our modern world both directly and through the wide range of other thinkers it inspired in various ways; for instance, through Kant's metaphysics and epistemology (initially penned as a rationalist reply to Hume's), and through the historical and political theories of Hegel and Marx. Like its modern re-development, Hume's conception of dual process theory was developed in response to a unitary rationalistic conception of human psychology. Ultimately, they both seek, contra the overly simplistic views they respond to and reject, to do justice to the full range of human cognition – with all of its inherent strengths and weaknesses. It is high time we recognised the significance of Hume's contribution in this regard.

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