

## Science and Sympathy: “Intuition” and the Ethics of Human Judgment

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Despite advances in our understanding of human judgment, there is still much work to be done to clarify how decision makers make wise or ethical judgments. In this article, a case is made that an understanding of wise judgment would require a theory of wisdom, and that wisdom and wise judgment entail integrated cognition. It will not do to define thinking in terms of two isolable systems. This is because thinking is quasi-rational, and involves a multidimensional array of variables whose values range continuously from relatively more rational at one end to relatively more experiential at the other. Dual-system models may be useful for defining the poles of the multidimensional cognitive continuum, but there is more to wise judgment than thinking fast or slow. The proposed approach is novel, because it provides a framework by which to examine empirically the ways in which rational and experiential elements of thinking can be integrated, and judgments can be calibrated appropriately to the task at hand.

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Decision makers whose judgments have the potential to cause harm have an obligation to exercise wise judgment. It is thus crucial that experts in judgment and decision making have something valuable to offer as guidance to those who strive to make wise judgments. Yet, after almost a half century of social science research on judgment and decision making, much still remains to be learned about how decision makers achieve wise judgments (Hammond, 2010). The main contention of this paper is that an improved understanding of wisdom in judgment requires

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a theory of integrated cognition, and that such a theory may differ from popular dual-system theories of human cognition (Keren and Schul, 2009).

The core concern is the philosophical question of whether there is something morally irresponsible or disingenuous about believing an assertion for which there is, or could be, no evidential support. Following James (1912), it will first be shown that it is neither desirable nor possible to omit from consideration unjustifiable aspects of judgment, and that wise judgment requires an ability to assume an attitude by which a decision maker becomes absorbed to a greater or lesser degree in the experience of those who may be affected by the consequences of judgment. Second, this attitude cannot stand alone, because there is nothing in it to prevent a decision maker from causing harm to others when the decision maker fails to apply relevant objective forms of knowing. Scientific thinking and an ability to lose oneself in the experience of another must be integrated in wise judgment. Third, the question of how decision researchers can contribute to an improved understanding of wise judgment will be addressed by examining theories of wisdom as integrated cognition (Bruner, 1986; Labouvie-Vief, 1990). Finally, Epstein's cognitive-experiential-self theory (Epstein, 2008; Epstein, Lipson, Holstein, and Huh, 1992) will be recommended as a basis for a better understanding of wisdom in judgment, but only if reinterpreted in terms of a single-system, rather than dual-system account of judgment (Hammond, 1996, 2010). A more fruitful approach to wise judgment may require abandoning the popular view that rational and experiential forms of knowing constitute opposing systems of thought.

### *The Moral Dimension of Judgment: Pascal's Wager and Clifford's Dictum*

Pascal was an advocate of the complementarity of evidence and normative belief. In defense of belief, he formulated what is now famously called Pascal's Wager, whereby he argued that an analysis of risks and benefits of outcomes would show that one is justified in living as if God existed, even if one is not a true believer (Pascal, 1669/1958, Section IV, pp. 52–71). His argument was as follows. God either exists or He does not exist, and reason would be of no use in determining which the case is. A game is being played for which one has no choice but to place a wager, for withholding a wager is in effect to have already made a choice. For Pascal, himself a devote Christian, the reasonable choice seemed obvious, since wagering for the existence of God would lead either to an infinitely happy life or a finite loss, whereas wagering against God could lead to eternal damnation or a finite gain. If this is how it is, then certainly it would be prudent to heed Pascal's advice, and to wager in favor of the existence of God, for there would be everything to gain and little to lose. This reasoning is reminiscent of, and a precursor to, modern decision theory, which if the terms of Pascal's argument were assumed to be true, would also conclude that a belief in God is the only rational decision.

The point is not so much whether Pascal's argument is valid, or even whether it is convincing. Rather, it is that Pascal's main goal was to persuade us that it was not irrational to believe or to continue to believe an assertion that lacks evidential support. But, consider a person who, though persuaded by Pascal's argument, cannot come to believe in God. Perhaps it would be deceitful for this person to wager on God's existence. God would surely see through this shallow ploy. Pascal anticipated this counterargument by claiming that an inability to believe would itself be irrational, given the wager. In fact, he suggested a form of behavior modification: that acting as if one believed in God would "naturally make you believe, and deaden your acuteness" (Pascal, 1669/1958, paragraph 233, p. 68). In this way, acting in accordance with Pascal's Wager would presumably cure the skeptic's unfaithfulness.

It might be helpful to refashion Pascal's Wager in the context of modern hypothesis testing. Standard hypothesis testing begins with the assumption that the null hypothesis is true, and then proceeds to reject the null hypothesis only if there is sufficient falsifying evidence. In our modern version of Pascal's Wager, one would first assume that God does not exist, and then reject this hypothesis only if there is sufficient evidence to the contrary. But it is unclear how to test this hypothesis, or what would constitute sufficient evidence to falsify the nonexistence of God. From the modern perspective, it seems that the apparent plausibility of Pascal's argument might have derived at least in part from the fact that Pascal had already assumed the Christian worldview to be true: that either there is a single Christian God or there is no God at all. Pascal's reasoning rests on prior assumptions about the relationship between reward and obedience to God, and punishment and skepticism. For this reason, Pascal's Wager might seem more plausible to the extent that one harbors these implicit associations. Perhaps Pascal inserted his conception of God into the assumptions of the Wager. It is possible, of course, that Pascal set out deliberately to coerce his readers into believing in a jealous, angry God by appealing to self-interest and fear of the unknown. Nevertheless, it is at least as plausible that Pascal's intentions were as pure as his convictions.

Pascal's motivations were grounded in religious and moral considerations. But, it is also the case that objections to Pascal's Wager were likewise infused with religious and moral concerns. In one such objection, Clifford (1876–1877) related the tale of a ship owner who chose to ignore good evidence that his ship was unsafe:

A shipowner was about to send to sea an emigrant-ship. He knew that she was old, and not overwell built at the first; that she had seen many seas and climes, and often had needed repairs. Doubts had been suggested to him that possibly she was not seaworthy. These doubts preyed upon his mind, and made him unhappy; he thought that perhaps he ought to have her thoroughly overhauled and refitted, even though this should put him at great expense. Before the ship sailed, however, he succeeded in overcoming these melancholy reflections. He said to himself that she had gone safely through so many voyages and weathered so many storms that it was idle to suppose

she would not come safely home from this trip also. He would put his trust in Providence, which could hardly fail to protect all these unhappy families that were leaving their fatherland to seek for better times elsewhere. He would dismiss from his mind all ungenerous suspicions about the honesty of builders and contractors. In such ways he acquired a sincere and comfortable conviction that his vessel was thoroughly safe and seaworthy; he watched her departure with a light heart, and benevolent wishes for the success of the exiles in their strange new home that was to be; and he got his insurance-money when she went down in mid-ocean and told no tales. (p. 1)

Obviously, the ship owner should be held accountable for the deaths of the ship's passengers because he ignored evidence relevant to assessing the seaworthiness of his ship. However, it is an open question as to how far this example can be generalized. Clifford himself came to the stark conclusion that it is "wrong everywhere, always, and for anyone, to believe anything upon insufficient evidence" (p. 5). Clifford's Dictum, as this statement has come to be called, would therefore extend to moral decisions in which values conflict, and to Pascal's faith in God, for which of course there could be no evidence of the kind Clifford had in mind.

James (1912) objected to Clifford's Dictum on grounds that in cases of religious belief and morality, it may be acceptable to decide despite insufficient evidence (pp. 8–21). Clifford's Dictum is essentially a maximizing strategy that if applied thoroughly would nullify virtually any type of error that could come from making unjustifiable judgments, but as James pointed out, this strategy might not be helpful for moral or religious decisions. Indeed, even for ordinary decisions, we sometimes have no choice but to decide, and we are sometimes forced to make judgments that are consequential and meaningful on the basis of information that includes elements that are less than fully justifiable. James argued that moral and religious decisions are often forced and highly consequential for many people, and to ask them to suspend judgment in these cases just because there is no sufficient evidence, would no doubt put an end to much of what they hold dear.

Yet, neither James nor Pascal would have suggested that denying or willfully ignoring relevant available evidence could ever be justified, especially if doing so could result in harming others. Perhaps Clifford's parable of the ship owner betrays a category mistake. That is, maybe it was an epistemological tale about the dangers of drawing conclusions based on unsupported beliefs — a methodological point — rather than a point about moral reasoning, *per se*. Although it is easy to see why one might argue this point, doing so would miss the meaning of the parable. Clifford's parable appeals to more than just the need for sound methodology: it also appeals to ethical needs for sympathy for those who could potentially be harmed by one's judgments, and for a firm commitment to do no harm. The effectiveness of Clifford's parable therefore lies in the ship owner's selfishness, not merely in his believing something on the basis of insufficient evidence, and in his inability to fully consider the consequences for those whom his judgment might affect.

If the ship owner's actions were the result of self-interest, that is, if he deliberately chose to ignore signs that his ship was compromised, then clearly he would be culpable for the deaths of the ship's passengers. In *Book III, Part I* of the *Nicomachean Ethics*, Aristotle framed culpable choice in terms of voluntary behavior:

Now every wicked man is ignorant of what he ought to do and what he ought to abstain from, and it is by reason of error of this kind that men become unjust and in general bad; but the term "involuntary" tends to be used not if a man is ignorant of what is to his advantage — for it is not mistaken purpose that causes involuntary action (it leads rather to wickedness), nor ignorance of the universal (for that men are blamed), but ignorance of particulars, i.e. of the circumstances of the action and the objects with which it is concerned. For it is on these that both pity and pardon depend, since the person who is ignorant of any of these acts involuntarily.

Following Aristotle, allowing the crippled ship to sail would constitute a voluntary choice that was performed in ignorance, and not just by reason of ignorance. The ship owner did not act involuntarily by reason of ignorance, an act for which he might be excused. Rather, he acted in ignorance: he was ignorant of what he ought to have done, acted out of mistaken purpose, and would thereby be culpable for the deaths of his clients (also see Aristotle, Book V, Part VIII). For Kant (1793/1999) as well, the ship owner committed an evil act, for he acted deliberately, and out of selfishness, with little concern for the human consequences of his judgment.

Clifford's parable is compelling, not simply because the ship owner overlooked data, but because he did so out of selfishness and lack of sympathy. It will be interesting, therefore, to consider the case of an individual who has sympathy for those who he or she is responsible for, but still chooses to ignore evidence on other grounds.

### *The Moral Obligation to be Intelligent*

More recently, Banaji (2008) expressed a sentiment reminiscent of Clifford's Dictum: "Do we have a moral obligation to be intelligent?" Banaji begins by quoting Erskine, who wrote:

If a wise man should ask, What are the modern virtues? and should answer his own question . . . what virtues would he name? . . . When the wise man brings his list of our genuine admirations, will intelligence be one of them? We might seem to be well within the old ideal of modesty if we claimed the virtue of intelligence. But before we claim the virtue, are we convinced that it is a virtue, not a peril? (p. xxi)

Erskine was criticized during his time for his view that a resolve to be as intelligent as we can should be included as a virtue. To some extent, these criticisms derived from the fact that one can use intelligence for good or for evil. However, by "intelligence,"

Erskine meant a “broad set of competencies, skills, and knowledge” (p. xxi), instead of a general mental faculty. Erskine’s point was that we are obligated to prevent harming other people by striving to prevent acting in ignorance when doing so could have been avoided by due diligence. Erskine’s reference to “the old ideal of modesty” might suggest that the notion of intelligence as a virtue is somewhat misplaced. Perhaps his argument is better interpreted as an appeal to wisdom, specifically to the virtue of epistemic humility: the ability and willingness to accurately assess the claims and recommendations one wishes to make in terms of the quality of evidence that is available for those claims.

Erskine later clarified his position as follows: [To] be as intelligent as we can is a moral obligation — that intelligence is one of the talents for the use of which we should be called to account — that if we haven’t exhausted every effort to know whether what we are doing is right, it will be no excuse to say that we meant well. (*italics in the original*, p. xviii)

For Erskine, it was not sufficient merely to have good intentions. Having a sincere and comfortable conviction, to borrow from Clifford’s parable, cannot insulate decision makers from culpability if they cause harm, and this is true even if they are committed to doing good. Acting out of the goodness of one’s heart cannot absolve decision makers from responsibility if harm caused by their judgments could have been avoided.

The plea for epistemic humility in judgment is as pertinent today as it was in Erskine’s time. As Banaji pointed out, well-meaning people continue to separate intelligence and goodness, and often put a higher value on goodness. The expectation is that decision makers, such as judges, lawyers, jurors, and prosecutors, should be as pure of heart as possible, but it is a different question as to whether a decision maker is fit to judge. Banaji (2008) argued that:

As the science of the mind has grown, any simple separation of intelligence and goodness has become untenable, as has the privileging of either. More so than ever, to be good requires intelligence about matters that our predecessors, even those here just yesterday, not only did not know, but could not know. (p. xviii)

Social science has produced results that challenge traditional theory and practice with respect to psychology, and to ignore these results on grounds that they are unappealing, or contrary to theory or “common sense,” is to risk avoidable injustice.

Many cases of avoidable injustice come to mind, such as those involving recipients of poor judgment in applications of recovered memory therapy, whereby harm was caused by lack of knowledge of, or misunderstandings about, the reconstructive nature of memory processes; the facilitated communication debacle in the 1990s, which involved unconscious behavior and false allegations of sexual abuse; “Scared Straight” programs, which have been shown to have a tendency to

backfire and increase the odds of offending; and critical incident stress debriefing, which can increase post-traumatic stress symptoms in some people rather than decrease them (Lilienfeld, 2007). No matter how intuitively appealing, these and other approaches to care may be not only empirically, but also morally, unjustifiable. The neglect of important social science results in public policy debates is also relevant here, such as policy makers' neglect of research that links media violence and aggression (Anderson and Gentile, 2008), and judicial neglect of reliable research suggesting death-qualified jurors tend to be biased toward the prosecution (Cowan, Thompson, and Ellsworth, 1984; Thompson, Cowan, Ellsworth, and Harrington, 1984).

Clifford's Dictum — that it is wrong everywhere, always, and for anyone, to believe anything upon insufficient evidence — is too unforgiving as it stands. But, it is not unreasonable to claim that in matters where judgments have a potential to cause harm, decision makers are culpable for harm, regardless of their good intentions or their ignorance. It is not that decision makers should privilege intelligence over goodness. Rather, the point is that it is no longer tenable to separate what is intelligent from what is good. Midgley (1978) put the point succinctly:

[As] a minute's thought would show, science and sympathy cannot be alternatives, much less opponents. Anyone who treats them as such has forgotten the point of both. They are distinct aspects of life and we need them both. (p. 122)

Wise judgment requires that science and sympathy be considered as complementary rather than opposing modes of knowing. If the defining characteristic of wise judgment is epistemic humility, then social scientists might expect decision makers to ask for guidance about how to achieve this virtue, and the scientists ought to have something of value to offer. This would require a theory of wisdom and wise judgment as integrated cognition.

### *Wisdom as Integrated Cognition*

Disagreement between proponents of analysis or intuition is ubiquitous and is often characterized by heartfelt advocacy for one mode over and against the other. Berlin (1978, p. 78) addressed this age-old rivalry as existing between those who believe that knowledge “results from methodological inquiry” and others who seek knowledge of a “more impalpable kind that consists in the ‘sense of reality,’ in ‘wisdom.’” Berlin used colorful language to characterize advocates of analysis as “ambitious champions of science,” who are prone to “making absurd claims, promising the impossible, issuing false prospectuses . . . and all this because they will not, being vain and headstrong, admit that too many factors in too many situations are always unknown, and not discoverable by the methods of natural science.” In turn, proponents of intuition have been accused of “irrationalism and obscurantism” and of

being driven by “the emotions of blind prejudice” to “deliberately reject . . . reliable public standards of ascertainable truth.” Although decision makers may identify ideologically with one or the other side of this debate, in practice, actual judgment tasks rarely require single-minded devotion to either point of view.

Of course, Berlin was speaking for thinkers such as Pascal and Rousseau who defended, as Berlin (1978) put it, “the reasons of the heart, or of men’s moral and spiritual nature, of sublimity and depth, of the ‘profounder’ insights of poets and prophets, of special kinds of understanding, of inwardly comprehending, or being at one with, the world” (p. 79). Perhaps then, the appeal of rationalism or romanticism is due to differences between those who favor the head versus those who favor the heart. Indeed, James (1907, p. 12) believed that the tenacity of this and similar disputes can be traced to the tough- or tender-mindedness of the thinker. But, even if James was right about this, there would still be a need for continued dialog, because practical and moral considerations require that judgments not be characterized by ready-made adherence to one or another side of the rivalry between science and sympathy (Midgley, 1978, p. 122). What is needed is a theory of wisdom to guide us toward a better understanding of how these different styles of knowing might be integrated.

Labouvie-Vief (1990) argued that Western psychologists have typically characterized cognitive and intellectual functions and their development in terms of “outer, objective, and logical” forms of processing and have contrasted these with “inner, subjective, and organismic” forms of knowing (p. 52). Moreover, she claimed that most theories of cognition have assumed the primacy of objective forms of knowing, and thus have presented an incomplete or perhaps even distorted view of cognitive functioning. She maintained that a more adequate approach to cognition would be founded on the concept of “two modes of knowing that, although often in competition, ideally function in a dialogic relationship” (p. 52). Wisdom, according to Labouvie-Vief, is a “smooth and relatively balanced dialog” between these two modes of knowing (p. 53). In this sense, Labouvie-Vief argues, wisdom is integrated cognition.

Labouvie-Vief (1990) drew a useful distinction between *logos* and *mythos*. She explained that “*logos*” like “*mythos*” means “word,” and more specifically, to “gather” or “read,” and that it connotes “counting, reckoning, explanation, rule, or principle and, finally, reason” (p. 56). Thus, *logos* may be taken to denote knowledge “that is arguable and can be demonstrated and defined with precision and agreement” (p. 56). In contrast, Labouvie-Vief maintained that “*mythos*” means “speech, narrative, plot, or dialog,” and so denotes a holistic mode of knowing in which meaning is founded on a “bond of close identification between the self and the object of thought” (p. 55). Labouvie-Vief emphasized that *mythos* is not to be taken as an immature or degraded version of *logos*; nor is it a romantic alternative to the rationalist tradition. *Logos* and *mythos* play equally important and integral roles in cognitive processing as irreducible and complementary modes of knowing.



Labouvie-Vief's distinction between *logos* and *mythos* is very similar to Bruner's (1986) distinction between the logico-scientific or paradigmatic mode and the narrative mode of thought (pp. 11–43). According to Bruner, the scientific method is an idealization of the logico-scientific mode, which involves categorization, classification, logic, and formal mathematical operations. This mode aims to establish and maintain consistency and non-contradiction, and to discover general laws that transcend particular contexts. In contrast, Bruner argues that the narrative mode includes the type of thinking that is involved when a reader finds meaning in a narrative, but it comprises more than this. The narrative mode aims for verisimilitude — the appearance of truth, or lifelikeness — or as Ricoeur (1977) insisted, narrative aims for “tensive” truth, which does not simply mirror the world, but promotes a fresh relationship between knower and known. As such, the narrative mode is the means by which individual experience is endowed with meaning. These modes of knowing are irreducible in the sense that they have distinctive ways of ordering experience, different operating principles, and different criteria for what counts as well-formed.

There are similarities and differences between a well-formed logical argument and a convincing narrative. Both arguments and stories may involve simple exposition in the sense that both convert statements of fact into statements with causal implications. However, the type of causality that is involved in arguments and stories is not the same. The “if-then” logic of a formal argument differs from the first-this-happened-and-then-this-happened structure of a narrative, and the ensuing search for connections between events. Whereas a logical argument aims to establish conditions of universal truth, narratives have the power to blend “timeless miracles into the particulars of experience” and to “locate the experience in time and space” (Bruner, 1986, p. 13). The conclusion of a valid logical argument follows of necessity from its premises, regardless of whether the outcome is believable. In contrast, a narrative works when it connects with emotions and the particulars of experience. Narratives may be logical, but they may also violate logic for effect. Narratives can be true, of course, but the goodness of a narrative depends on how it captures attention and engages the emotions. For this reason, a well-formed narrative can be far more persuasive than a logical argument.

The rules of valid logical argument are explicit and well-known, whereas the criteria for a narrative may be less so. Bruner attempted to establish some of these criteria. Bruner (1986) argued that “narrative deals with the vicissitudes of human intention” (p. 16). The primitive and immediately recognizable nature of human intention contributes to the appeal of a narrative. Countless narratives feature characters who, due to misplaced intentions, find themselves in some quandary for which they have varying degrees of awareness. Bruner further pointed out that fictional discourse induces a reader to participate not only in comprehending a text, but also in producing it: “the great writer’s gift to a reader is to make him a better writer” (p. 37). Yet, the meaning of a text is not arbitrary.

Language guides the reader, even if it also enlists the reader's imagination and triggers affect in an indeterminate way. The narrative style of thinking deals in implicit meanings that invite alternative possibilities for interpretation. All of this contrasts with the paradigmatic style, for which the goal is explicit, determinate meanings.

Bruner (1986) identified three types of implicit meanings: presupposition, subjectification, and multiple perspective. First, presupposition "is an implied proposition whose force remains invariant whether the explicit proposition in which it is embedded is true or false" (p. 27). The opening line of "Clay" (Joyce, 1914/2001) — "The matron had given her leave to go out as soon as the women's tea was over and Maria looked forward to her evening out" — presupposes a large amount of implicit background knowledge about personality and social roles, which permeates this line with meaning. Second, the use of subjectification makes irrelevant the goal of depicting a world independent of experience. Subjectification holds meaning open by making it possible for the reader to identify subjectively with the characters. Where the paradigmatic mode aims for an explicit, timeless, omniscient conception of reality, the narrative mode is intimately tied to the perspectives of a narrative's protagonists. Third, Bruner (1986) emphasized that authors employ multiple perspectives by filtering reality through the limited perspectives of many characters, like "a set of prisms" (p. 26) that contributes to the lifelikeness or believability of the narrative. In contrast, a goal of the logico-scientific mode is to reduce all individual perspectives to one, more fundamental, perspective.

The narrative mode, or *mythos*, is grounded in a close identification between the self and the object of thought. The characters in a narrative are not differentiated from the motives and intentions of the reader. Much depends on presuppositions the reader brings to a narrative, her ability to filter reality through the consciousness of the narrative's characters, and to be absorbed in the narrative as it unfolds from the standpoint of multiple, limited perspectives. The meaning of a narrative thus derives from the unitary bond between knower and known. The sense of being absorbed in a narrative, captivated by it such that the world outside the narrative fades into the background, is the mark of narrative-mode thinking. This style of thought contrasts markedly with that of the logico-scientific mode, or *logos*, for which, ideally, meaning is detached from present, immediate experience, and partitioned into fixed categories. Ultimately, the goal of *logos* is to codify knowledge into a mechanical, computable, deductively certain form.

It may be tempting to construe *logos* and *mythos* as two isolable systems of thought that are in competition with each other. But, this would be too reductionistic from the perspective under consideration. Instead, Labouvie-Vief (1990) suggested that *logos* and *mythos* are best understood as "irreducible and complementary poles" (p. 56) of a continuum of cognition that runs from *logos* at one pole to *mythos* at the other. This proposed reconceptualization requires

a major transformation in conventional ways of thinking about rational and intuitive thought. For example, it will not do to say that wisdom requires just the right mix of *logos* and *mythos*. If thought lies on a continuum that runs from pure *logos* at one end to pure *mythos* at the other, then there are not two isolable systems to blend. However, just as it is reasonable to state that the colors black (i.e., #000000) and white (i.e., #FFFFFF) are endpoints for countless shades of gray (e.g., #202020, #C0C0C0, #888888, and so on) or indeed colors of the rainbow, it should be possible to talk in precise terms about quasi-rational cognition: the nuanced forms of thought that lie on a continuum from *logos* to *mythos*. On this view, quasi-rationality would replace the distinction between analysis and intuition, and would encourage speculation about a single, multidimensional, integrated system of cognition.

### *Toward a Theory of Integrated Cognition*

Researchers often conceptualize analysis and intuition as products of two qualitatively different mental systems (Epstein et al., 1992; Evans, 2003, 2006, 2008; Kahneman, 2011; Kahneman and Frederick, 2002; Loewenstein and O'Donoghue, 2004; Sloman, 1996; Stanovich and West, 2000; Strack and Deutch, 2004). Although there appears to be some consensus that a dual-system approach is necessary, it is a matter of debate as to whether or to what extent dual-system theories are consistent with each other (Gigerenzer and Regier, 1996; Newstead, 2000). For example, Sloman's (1996) distinction between rule-based and associative processes applies only to the cognitive domain, whereas Loewenstein and O'Donoghue's (2004) model centers on the traditional distinction between rational and affective processes. In addition, different theorists employ different terms to label their models, and they use different definitions of key terms even where similar terms are used to label the defining aspects of the systems. Moreover, Keren and Schul (2009) point out that nearly all dual-system theorists employ the terms "system," "process," and "mode" interchangeably. Kahneman and Frederick (2002) thus adopted the neutral labels System 1 and System 2 from Stanovich and West (2000), to differentiate broadly between fast, experiential, associative, affective processing, and slow, rational, rule-based, deliberative, noetic processing. The System 1/System 2 distinction may be satisfying as a classification system, but is perhaps less satisfactory as a theory of judgment.

Epstein et al.'s (1992; Epstein, 2008) cognitive-experiential-self theory (CEST) is the most inclusive of the dual-system models, because it integrates the most common dualities found in this family of models, while also grounding these dualities in CEST. Epstein (2008) argued that rational thought originates from a rational system, and that intuitive thought originates from an experiential system. He defined these systems in terms of 16 binary dimensions. For instance, the rational system is conscious; the experiential system is preconscious. The rational system

is deliberative; the experiential system is automatic, and so on (p. 26). Epstein assumed that the two systems operate in parallel and are bi-directionally interactive. He described the interaction between these systems as a “dance” in which each system reacts to the responses made by the other system, or the output of both systems is the result of a compromise (p. 27). For Epstein, intuition is a subset of experiential processing that can be characterized as “the accumulated tacit information that a person has acquired by automatically learning from experience,” and involves “knowing without knowing how one knows” (p. 29). Therefore, formal superstitions and religious beliefs, though experiential, would not qualify as intuitive on Epstein’s account, because superstitions and religious beliefs violate the requirement that an intuitive belief must be tacit. Like other dual system theories, Epstein’s theory serves to categorize, in broad terms, two styles of thinking, and is extremely useful in this regard. For the remainder of this section, the terms “experiential” and “rational” will be used to refer specifically to aspects of Epstein’s theory, but “System 1” and “System 2” will be used to refer generically to dual-system theories.

It is not clear in Epstein’s dual-system theory, or in any other dual system theory, what exactly is meant by the term “system.” The visual and auditory systems are prototypical cases of systems, because these systems are isolable (Keren and Schul, 2009). Systems are isolable if one system can operate normally when the other is not functioning. This is the case with visual processing and auditory processing: deaf people can see and blind people can hear. System 1 and System 2 are not isolable in this way. Consider the following garden-path sentence: “Fat people eat accumulates.” A skilled reader’s habitual tendency to default to the active voice (i.e., System 1) automatically generates the incorrect meaning of this sentence prior to reading the last word. To arrive at the correct meaning requires System 2 thinking as the reader consciously struggles to make meaning of the sentence as “The fat that people eat, accumulates.” More generally, it would not be possible to arrive at any meaning whatsoever from this or any other sentence without System 1. For example, as we read, basic features of text are detected and integrated, letters and words are recognized, meanings are extracted, rules of syntax are followed, the eyes perform fixations and saccades while readers experience a continuous flow of text, and so on. The relationship between the rational and the experiential system is unlike that between vision and audition. System 2 simply cannot function without System 1.

The very language of dual-system theorists betrays the integrated nature of the systems. For example, Epstein defined some dichotomies in his theory in terms of continua. Indeed, for Epstein (2008, p. 26), the experiential system is “outcome-oriented,” “resistant to change,” “crudely integrated,” and involves “rapid processing,” whereas the rational system is “more process oriented,” “less resistant to change,” “more highly integrated,” and involves “slower” processing. Moreover, Epstein expressed other dimensions as dualities that might better be

characterized as continua. For example, he suggests that the experiential system is “intimately associated with affect,” whereas the rational system is “affect free” (p. 26). A dichotomy would require a clear cut-off point between what constitutes affective cognition and what constitutes affect-free cognition. Arguably, the well-known distinction between “hot” and “cold” cognition is really a matter of degree rather than kind (Janis and Mann, 1977). Similarly, dual-system theories characterize the difference between automatic and deliberative processes in either-or terms. But with repeated practice, tasks that at one time might have required deliberative processing can change gradually from deliberative to automatic. Driving a car, for example, becomes more automatic with practice. In sum, it is not clear that the dualities that theorists use to define the systems are in fact dichotomous (Keren and Schul, 2009).

The proposed relationship between the two systems is also unclear. Certainly, there is no trouble with the idea that two isolable and complementary systems might interact, inhibit, or facilitate the output of their complementary system. The McGurk effect is an excellent example of how the output of the visual system may interact with the auditory system, and can even dominate or modify its output. But, it makes sense to say that the visual and auditory systems interact because there are two isolable systems that could do so. Following Keren and Schul (2009), assume for the sake of argument that the defining dimensions of dual-system models are dualities, consider that with 16 binary attributes, a random combination of the outcomes of these dualities could result in  $2^{16} = 65,536$  different patterns of binary outcomes. In practice, combinations of binary outcomes would not be randomly determined. However, a dual-system model would postulate there are exactly two combinations of binary outcomes that occur as a group, and 65,534 hybrid combinations that do not. Even if the practical difficulties with testing such a model were ignored, it would still be necessary to demonstrate, for example, that tasks that enlist attributes with outcomes, say, a1 and b1 (for System 1) must also enlist outcome c1 and not c2 from the opposing system. This difficulty is compounded as the number of binary attributes is increased.

Under the assumption that there are two opposing systems, each of which has a specific pattern of outcomes, it would be difficult to explain judgments that are conscious (System 2) and automatic (System 1) at the same time, or that involve both abstract reasoning (System 2) and unconscious associative processes (System 1), or are flexible (System 2) and yet automatic (System 1). To allow for these possibilities, it would be necessary to relax the assumption that each isolable system relies on a unique combination of binary outcomes. But, if this assumption is relaxed, then it becomes less clear how a dual-system hybrid model would differ exactly from a multidimensional unisystem.

It is interesting that Epstein (2008) argued that the relative influence of the rational and experiential systems “is assumed to vary along a dimension of pure experientiality at one end, and pure rationality at the other” and that all behavior

is “influenced by both systems” (p. 25). Moreover, the “the relative contribution of the systems is . . . a function of the situation and person” (p. 25). In effect, Epstein here admitted that pure rational or pure experiential thinking are abstractions, and that it may be better to conceptualize rationality and experientiality as endpoints of a continuum, rather than as outcomes of separate, isolable systems. Moreover, Epstein (2008, p. 25) was aware of the similarity between his theory of personality and Hammond’s (1996) theory of the cognitive continuum, which explicitly embraces the unisystem concept. This makes the status of Epstein’s use of “system” tenuous for the reasons discussed above, and potentially confusing. Nevertheless, Epstein’s analysis of the dimensions of thinking will prove useful, as will be shown below.

Epstein (2008, p. 25) himself provided an example to motivate the concept of a cognitive continuum. He pointed out that although mathematics may be the paradigm case of rational mental activity, it also invokes the experiential system, since prior experience with mathematics can influence a student’s success in solving a mathematics problem. Epstein’s suggestion that math problems invoke experiential cognition is not at all unique. Consider the advice Feynman (Feynman, Gottlieb, and Leighton, 2013) gave to his students:

Now, all these things you can feel. You don't have to feel them; you can work them out by making diagrams and calculations, but as problems get more and more difficult, and as you try to understand nature in more and more complicated situations, the more you can guess at, feel, and understand without actually calculating, the much better off you are! (p. 72)

Feynman encouraged his students to develop their intuitions about physical problems, and to not let mathematics obscure their view of the deep structure of the problem. Presumably, the ability to listen to intuitions to solve physical science problems becomes especially critical as the problems get increasingly more complex.

It would not be unreasonable for a student to ask Professor Feynman how one might go about developing such intuitions. His answer to this question was honest but not particularly informative: “Now, how to explain how to do that, I don’t know” (Feynman et al., 2013, p. 73). Feynman suggested taking time to “look the problem over, and see if you can understand the way it behaves, roughly, when you change some of the numbers” (p. 73). There is, of course, a reason why Feynman found it difficult to explain how students might improve their intuitions: intuition is essentially unjustified cognition (Hammond, 2010). If Feynman was aware of the source of his intuitions, they would not be intuitions.

Feynman’s example of a talented mathematics student who lacked an intuitive grasp of physical science problems may be instructive. He asked the student where one might lean on a three-legged round table to make the table most unstable. The student responded by saying that he would attempt to calculate the force that would

produce lifts at various points on the table. Hence, Feynman's student leapt directly to a mathematical analysis. Evidently, it did not occur to this student to visualize what might happen with a physical table if he were to push down near the edge halfway between two of the legs. The implication is that this student lacked common sense in his overreliance on mathematical analysis. Feynman's example thus illustrates that effective scientific reasoning requires quasi-rational thinking. Reasoning about physical science problems does not occur in the absence of components that cannot be traced explicitly to a mathematical or to a logical system. This is true even if mathematical thought lies close to the rational pole of the cognitive continuum. Feynman's student did not benefit from experiential processing in this case, but it remains unclear from this example why this is so, or how that student might improve.

For Epstein, experiential thinking is no more devoid of rational thinking than rational thinking is devoid of experiential thinking. For example, Epstein (2008) suggested that although dreams obviously activate the experiential system, they have logical elements that require rational system processing (p. 26). Hence, dreams are not purely a function of the experiential system. Bruner (1986, p. 23) offered the following example of narrative, experiential thinking — two lines from T. S. Eliot's *The Love Song of J. Alfred Prufrock*:

I should have been a pair of ragged claws  
Scuttling across the floors of silent seas

Epstein would probably maintain that if readers resonate to these lines, they do so largely at an experiential level. The pair of ragged claws draws a striking analogy between the protagonist and a bottom-dwelling crab, which symbolizes metaphorically horizontal rather than forward movement. The silent seas elicit feelings of isolation and loneliness. However, the capacity of these lines to elicit intuitive reactions is presupposed by the logical construction of the phrases, and the reader's ability to analyze them. It is important to note that Bruner used this example to illustrate narrative-mode processing. For him, what mattered was that interpreting a poem required a different set of criteria than those that are involved in evaluating a logical argument.

One final example of integrated cognition might be helpful. Gladwell (2000) wrote about an interview he had with a young computer scientist named Nolan Myers. Gladwell was interested in what an interviewer might glean from an interview, above and beyond deliberative thinking. Gladwell was evidently quite impressed with the young man he had just met:

I have never talked to his father, his mother, or his little brother, or any of his professors. I have never seen him ecstatic or angry or depressed. I know nothing of his personal habits, his tastes, or his quirks. I cannot even tell you why I feel the way

I do about him. He's good-looking and smart and articulate and funny, but not so good-looking and smart and articulate and funny that there is some obvious explanation for the conclusions I've drawn about him. I just like him, and I'm impressed by him, and if I were an employer looking for bright young college graduates, I'd hire him in a heartbeat. (p. 68)

Gladwell conceded that Nolan's appearance and likeable demeanor may have contributed to his positive first impression of Nolan, but to Gladwell this did not seem sufficient to explain his very positive impression of this young man.

Gladwell intended to emphasize the powers of intuition, but it is not difficult to find examples of logically-defensible cognition in his account of his interview with Nolan. For example, Gladwell was aware that Nolan would soon graduate from Harvard with a degree in computer science, that he has a good relationship with his parents, that Hadi Partovi (an executive of a Silicon Valley startup) had recommended Nolan to Gladwell, that Nolan had completed an internship with Microsoft the previous summer, that Microsoft had done an extensive analysis of Nolan's background and character, that Nolan was already working between 80 and 100 hours at school, and so on. Surely, Gladwell's first impression (or Partovi's) was at least partially unjustifiable. As Gladwell points out, many people have this young man's qualifications, but simply are not as personable as he is. Obviously, tasks that require some intuitive skill, such as an interview, are never devoid of opportunities to employ reason. The opposite is also true: that no matter how much we think we are aware of the reasons for our judgments, there are opportunities for non-analytic factors to influence those judgments. An interview lies somewhere on the continuum between mathematical reasoning and a poetry reading. But, it would be useful to know just where on the continuum it lies, especially since interview judgments could have an impact on an individual's livelihood. Certainly it does not help to be told about the powers of intuition without an explanation as to what is meant by that. But, Gladwell cannot say, because intuition involves knowing without knowing how one knows.

If all thinking is quasi-rational in this sense, then it makes no sense to say that thinking is either rational or experiential. The task is not to decide which of the two systems is appropriate to use in various settings, as is commonly suggested by popular science writers. Rational and experiential thinking do not represent isolable systems like vision and auditory perception. It might be useful to draw an analogy to a multi-channel stereo equalizer. To a music connoisseur the optimal settings on an equalizer will depend on the music one is listening to, and could vary depending on whether the music is classical, jazz, or rock and roll. Similarly, cognitive skill in a judgment task might be optimized by a certain pattern of settings of  $n$  continuous dimensions in a single multidimensional system. Moreover, there is no reason to think that any given task must require a fixed configuration at any point along the continuum. It should be desirable for a decision maker to move closer to one pole or to the other as demands of the



tasks change, new knowledge or information becomes available, cognitive skills improve, or the person is motivated to expend additional effort. To say that judgment is quasi-rational is in no way to denigrate it as irrational, illogical, or poorly executed. Quasi-rational judgment is dynamic, and reflects the adaptability of thought to uncertainty inherent in the ecology of the judgment task (Hammond, 1996, 2010). The next section shows how a model of integrated cognition might be applied to ethical judgment.

### *Application: Facilitated Communication*

The debate about empirically supported therapies continues in psychology (Arkowitz and Lilienfeld, 2006), but as Lilienfeld (2007) has argued, the ethical obligation to do no harm may make it prudent to give priority in this debate to the problem of potentially harmful therapies. Lilienfeld lists several such therapies. Facilitated communication is notable, because it is well-known that under certain circumstances, communications purportedly obtained from autistic clients by means of facilitated communication originated in the facilitator, and not the client. Moreover, facilitators may have been, and may continue to be, unaware that they influence their clients' responses in this way. In a set of highly publicized cases, facilitators unintentionally harmed their clients and their clients' families by unwittingly typing false allegations of sexual abuse.<sup>1</sup> Unfortunately, advocates of facilitated communication continue to use it, and continue to insist that it is highly effective, despite warnings from the American Psychological Association that it could be harmful. This judgment would seem to be unethical and unwise, given the potential for causing harm.

Imagine a therapist, Tom, who is working with autistic clients. Tom is highly committed to the welfare of his clients. Assume further, that Tom has considerable experience working with this population, and has been struggling with traditional approaches, which have been more or less ineffective to various degrees. Tom has become curious about alternative possibilities. Given this, Tom is in a risky situation. He could continue to use traditional, but ineffective, solutions, or he could experiment with lesser-known approaches, in hopes that something might prove to be more effective. Suppose Tom decides to try facilitated communication. To make this decision he would need to relax the criterion that therapies require justification via logic or evidence. In Epstein's terms, he would need to adjust this component of his thinking toward the experiential pole, and away from the rational pole of the continuum. This is not a binary choice. That is, Tom will not necessarily swing all the way to the experiential pole on this dimension, and interpret the effects of facilitated communication as self-evidently valid. Tom's

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<sup>1</sup>For a brief overview of the facilitated communication controversy see <http://www.apa.org/research/action/facilitated.aspx>.

thinking may be quasi-rational, but it is not necessarily irrational. He may have an open mind with regard to facilitated communication, but he may still remain cautious, for example.

Moreover, moving away from the rational pole on the dimension of justification does not necessarily mean that Tom will do so on all other dimensions of quasi-rational thinking. In fact, Tom's decision to search for other therapies could be interpreted as a move in the direction of the rational pole of the continuum, away from the experiential pole. Quasi-rational thinking is more resistant to change when it is nearer the experiential pole. Tom's desire to do well by his clients has motivated him to search for a more effective alternative, which is a reasonable, and even commendable, goal. It is crucial to understand that Tom's judgment is in no way "purely intuitive." Tom's decision to consider alternative approaches need not imply acceptance of the bromide "experiencing is believing," or of any other features of so-called intuitive thinking. A search for alternatives may be justified under the circumstances. Thus, at least this aspect of Tom's thinking is closer to the rational pole.

Trouble may come if Tom adopts facilitated communication and is won over on grounds that it feels right; that is, to use Epstein's (2008) language, if Tom is influenced by the "hedonic principle" more than the "reality principle" (p. 26). To the extent that Tom abandons the reality principle, Tom is no longer operating on grounds that it is better for logic and evidence to be one's guide. However, even here, moving away from the rational pole does not necessarily imply a total rejection of the reality principle. Epistemic humility would, of course, require caution. But again, Tom is not making a purely intuitive decision, even if he allows his judgment to be influenced by the hedonic principle. His judgment is quasi-rational. In fact, in this case, a combination of experiential and rational tendencies may entice Tom to err. Suppose Tom, like others duped by facilitated communication, experiences facilitated communication actively and consciously, so that he believes that he is in control of his thought. Epstein posits that this belief is typical of thinking at the rational pole of the continuum. But, when taken in combination with a desire to find a more effective therapy, and experiential tendencies, such as using what feels good as a guide to action, accepting outcomes as self-evident, and becoming passionate about using facilitated communication, the technique becomes insidious. It is precisely the facilitators' rational belief that they were in control of their thoughts that led some unintentionally to cause harm to clients and their families despite good intentions. Thus, it is likely that a combination of experiential and rational elements led to unwise judgment in this case.

Tom might achieve wiser judgments if he could adjust other dimensions of his thinking toward the rational pole of the continuum. For example, perhaps Tom is interested more in outcomes than processes. This could be problematic. An unbalanced emphasis on outcomes may not facilitate the process of questioning one's beliefs regarding the processes that gave rise to those beliefs. For example, beliefs that can be justified by the extent to which they are based on

reliable validation procedures may warrant greater confidence than those that do not. Also, if Tom is overly satisfied with broad generalizations than with more nuanced assessments, he may conceivably be prone to err. Similarly, if Tom cultivates an interest in determining cause and effect relationships he might avoid dangers that are inherent in facilitated communication: of drawing unjustifiable conclusions based on false contiguities between what was communicated and by whom. Moreover, if Tom is like many therapists in that he values his clients' narratives, he should be aware that, in this case at least, narratives may be a gateway to disaster. The take-home point for the facilitated communication debacle may indeed be that training in abstract, scientific method might have prevented the harm that was done to clients, and might prevent similar harm in the future. But, uncertainty will nevertheless ensure the continued application of some unjustified aspects of judgment in this, or any, judgment task. The effort to avoid harm requires due diligence to find sufficient correspondence between an appropriate point on the cognitive continuum and the requirements of the task.

Though it is arguable that the potential for harm may not have been known to early advocates of facilitated communication, this is certainly not the case today. A sincere and comfortable conviction that the therapy is useful will not absolve Tom of responsibility if he harms someone when he uses facilitated communication, even if he has the best of intentions. Suppose that Tom was unaware of the history of facilitated communication, and unaware of its potential to cause harm, but learned about the controversy from a concerned colleague. This new information may become an opportunity for him to recalibrate his thinking. Perhaps he will, or ought to, adjust his thinking so that it is generally closer to the rational pole of the continuum. Again, this would in no way mean that Tom should now be any less interested in narratives, or any more interested in measurement. Perhaps, Tom will become more aware that he may or may not be entirely in control of his thoughts with regard to this procedure, but this does not mean that he will come to the conclusion that he is now, or ever was, passively and pre-consciously seized by his emotions. Hopefully, he will become more skeptical about the procedure, and less willing to use it merely because it feels right. Perhaps he will explore the empirical literature on facilitated communication's potentially harmful effects, and therefore, become more alert to the causes of those effects. The point is that wisdom requires flexibility when new knowledge becomes available, or the demands of the task change. The possibility of movement on the continuum as befits the task is the key to understanding the dynamic nature of quasi-rational judgment.

### *Conclusion: Wisdom and Quasi-Rational Thinking*

A theory of wise judgment cannot be attained by taking a purely descriptive approach. Careful consideration of the normative aspects of cognitive activity is important as well. To be fruitful, judgment research should involve more

than just an attempt to gather data that are pertinent to narrowly conceptualized hypotheses. It should also focus on an analysis of cases of well-justified and poorly-justified thinking. Wise judgment is not necessarily to be equated with expertise, but it involves cognitive activities that experts often engage in: rational reflection, dialogue, self-criticism, flexibility, open-mindedness, a concern for the truth, and an ability to empathize with advocates of opposing points of view, and with those who may be affected by one's judgments. Experts may or may not exercise independent reason in this way — they may not be wise in this sense.

The topic of intuition has gained the interest of many popular-science writers in recent years, and this is a welcome development. However, rational analysis is typically characterized by these writers as painfully slow and effortful, and so perhaps even outdated, in today's fast-paced, ever-changing world. By contrast, intuition is often depicted in the popular press as the miraculous power of thinking without thinking. Many professional researchers are less certain about the so-called powers of intuition, but even among researchers, the tendency has been to separate thinking from the values of the thinker and her worldview, and to avoid an analysis of dialogical thinking and affective obstacles to rational thought. Dual-system approaches provide grist for the popular science mill by explicitly separating cognition into two systems. Hence, as Simons and Chabris (2010) pointed out, it seems obvious that the "key" to successful decision making "is knowing when to trust your intuition and when to be wary of it." Yet, there is a striking contradiction in this apparently innocuous comment.

It is problematic to assume that knowing when to trust intuition is a key to anything. As Hammond (2010) insisted:

[The] recommendation "to knowing when to trust your intuition and when to be wary of it" is useless because it asks the impossible; it is impossible because that knowledge is precisely the knowledge that intuition does not provide. It is precisely the properties of intuition (e.g., "lack of awareness of justification," by any common definition) that makes it impossible to be aware of the fit between your intuition and the specific circumstances that allow you to know when to trust your "intuition." (p. 336)

For Hammond, judgment researchers should abandon the concept of intuition and replace it with the concept of quasi-rational thinking. This is because "intuition" does no theoretical work. As Hammond pointed out, the word "intuition" literally means "unjustified cognition," and as such, it is unclear what researchers even mean when they use that term.

Hammond (2010) further contended that researchers would do well to broaden their methodologies to include analyses of cases of well-justified versus poorly-justified judgment, rather than to contrast analysis with intuition in an attempt to determine when to use and when not to use one system or the other. Thinking is more nuanced than popular dual-system approaches

imply. Quasi-rational judgment is multidimensional, and the dimensions can be specified, if only provisionally. Epstein's dimensions provide a concrete starting point for empirical analysis, at least if they are considered continua rather than dichotomies. For every judgment task, some aspects of quasi-rational judgment will lie closer to the rational pole, and others will lie closer to the experiential pole. There is no a priori reason to assume that movement along a dimension should necessarily be followed by movement in the same direction along the other dimensions, nor is there any reason to think that wise judgment will consist of unified movement along all of the dimensions toward the rational pole. The details are matters for empirical analysis.

Wise judgment is a dynamic, adaptive, multidimensional process that is attuned to the task at hand, sensitive to fluctuations in knowledge, the goals of the decision maker, and the moral obligation to be intelligent. There will be no substitute for the hard work of determining the underlying dimensions of judgment, delineating an adequate theory of cognitive complexity, and discovering exactly how skilled decision makers calibrate their judgments to the ecology and demands of the task. Nevertheless, something like the type of theoretical and empirical investigation outlined here could help to move decision researchers toward a more fruitful approach to understanding how people make wise judgments. The key to understanding wise judgments lies not in knowing when to use or when not to use intuition. Rather, as Midgley (1978, p. 122) insisted, the key is to appreciate that science and sympathy are neither alternatives nor opponents; they are integrated into all aspects of life, and we need them both.

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