

# The Value of Ingenuity

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**ABSTRACT:** Ingenious activity has been taken to be valuable because it constitutes a remarkable frugality or economy of means in arriving at creative solutions to given problems. Taking as a starting point for discussion a recent pamphlet, *How to be Ingenious*, produced by the Royal Society for the Encouragement of Arts, Manufacturers and Commerce (RSA), I engage critically with recent attempts to define ingenuity as a subclass of creativity. By challenging each of three criteria that have been identified as central to its definition I develop an original account of ingenuity and its value. The discussion is divided into three sections. The first briefly outlines the RSA’s approach to and account of ingenuity, suggesting two initial concerns and offering a range of examples to be discussed throughout. Section 2 engages with and develops each of the identified criteria for ingenuity, appealing for clarification to a useful discussion in the philosophy of art. The implications for our understanding of ingenuity, and in particular its value, are set out in section 3, along with an amended definition of this form of creativity.

**KEYWORDS:** Creativity, ingenuity, originality, economy, value.

## I. Bounded Approaches to Creativity

Many readers of this edition of *Trópos* will be familiar with the distinction between bounded and unbounded approaches to creativity, and with the contention that unbounded approaches are generally thought to be more fertile. As Hoegl *et al.* summarize: “Unbounded randomness is beneficial [...]; in order to find one good idea, hundreds, if not thousands of ideas are needed” (Hoegl *et al.* 2008: 1385). This approach is in tension with the stance of Finke *et al.* (1992) who contend that “limited resources force one to think in more creative and less conventional ways” (cited in Young 2011: 34). This latter approach to creativity has recently been identified by the RSA as involving one subclass of creative activity, namely ‘ingenuity.’

Let me start, then, with an addition to Margaret Boden’s lexicon of different forms of creativity (Boden 1990: 2) by referring to this subclass as

‘ingenious-’ or ‘I-Creativity.’ The RSA’s discussion generates the following working definition of I-creativity that can be used as an initial focus for the discussion to follow: I-Creativity is the solving of a practical problem by combining remarkably few resources in an unusual or surprising way. I-creative (ingenious) people have learned to be *consistently good* at devising such solutions. This definition reflects the RSA’s contention that ingenuity has *three* central characteristics: (1) it is a form of creativity, hence it involves combining ideas in ways that are unusual, neat, clever, or surprising; (2) it is a *frugal* form of creativity, utilizing the resources at hand; and (3) it is the creative solving of some pre-existing practical problem (Young 2011: 5–10). I-creativity is distinguished from creativity more broadly construed on the grounds that the latter is not thought to essentially involve the need to be frugal, nor need it constitute a ‘solution’ to some pre-existing problem. Likewise, ingenuity is distinguished from *innovation* on the grounds that the latter emphasises originality while the former only requires that the problem should be solved within certain parameters (Young 2011: 4, 10–12).

The engineer is a prime example of one capable of demonstrating ingenuity. For example, the RSA’s pamphlet cites Ron Howard’s film *Apollo 13* (1995), dramatizing the work of Ed Smylie and his team of NASA engineers who improvised maps, duct tape, and other available materials into a device capable of removing excess carbon dioxide from the Apollo astronauts’ cabin. In more everyday situations the character of the *bricoleur* (handyman or tinkerer) is emphasised along with a range of familiar ‘make-shift’ solutions many of us are capable of, such as using a shoe to block open a door. The ways in which SMS and Twitter have prompted the dropping of linguistic rules to form a more space-efficient language in line with restrictions in message length are also cited (Young 2011: 14). A final class of illustrations draw together examples from the arts, including improvisational comedy, and the ability to create Haiku. Much discussion in this domain has been limited to ingenuity in the face of *practical* problems, and while this focus is understandable, I want to briefly suggest two notes of caution before we proceed.

The first is that in order to avoid an impoverished understanding of I-creativity we should consider a range of domains in which ingenuity appears prominent. Sport, for example, seems to be a domain in which ingenuity will be a mark of success given that it is densely populated with situations in which various kinds of problem (such as gaining possession of the ball, scoring a point, or winning the game) may be solved via activity that requires utilizing limited resources. In the 2011 Queen’s tennis final Andy Murray successfully executed a return shot against his opponent Jo-

Wilfried Tsonga by playing through his own legs.<sup>1</sup> This kind of move is not wholly original and could constitute as much a part of one's tennis playing oeuvre as the serve (Roger Federer, for example, has executed similar shots against Novak Djokovic in the 2009 US Open semi final, and against Brian Dabul at Flushing Meadows in 2010 – the potential for this to become a 'signature move' is apparent), of course, this is no problem for the RSA, according to whom originality is thought not to be an essential requirement for I-creativity.

Such examples go some way in drawing attention to a second note of caution regarding approaches to understanding I-creativity. This is that most of the 'ingenious' examples cited above are obviously impressive and highly valued. Yet while the type of sporting play referred to above seems to fit the working definition of I-creativity, it is often (although not exclusively) referred to in *pejorative* terms: as 'cheeky,' 'dangerous,' 'reckless' or even a 'fluke.' There are, I suggest, a range of cases in which the role of improvisation stressed in many of the RSA's examples invokes a less positive evaluation of the use of ingenuity. Consider the poorly prepared talk show host or candidate for a job interview, both of whom successfully manage to 'get by on their ingenuity,' delivering a satisfactory but fairly off-the-cuff interview. Or consider the child who, on the request to tidy his room, arguably demonstrates some ingenuity by cramming all his discarded clothes, books, and toys under the bed in order to placate his parents while freeing up his afternoon for more entertaining pursuits.

Perhaps not all such examples will be accepted as non-question-begging cases of genuine 'ingenuity.'<sup>2</sup> While I suggest each meets the initial criteria, I concede that some may be unintuitive; regarding others (for me at least) intuitions remain unclear. Progress can be made by engaging more carefully with each of the three proposed criteria for I-creativity in order to arrive at an understanding of this form of creativity that will enable us to systematically mediate such examples, and our value judgements about them. As such, this discussion has a dual purpose throughout. One task (undertaken in section 2) is to clarify the criteria for I-creativity. A second task (addressed in section 3) is to go some way to articulate both the respects in which this form of creativity is thought to be valuable, and the circumstances in which more pejorative judgements may be understood.

<sup>1</sup> Another well known example that comes to mind is the Colombian goalkeeper Rene Higuita's famous 'scorpion kick' in which Higuita executed an unconventional, yet successful block to a shot from England's Jamie Redknapp in 1995.

<sup>2</sup> Or as cases in which it is the use of ingenuity per se that attracts criticism – I am grateful to an anonymous referee for drawing my attention to this suggestion.

## 2. The Criteria for I-Creativity

My overall objectives involve widening, as well as clarifying, the scope of discussion of I-creativity. In 2.1. I call for clarification by challenging the RSA's capacity to capture a sub-class of *creative* activity. The task of widening the scope of discussion begins in 2.2.-2.3. where, after establishing that sole appeal to economy of means (for example) is inadequate to the task of characterizing I-creativity, I open the way for considering other respects in which creative problem solving may be bounded, and in which such activity may be valued. There are various ways in which one can demonstrate valuable resourcefulness *qua* creative problem solver – in the final part of the present section (2.4.) I develop the suggestion that creativity and resourcefulness can even extend to the act of problem identification itself.

### 2.1. First Criterion: The Role of Originality

Dropping originality from an account of I-creativity looks contentious in so far as at least some accounts of creativity in general – of which I-Creativity, recall, is supposed to be a subclass – include such a criterion. To identify a sub-class, one must increase the specification of the overarching classification rather than dropping some criteria relating to it. The omission of originality is probably the result of two related features of the RSA's approach, both of which may be challenged. The first is the explicit distinction drawn between *innovation* and *ingenuity*, according to which only the former needs to deliver something original. Ingenuity “assumes that ideas don't have to be new to be useful” (Homer-Dixon 2000: 230). The second is the recognition that everyday acts of ingenuity are fairly ubiquitous. For example, I-creativity in quotidian contexts is variously illustrated via reference to Jane Fulton Suri and IDEO's publication *Thoughtless Acts?* (2005). This photographic collection invites the audience to notice the subtle but ubiquitous ways in which people react to the world around them, and includes phenomena such as using a chilled drinks can to cool one's forehead on a hot day, tying one's house key into the laces of a running-shoe in order to avoid losing it mid-run, or using a finger as a make-shift bookmark in a temporarily closed book one is carrying.

Following Flanagan (1963), the RSA's first criterion involves the claim that ingenuity is the ability to combine chosen resources and/or ideas in ways that are novel, clever, or that few would expect by avoiding so-called ‘functional fixedness’ (the tendency to think of an object only in terms of its typical or original functions). Yet the pervasiveness of the above kinds of

examples illustrate that, in this domain at least, ‘functional fixedness’ is no great problem and such makeshift solutions are familiar, often wholly unsurprising, and apparently unoriginal.

One response to these observations would be to question the inclusion of such examples, or – as is my preference – to treat many as at least borderline cases that should not be thought primary to the task of defining I-creativity. However, Boden draws a distinction between psychological- or ‘P-Creativity’ and historical- or ‘H-Creativity’ that may also be instructive here (Boden 1990: 2). P-creativity occurs when someone has a valuable idea that is original-to-them in the sense that it could not have occurred *to them* previously. This contrasts H-creativity that occurs when someone has an idea that has not occurred *to anyone* previously. The distinction allows certain combinations of ideas to constitute a form of creativity (P-creativity) even though they may not be wholly (historically) original or novel. The ubiquity of the everyday solutions discussed above suggests that many are not *historically* original, and often appear not to be *psychologically* original either. Still, at least for some such examples it may be that while the *ideas* used are not new or original, the *uses* of such ideas will be original in at least the sense associated with P-creativity. Someone else’s idea could be used as a psychologically original solution to *my own* problem of frequently losing my house key while running, even if that idea was taken from a prior context in which it constituted a solution to a very similar problem.<sup>3</sup> In this sense, ideas don’t have to be (historically) new to be useful, yet the importance of (psychological) originality can still be accommodated.

There are various differing accounts of creativity, and not all readers will accept the version I allude to (but do not defend) above. Still, all should accept a minimum requirement here of *consistency*. Whatever one takes creativity to involve, the corresponding notion of I-creativity will be constituted by *doing those things* in accordance with the remaining criteria. According to the RSA, I-creativity is a subclass of creativity in that it is a form of creative problem solving, and (furthermore) a subclass of creative problem solving in that it is a form of *frugal* or *economical* creative problem solving. Thus I propose to leave the first criterion, turning attention to the criteria supposed to identify *ingenious* creativity in particular.

<sup>3</sup> One consequence of this move is that some forms of plagiarism might constitute I-creative acts. While contentious, I am prepared to accept that this is correct, given that I allow for more pejorative judgments of ingenious activity.

## 2.2. Second Criterion: Ingenuity, Fortuity, and Skill

The second criterion in our working definition risks defining I-creativity out of existence. I will argue that we should allow that ingenuity could be the result of less frugal, more labor-intensive processes. This suggests a *prima facie* need to amend the second criterion for I-creativity that I will develop further in 2.3.

Consider the distinction between creative products and creative processes. Initially, the ‘frugality or economy of means’ criterion seems to make ingenuity at least very difficult to establish. We might be too quick to judge that some activity (the construction of a Haiku, or ‘tweet’ for example) really demonstrated I-creativity given that frugality of resources in the final *product* needn’t be indicative of the relevant frugality of creative *process*. But the difficulty is more acute for in order to attribute to individuals and teams some genuinely ingenious behavior we will often need to attribute to them a fairly substantial amount of relevant and unavoidable background or preparatory work. In the apparent spontaneity and simplicity of outcome, Murray’s ‘trick shot’ had the appearance of being something anyone could do, but this is not the case. Many could swing a racquet such as to return a shot as Murray did – a poor tennis player like myself could do so accidentally – but this wouldn’t constitute an act of ingenuity. Rather, it would simply be an act of *fortuity*.

Those inclined to call the shot ‘fortuitous’ rather than ‘ingenious’ might be focusing on the significant role of ‘luck’ envisaged. To see this, just suppose that Murray worked to significantly diminish these features by training for this kind of scenario in advance; spending hours practicing such shots from all parts of the court in recognition that it could sometimes pay off to possess this skill. In so doing, his play moves further within the domain of *skill* rather than *luck*.<sup>4</sup> Like other more standard moves (such as the ‘block,’ or overhead ‘smash’) this shot was always part of the conceptual space of the game (i.e. was always within the rules, and at least physically possible), but through extensive training it becomes part of the stock of activities that can be non-fortuitously attributed to the player.

<sup>4</sup> Skills tend to be analyzed in terms of counterfactual success, and it is plausible to claim that putting in a great deal of training is not the only way to ensure or increase the possibility of counterfactual success – some people appear to be *naturally* skilled in certain respects. This admission, is, of course, less pertinent to a discussion concerning ways in which ingenuity might be *enhanced* in individuals. Berys Gaut (2003) has also discussed the importance of eliminating purely fortuitous occurrences via his notion of “flair.”

This provides initial grounds for suspicion regarding the adequacy of the second criterion for I-creativity given that (a) the appearance of economy or frugality can often be deceiving, and that (b) the role of skill in attributions of creativity requires that in order to attribute I-creativity to an individual or team one must often attribute to them rather *uneconomical*, lengthy, and onerous means. I will later argue that some appeal to economy or frugality as a feature of valuable I-creativity can be salvaged, but this must be postponed until discussion of the third criterion in 2.4. First, I will develop concerns about the second criterion – as well as suggesting a more viable alternative – by returning to the matter of more pejorative views regarding the use of ingenuity.

### 2.3. *Monroe Beardsley on Valuing Economy*

The *bricoleur* is taken to be illustrative of one who has a valuably frugal approach to resources in the context of problem solving. “Rather than procuring exactly the right tool for the job, the bricoleur uses whatever is available, no matter how seemingly irrelevant” (Young 2011: 7). Recalling the broken desk of one of my old philosophy professors, propped up at one end by a pile of books (the desk, not the professor), the capacity to limit oneself to the resources at hand is not an attractive capacity in all cases and often seems to evoke *making-do* rather than *making-good*. Perhaps the philosopher in question would demur, insisting that his time was better spent contemplating a philosophical text than a furniture catalogue. As with the sporting examples, we are once again faced with a difference of opinion regarding the value of (frugal) ‘ingenious’ activity. The activities of the bricoleur appear to include economical solutions some will find highly valuable while others find only minimally (if at all) satisfactory. In order to clarify the situation, and to offer a final concern regarding the second criterion outlined above, I enlist a discussion from the philosophy of art developed by Monroe Beardsley (1956).

Philosophers of art often distinguish between talk of local properties of an artwork (formal or ‘surface’ features such as particular lines and arrangements of colour) and talk of its regional properties (such as aesthetic or relational properties). Beardsley draws this distinction before characterizing the familiar claim that the local properties or ‘means’ of an artwork give rise to its regional properties or ‘ends.’ Critics will often draw attention to the way in which this occurs by saying, for example, that the represented light and airiness of Rembrandt’s etching is achieved by a remarkable economy in the rendered lines on the work’s surface. However, Beardsley presents an



argument to the conclusion that at least such claims about *economy* are incoherent. The argument can be represented as follows:

Premise 1: The ‘means’ on an artwork give rise to its ‘ends.’

Premise 2: Critics often draw attention to the manner in which the ‘means’ of a work give rise to its ‘ends’ (such as claiming that some end is achieved by a remarkable economy of means).

Premise 3: To say some end was achieved ‘economically’ implies that *the same end* could have been achieved less economically.

Premise 4: But no less economical means would give rise to *the same end*; in art, means are not separable from ends.

Conclusion: Therefore, it is incoherent to say that some particular end was achieved by a remarkable economy of means.

The addition of premise 3 seems uncontentious, resting on the plausible assumption that things can be undertaken more or less economically. Regarding Beardsley’s fourth premise, derived from premise 1, the thought is that sometimes it is possible to talk of ‘means’ and ‘ends’ as two separate things (my tennis lessons were bought *by means of* money), but to say that the beauty or airiness of an etching is achieved by means of an arrangement of lines is not analogous to these but to cases such as the claim that my house is built by means of an arrangement of bricks. The house *just is* this arrangement of bricks in the same way this particular light and airy etching *just is* this arrangement of these particular lines.

Still, just as the house can have characteristics the individual bricks do not, so too can the etching, as a whole, have characteristics the individual lines do not. The art critic draws attention to the various ways in which formal properties give rise to regional aesthetic and representational properties. But Beardsley thinks that to say *this lightness and airiness* is achieved ‘economically’ is confused precisely because the appeal to economy in this context implies that *the very same effect* could have been achieved by more extensive means – via more lines, for example. But this is not so because of the nature of the relationship between aesthetic and formal properties in this context.<sup>5</sup> Etchings, in general, can have more or fewer lines than this one but this particular aesthetic outcome could not have been achieved with more or fewer lines. Rather, Beardsley thinks that what the critic actually means when saying some element is ‘superfluous,’ or that the means to this end could be ‘more economical’ (or less so) is not that some lines

<sup>5</sup> This claim can proceed without accepting aesthetic formalism. Kendall Walton (1970), for example, has adequately demonstrated that aesthetic properties do not supervene on formal properties alone.



are superfluous to *this* whole but that a different (counterfactual) whole composed of more or fewer lines would be preferable to the actual whole that includes these local features. The omission of certain lines would not make the etching *more economical*; rather, they would make for a better – but different – etching (Beardsley 1956: 374). I suggest that an analogous stance should be taken regarding discussion of frugality or economy in relation to I-creative problem solving.

The analogy proceeds as follows: to say that we value (say) Murray's shot because of its ingenuity cannot be to say that *the same shot* could have been achieved via less frugal or economical means. For, we cannot say the specific end delivered from this one move other players could only have delivered via more extensive means. But, as with the etchings, one might be able to express a preference for the counterfactual situation of being faced with a *different problem* to the one in fact faced, preferring the solution that might resolve *that distinct problem*. This point may be obscured by an insufficiently fine-grained conception of Murray's particular problem or of the end he achieved in solving it. For example, where the end is merely construed as 'winning the game' or 'returning the ball' one might feasibly claim that different means could have brought about 'the same end' (and thus that some means will be more economical than others). But the particular problem Murray faced involved additional constraints dictated by (for example) his current location on the court, the position of his racquet, and so on. Murray (or his fans) might express a preference for a different situation in which there had been time to maneuver the racquet into a more comfortable position, or in which he had been able to play from further back on the court, enabling play of a different kind. But this is not the claim that his solution to the actual problem was remarkably economical; it is an expression of a preference for being presented with (and resolving) a different problem to the one in fact encountered. It is true that one solution may be more or less economical than the other, but part of what is being compared here are solutions to two different problems, not two different solutions to one and the same problem.

In the same vein, the NASA engineers might have wished that they were grappling with a slightly easier problem; less constrained by time or limited resources than the actual one. But these would not constitute the same problem, so would not provide a context in which less economical means might have brought about the same end. In such cases, to cite remarkable economy of means to ends as a feature of the solution appears confused. Thus it appears once again problematic to appeal to 'economy' or 'frugality' in the identification of I-creativity. Not only does it appear that in some

cases of ingenuity such economy is not obviously present, but (following Beardsley) the claim that a solution to some given problem is remarkably economical will, in many cases, be incoherent. On the latter point, I agree with Beardsley that such talk is mistaken, but suggest the mistake to be a revealing one.

#### 2.4. *Third Criterion: Problem Solving and Problem Seeing*

One thing that this mistake reveals is that, as with the other two criteria for I-creativity, the third criterion (deriving a solution to a given problem) is also in need of clarification and development. Rather than defining I-creativity in terms of a particular kind of solution (one that is remarkably frugal) to a given problem I suggest ingenuity should be understood in terms of the deriving of a creative solution to one particular kind of problem *rather than another*. Following Beardsley, I have suggested that the literal expression of preference for more economical creative problem solving should be characterized as conveying a preference for (being engaged in finding a creative solution to) one problem rather than another. It may often appear unproductive to express such preferences; however, I will briefly detail two respects in which such claims can be instructive in this domain.

Firstly, one issue that emerged in the previous section was the difficulty involved in identifying or specifying particular ‘problems.’ The third criterion for ingenuity made reference to problem solving ability and I suggest that many disputes about the ‘ingenious’ credentials of certain acts, as well as disputes about the value (or not) of ingenuity in some contexts, stem from disputes regarding this criterion. Faced with a broken desk, the professor characterized his problem as one of coming up with a quick, non-technical, but minimally satisfactory way of holding up the tabletop. A carpenter in the same situation might envisage a different problem: one of producing a replacement leg out of matching materials, for example. Beardsley’s discussion reveals that it is not simply that the carpenter has come up with a less economical solution to the same problem as conceived by the professor. The carpenter is certainly able to do more, but more in response to a *different* problem; one that the professor is not concerned about. The difference between the professor’s solution and the carpenter’s is not just a matter of economy, it is a matter of *which* problem is to be engaged with. One act is more economical than the other, but the value ascribable to that act is not simply grounded in greater economy of means but in the fact that only one activity constitutes a satisfactory solution to the specific problem envisaged.

Secondly, regarding pejorative judgments of I-creativity, appeal to Beardsley's account reveals that when one criticizes 'economical' creative solutions one may really be expressing a desire for a different starting problem to which other, more extensive, kinds of creative activity might have been possible – the assumption being that in arriving at a solution to a different problem, something *better* might have occurred. The parent whose child meets the instruction to tidy his room by hiding everything under the bed might criticize this 'economy of means,' thereby expressing a wish that the child had engaged with and attempted to solve a different problem (involving *organizing* rather than *hiding*, for example). The parent could, however, congratulate the child on his (otherwise admirable) capacity for ingenuity while also taking the opportunity to educate him on the merits of re-conceiving the original problem expressed by the instruction to 'tidy up.' The parent and the child had different conceptions of the problem in hand such that the child's tidying was entirely satisfactory as a solution to one problem, but only minimally (if at all) satisfactory as a solution to the other. The lesson to be learned – on both sides – seems to be about the importance of clear, complete, and agreed articulation of an initial problem.

The implications of this for a wider interest in ingenuity and its enhancement become clear once it is recognized that what is being suggested is not the recommendation of one particular kind of creativity over any other. Rather, what is recommended is more general training in problem-identification. Not just with the aim of enhancing creative *ability*, but with the aim of ensuring that teams and individuals endeavor to engage creatively in the pursuit of outcomes that are thought valuable to all concerned. It seems that when we evaluate ingenious activity, at least part of what we value is the capacity of individuals and teams to conceive of a given situation or conceptual space as generating one problem rather than another.<sup>6</sup> On the basis of this one might suggest that among the attributes one should hope to encourage in ingenious individuals and teams will be the general ability to engage flexibly with the task of identifying problems within some conceptual space to which creative endeavor might be applied.

<sup>6</sup> By 'conceptual space' I refer to some identifiable domain of interest in which a problem (or range or problems) might be identified and creative solutions applied. The professor's broken desk, for example, generates a conceptual space in which problems might be identified relating to this state of affairs. A more detailed account of 'conceptual spaces' can be found in Boden (1990).

### 3. The Values of I-Creativity

So far, I have agreed that I-creativity should be defined as a valuable form of creative problem solving, but argued that the further claims that it is by definition a particularly *economical* form of creative problem solving, or that this constitutes an essential feature of its value, are unsatisfactory. I see no reason to limit the explanation of the value of I-creativity to one feature (such as economy of means) alone. This final section briefly illustrates some other possible contenders for relevant values and also formalizes the definition of I-creativity I have been working towards throughout.

#### 3.1. *The Value of 'Quick Fixes' in Competitive Environments*

Ingenious creativity was initially contrasted with more exhaustive or unbounded creative approaches, from which it follows that situations in which one is unable to exhaust creative possibilities will also be those requiring ingenuity. I propose that I-creativity will often be valued because the solutions derived may be 'more economical' not just with materials (as seemed to be the RSA's emphasis) but, in particular, with time. Many of our practical concerns, particularly in competitive environments, typically *do* have time constraints built in. Thus the value we place on less time-consuming creative solutions (such as those that utilize immediately available materials) should be understandable.

The RSA recognize that Britain is currently facing one particular form of duress in the shape of the increasing demand for austerity and sustainability in production and development. They argue that such circumstances prompt a particular need for people to develop the capacity for ingenuity (Young 2011: 37). While important, one should not overlook the fact that this is a *contingent* circumstance reflecting factors such as a weak economy, aspirations for a 'Big Society,' and particularly urgent environmental fears. In the absence of these circumstances there is no obvious value to creative solutions that utilize immediately available resources over creative solutions of other kinds. But we can add to the suggestion that most practical problems do *in fact* involve time-constraints, the realisation that many creative and productive environments, whatever the state of the economy, or availability of resources, are non-contingently *competitive* in such a way that being first past the post is hugely important. More often than not, teams and individuals will be labouring for a creative solution under the duress of implicit time constraints (even if that constraint is only specifiable as the requirement of getting there *before anyone else*). And this, I suggest, makes a prominent claim

for the value and prevalence of I-creativity as a subclass of creative problem solving.

One caveat to this identification of I-creativity as typically ‘quick’ creative problem solving is as follows: while we often appear to value I-creativity because of its speed in generating creative solutions, I earlier noted that to avoid accusations of fortuity, I-creativity must be a matter of skill, and skills often take *time* to acquire. While I stress that I-creativity needn’t be quick, nor need this constitute the sole explanation of its value, there are at least two further potential responses to this issue, each of which I am sympathetic towards. Firstly, one might concede that I-creativity is not always quick in absolute terms, but – relative to more exhaustive approaches – is often at least quicker than less bounded forms of creativity; and valued for this reason. Secondly, one might claim that the relevant ‘quick’ creativity in these sporting examples is exhibited in the player’s capacity to react quickly to a given situation by electing to deploy a move developed in training as a response to the problem encountered at this point in the game.

### 3.2. *The Value of Risk-taking*

Many problems involve the imposition of implicit or explicit time constraints such that even if unbounded investigation of a conceptual space might appear to yield a solution, part of the problem might be thought to involve reaching a solution without recourse to such time-consuming means. Often in such circumstances one cannot be exhaustive, one cannot fully experiment or test various hypotheses but must just ‘go for it.’ This reveals that *risk* is involved in ingenuity in a special sense. I suggest that the relationship between creativity and risk constitutes a candidate for understanding another respect in which some forms of creative problem solving can be more valuable than others.

In any creative endeavor (including those that constitute ingenuity) there will be risk of failure in the sense that it is possible that no viable solution will be discovered, or discovered in time to be practically valuable. But I suggest that with ingenious creativity the solution one elects to put into practice will carry with it some palpable risk of failure. This is particularly clear in cases in which a creative solution involves using materials for something other than their standard functions. In the NASA case, for example, the creative solution arrived at involved relying on (rather than being assured of) the adequacy of the duct-tape as a means of holding the contrived device together. With ingenuity, it seems, one always acts with one’s fingers crossed!

Earlier I developed the suggestion that ingenuity seems to be, in part, a valuable capacity to mediate a conceptual space, identifying and engaging with problems that require or would benefit from creative solutions (as well as an ability to derive such solutions). To this one can add that it also involves some capacity to identify or conceive of those problems for which something risky, minimally satisfactory, but also quick will constitute an adequate solution. In other words, I-creativity involves the ability to recognize and pursue the payoffs of a particular kind of risk.

There are plenty of environments where this ability would be valuable. Sport constitutes one such domain; some (perhaps all) commercial and business environments constitute others. In brief, ingenuity constitutes an important sub-class of creative problem solving because many domains in which this is valued are *competitive*. Often, being first past the post with something satisfactorily creative is considered to be more valuable to a company, individual, or team than spending a lot of time and money exhausting and testing possibilities at the research and development stage. Risk-taking is thought to be warranted where it opens up a chance of generating substantial pay-offs, and one concern that might recommend the risk-taking involved in the ‘quick-creativity’ of ingenuity is that the alternatives might be (a) that a competitor will get their first, or (b) while working more slowly and confidently on some problem it, meanwhile, evolves into something new to which the work one has undertaken has little or no application. Rather than emphasizing the present climate of austerity and sustainability, I suggest the particular values of ingenuity as a form of creativity may be more accurately reflected in its potential role as a form of creative problem solving that thrives in *competitive* environments. We might question whether or not these are values we *should* encourage in the wider domain of creative activity, but this is a debate for another day.

### 3.3. *Redefining I-creativity*

In relation to these suggestions, it can be seen that – along with disputes about the nature of the starting problem – a further explanation of the more pejorative judgments regarding some acts of ingenuity will be that these constitute expressions of some aversion to one or more of the features described above. I-creativity may be valued because it involves the ability to recognize (and deliver) the potential pay-offs of more risky creative solutions. But if an individual or organization is, in general, highly risk-averse they will be unlikely to value such behavior. If there are *no* other respects in which this particular creative solution can be recognized as valuable (and I

have suggested there may be a range of such respects),<sup>7</sup> the accusation will be that the solution in question *does not* constitute genuine ingenuity.

I-creativity, then, is valuable as a particular kind of creative response to certain kinds of problem. Ingenious individuals are those capable both of identifying or conceiving of some conceptual space in terms of these kinds of problem in the first place, and of recognizing (and realizing) the particular value of the requisite creative solution. Having argued that there are a variety of ways in which creative problem solving can be bounded, and a variety of ways in which opting to engage creatively with bounded problems can be valuable, I have maintained that I-creativity may be exhibited in various contexts (such as highly competitive environments) that favor quicker, higher-risk, but thereby more valuable creative solutions. Thus my amended definition of I-creativity can be summarized as follows:

I-creativity is the capacity to discover or recognize a particular problem whose creative solution may be quicker, riskier, more economical than the solutions to other problems within the same conceptual space, but whose payoff is of sufficient value to warrant creatively engaging with this problem.

The I-creative individual is one who not only engages with, but also creatively resolves problems of this kind (where ‘creative’ resolution has been understood in terms of the combining of ideas in a way that is original, valuable, and skillful). I-creative individuals will tend to see the costs of engaging in more exhaustive, unbounded creative behaviour as outweighed by the potential payoffs delivered by more risky, quick, or economical creative solutions.

### 3.4. *Highly Ingenious Individuals?*

I have suggested that I-creative ability may be enhanced via the development of more general capacities for problem construction and identification, yet the above definition is such that I-creativity needn’t involve the capacity to *discover* new problems within some conceptual space. The NASA engineers were forced to be I-creative (if they were to be creative at all) by having a specific problem thrust upon them. Nonetheless, in engaging creatively with that problem – recognizing it as a problem that, if solved creatively, would be of life-saving value – they demonstrated ingenuity because they could have conceived of the problem differently. They could, for example, have concluded that the Apollo 13 astronauts were doomed; con-

<sup>7</sup> Including, perhaps, the parent’s recognition that the child’s hasty act of ‘tidying’ demonstrated a capacity for ingenuity that is otherwise admirable in and of itself.



ceiving of the problem they were faced with as one of ensuring nothing like this should happen again. Still, I include (disjunctively) within this amended definition the capacity to *discover* problems of a certain kind because I suggest this reveals a further respect in which capacities for I-creativity may be valuable. As I will briefly illustrate in closing, this respect appears to have implications for the identification of *highly* ingenious individuals. The motor company Honda pride themselves on being a creative and highly efficient organization. This company demonstrates a high degree of ingenuity in their capacity to see (and creatively resolve) problems that others might not notice. For instance, Honda are one of the largest importers of soy-beans from the United States as a result of having recognised *as a problem* the fact that after having exported their vehicles they were paying to ship back empty crates. Once identified, the creative solution to this new problem was to find a new product to import, but also involved branching out into a whole new soybean division of the company. Honda appears to be creative in terms of problem-identification and in terms of problem-solving. Both abilities, I suggest, would constitute valuable attributes of ingenious individuals. In short, highly I-creative individuals seem to demonstrate a valuable capacity not just for creative problem solving, but also for identifying the best, or better, problems to solve creatively – a capacity that can itself be creative.<sup>8</sup>

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