
Aristotle's Formal Identity of Intellect and Object: A Solution to the Problem of Modal Epistemology

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Abstract

In *De Anima* Book III, Aristotle subscribed to a theory of *formal identity* between the human mind and the extra-mental objects of our understanding. This has been one of the most controversial features of Aristotelian metaphysics of the mind. I offer here a defense of the Formal Identity Thesis, based on specifically epistemological arguments about our knowledge of necessary or essential truths.

Keywords: modal epistemology, formal identity, essence, necessity

1. Introduction

Rather than speaking in terms of *a priori* vs. *a posteriori* knowledge, I will speak of knowledge of necessity (*de necessario*) and knowledge of contingency (*de contingente*). The epistemological problem I will focus on concerns what I call the Veil of Contingency. There is a gap between the set of contingent truths (available in sense perception, memory, and testimony) and the set of necessary truths. The contingent truths about the actual world under-determine the necessary truths, including necessary truths of mathematics, science, and ethics.

For Aristotelians, the class of necessary truths and the class of truths that are somehow grounded by essences are identical (see Fine 1994). All necessary truths are essential truths or are grounded in

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essential truths, and all essential truths and all truths grounded in essence are necessary. For similar reasons, the necessary and the 'universal' are coterminous. What is universal is necessary, and what is necessary is universal. Merely accidental generalizations do not count as 'universal' in the relevant sense.

For Aristotelians, it is abstraction by the active intellect that gives us access to essence, and thereby to *de necessario* knowledge. When the intellect gains access to a form, that form is 'in' the intellect. That is, each concept of an essence is a form, a form belonging to an individual mind and of the same kind as (conspecific with) forms occurring outside the mind in nature. There is a direct causal relation of some kind (I will argue, a *formal* causal connection) between these internal form and acts of understanding and of judgment by the individual human being. Aquinas and those scholastics who follow him call these internal forms the 'intelligible species'. According to what I am calling the Formal Identity Thesis, the intelligible species is literally conspecific with the substances or accidents in nature being understood. This thesis is explicitly and notoriously propounded by Aristotle in Book 3 of *De Anima*:

Now as to that part of the soul by which it has both cognition and understanding... it must be something unaffected which yet receives the form and is potentially of the same kind as its object but not the same particular... (Book 3, chapter 4)

And indeed, there is an intellect characterized by the capacity to become all things, and an intellect characterized by that to bring all things about, and to bring them about in just the way that a state, like light, does. (For in a way, light also makes things that are potentially colours colours in actuality.) (Book 3, chapter 5)

I will argue in section 2 that some reification of form is necessary to ground our knowledge of possibility and necessity (modal knowledge). Then, in section 3, I offer an Aristotelian account of our modal knowledge, in terms of the formal identity of the intellect with its object. I criticize three alternative interpretations of the Formal Identity Thesis as found in Thomas Aquinas in section 4, concluding with objections in section 5.

2. Modal Knowledge: The Need for a Connection

There must be a connection between our understanding of essences and forms, on the one hand, and our knowledge of necessary truths, on the

other. Our knowledge of necessities is, with one exception, based upon our understanding of the essences involved. (The one exception is that we can infer the necessary existence of a first cause, without grasping its essence.) Yves Simon describes this connection between essences and necessities:

Consider theoretical science. To the extent that it achieves its ideal, it moves beyond the existential data to concern itself with general types and intelligible laws, or, in other words, with formulae of possibility, with essential necessities. Unsupported by rational analysis, empirical hypotheses derived from factual observations represent an incomplete kind of knowing, indeed, a partial defeat of science. The perfection of theoretical knowledge depends above all on the necessity of its object. Thus, every time we manage to abstract from experience to reach a necessary object, our understanding, though bearing now on an object separated from existence, is more perfect than our experimental knowledge, which bears on physical existence alone. (Simon 1990: 86)

I offer here three arguments for the claim that there must be some connection (either causal or metaphysical) between our modal judgments and the essential facts. In the first, I argue that the formal identity thesis is the best explanation for the reliability of our judgments about essences. The second is a transcendental argument, with an appeal to something analogous to a causal constraint on knowledge. The third is an argument from the absence of defeaters. In this section I draw extensively from a chapter in a recent book (Koons 2018).

2.1 Argument to the Best Explanation for the Reliability of Modal Judgments

Unless we are total modal skeptics, we must believe that we are, at least in some cases, reliable in the modal judgments that we form. This reliability cannot be explained entirely by the reliability of sense perception, sensory memory, or eyewitness testimony, since all of these sources give us information only about the categorical facts of the actual world: that is, about which forms (or properties) are actually co-instantiated and which are not. Any theory about necessary connections between forms is radically under-determined by any body of truths about actual co-instantiation. No sensory information or extension of sensory information can enable us to distinguish reliably between accidental generalizations and necessary connections.

Is an Explanation Needed?

David Lewis (1986: 114–5) argued that there is no need to explain the reliability of beliefs whose contents are necessarily true, since there is no principled way to evaluate counterfactual conditionals of the form: if p (the necessary truth) were false, we wouldn't have believed it. (On Lewis's semantics for the conditional, such 'counterpossible' conditionals are all vacuously true.) There are several cogent objections to Lewis's position. First, reliability requires more than just sensitivity to falsity (the property corresponding to Lewis's conditional). We also want safety: in any nearby world in which p is true (i.e., in any nearby world), we would still believe p (or something very close to it). Second, as Joshua Schechter (2010: 444) points out, it is primarily methods or faculties that we evaluate for reliability, not individual beliefs. It certainly makes sense to ask whether the faculties that generate beliefs intuitively do so in such a way as to generate predominantly true beliefs. Third, we can sometimes interpret counterpossible conditionals non-vacuously, so long as some necessary truths (the ones negated in the antecedents of the conditionals) can be explanatorily prior to contingent facts. Consider a conditional like the following one:

- (1) If half of all possible poker hands contained four of a kind, such hands would be much more likely than they are.

Finally, as Schechter (2010: 447) also points out, explanation is not closed under necessary (or even logical entailment). Even if we explain why we have the modal beliefs we do, and even if it is necessary that those beliefs all be true, it doesn't follow that we've explained why the categories of modal propositions we believe and true modal propositions coincide. We need to explain why, among all the possible capacities we might have had, we've ended with one with the feature of *reliability with respect to truth*.

An Aristotelian Model: First Draft

What sort of capacity could explain this reliability? I will sketch a model that would do the job. Suppose that every essence has a mental counterpart. Let's say that a mental world M is a structure that can be presented in thought, in which there are n nodes which are characterized by a set of monadic and relational properties. We can define such a mental world mathematically as a set of nodes N , a set N^*

of m -tuples (with $m = 0, 1, 2$, etc.) of members of N , and an assignment function A that assigns a non-empty set of properties to each member of N^* . So, $M = \langle N, N^*, A \rangle$. Let's say that a real-world situation S consists of a set of particular substances O , a set O^* of m -tuples of members of O , and an assignment function A that assigns a non-empty set of properties to each member of O^* .

A mental model $\langle N, N^*, A \rangle$ is a counterpart of a real-world situation $\langle O, O^*, B \rangle$ if and only if there is a one-to-one function $f: O \rightarrow N$ such that:

- (i) an m -tuple $\langle o_1, o_2, \dots, o_m \rangle$ belongs to O^* if and only if $\langle f(o_1), f(o_2), \dots, f(o_m) \rangle$ belongs to N^* , and
- (ii) if an m -ary property p belongs to $B(\langle o_1, o_2, \dots, o_m \rangle)$, then there is a mental counterpart m -ary property p' that belongs to $A(\langle f(o_1), f(o_2), \dots, f(o_m) \rangle)$.

The first version of the Aristotelian model posits that the counterpart relation has the following property:

Modal Revelation. A situation S is metaphysically possible if and only if human beings who understand the relevant essences possess the power to construct (at will) some mental counterpart of S .

Modal Revelation entails that we have the power to combine (at will) any finite plurality of understood essences that are compatible, while being unable to combine essences that are incompatible. Then, if the essences in class C are compatible, I can reliably come to know it by combining them. If they are incompatible, I can reliably come to know it by trying to combine them and failing. We obviously lack such near-omnipotent power with respect to forms as actually informing matter. We might lack the causal power needed to produce a combination that is in fact compatible with the essences involved. However, we must have such power with respect to the performing of thought experiments, in which we combine or fail to combine mental counterparts of the relevant forms in thought.

I will assume, as part of the first draft of the Aristotelian model, that a mental counterpart of a property is never identical to that property: i.e., that no property is a counterpart of itself. On that assumption, the reliability of our modal knowledge depends on two further assumptions: (1) the existence, for some relevant class of real-world properties, of mental counterpart properties that satisfy Modal Revelation, and (2) our ability reliably to use a true counterpart of real-world essence whenever investigating its modal properties.

Both of these further assumptions are somewhat problematic. It would require either a remarkable coincidence or a vast plenitude

of mental properties to ensure that a true counterpart exists for any interesting set of real-world properties. Even more significantly, it would seem that the first draft of the Aristotelian model cannot provide a non-circular explanation of the reliability of our modal judgments, since it seems that we would have to be reliable in our modal judgments in order to recognize that we had succeeded in obtaining a mental counterpart for the real-world essence whose modal profile we are investigating. If we lacked such reliable judgments, it would require a second remarkable coincidence for each real-world property to have the unexplained power to produce a mental counterpart satisfying Modal Revelation in human investigators.

The Aristotelian Model: Second Draft

We can avoid these problematic assumptions by simplifying the first draft. Instead of assuming that each real-world essence has a mental counterpart distinct from itself, we shall assume that every essence is *its own* mental counterpart, satisfying Modal Revelation. On the second draft of the model, this is taken to be a fundamental metaphysical postulate. It provides the simplest possible theory of the counterpart relation: two properties are counterparts if and only if they are identical. And it posits a unified, relatively simple capacity to the human mind: the capacity to build mental worlds with real-world properties, thereby revealing the modal properties of those same properties through thought experimentation.¹

In this second draft of the model, our thought experiments involve mental objects that instantiate the very essences whose modal properties are being investigated. The model posits a *mental experimental act* with an internal structure of nodes (each representing a material particular), with each node actually instantiating some plurality of forms (substantial or accidental). A mental act with this structure is performable (at will) if and only if the corresponding structure is compatible with the essences involved (i.e., is metaphysically possible).

The second model explains our reliability with respect to essences that we understand, and it explains that reliability in a way involving a real connection to the essences in question, via forms that really instantiate those essences within a mental experimental act. This model incorporates Aristotle's Formal Identity thesis as an indispensable component. Without it, we would be left with no explanation of

why our thought experiments reliably track the modal features of essences.

Sensory Knowledge and Imagination cannot Fill the Gap

Can sensory knowledge alone provide us with the connection that is needed for this knowledge of necessity? No, since sensory knowledge can give us knowledge only of *contingent* matters of fact, and there is a Veil of Contingency lying between such matters of fact and the necessary features of the essences of the things perceived. David Hume was perhaps the first to posit such a veil explicitly, arguing that we never directly observe the 'necessary connections' between matters of fact, but this deficiency of the power sensory perception was already an implicit element in the Aristotelian and scholastic traditions. We can only perceive directly the proper sensibles of each of our five senses (i.e., colors, sounds, smells, tastes, and tactile qualities). Even when the common sense is included, our sensory knowledge is limited to the actual distribution of these qualities and quantities, which always lies on the near side of the Veil of Contingency.

It is true that the sensory imagination gives us some limited access to information about what is possible or impossible. However, it is clearly at best a fallible guide to possibility, and only within a limited range of scenarios. It cannot be a source of metaphysical possibility as such, but only of possibility relative to the actual laws and natural environment of human beings. In addition, since we are concerned here about our knowledge of metaphysical *necessity*, which is wholly grounded in the relevant essences, the power of imagination by itself cannot be the source of this knowledge, since it lacks access to the essences of natural things.

In addition, there is what Aquinas terms the 'estimative' sense of animals (and the corresponding 'cogitative' power of humans), which does give them some limited access to causal necessities, i.e., what is to be sought or avoided, such as: what is edible, dangerous, desirable as a mate, and so on. But again, this does not rise to the level of general and scientific knowledge of essences. For that, the intellect must be involved. And so, there must be some direct connection between the intellect and the forms to be understood, a connection that does not depend *constitutively* on sense perception or imagination or the estimative sense and so is able to penetrate the Veil

of Contingency. I am not denying that such intellectual knowledge depends causally on prior sense experience, as a necessary but not sufficient condition.

Natural Selection Cannot Fill the Gap

Natural selection can explain the reliability of our innate or intuitive beliefs concerning the contingent facts about our physical environment. It is not implausible to suppose (as both Mišćević 2004 and Williamson 2004 have argued) that reliability with respect to *intuitive* modal beliefs is a very probable by-product of reliability with respect to beliefs with contingent contents. Mišćević points out that, at least for those necessary truths concerning the modal structure of reality, it is impossible in practice to isolate beliefs about important contingent matters (like dispositions, powers, potentialities, and propensities) from beliefs about the (necessarily true) principles of modal logic. For example, we can reliably draw the following sort of inference:

If I have the power to express a falsehood intentionally, and if expressing a falsehood intentionally metaphysically necessitates telling a lie, then I have the power to lie

This inference requires grasping a principle of modal logic, namely, the weakening of the consequent of a subjunctive conditional.

Similarly, Williamson argues that knowledge of everyday subjunctive conditionals is of great value in the struggle for existence. The operators of necessity and possibility can be defined in terms of counterfactual conditionals, in such a way that knowledge of counterfactual conditionals will ground inferential knowledge of some necessary truths. For example, a *might* conditional, like 'If we were to build a bridge of this kind from inferior materials, it might fall down', entails a proposition about metaphysical possibility: 'A bridge of this kind could fall down'. This inferential knowledge of necessary truths might constrain our modal intuitions in such a way as to ensure their having *some* measure of reliability. Such naturally selected modal intuitions do give us some insight into certain metaphysical possibilities, but they provide no reliability about metaphysical necessities.

Natural selection prefers 'quick and dirty' approximations to principled solutions. Knowledge, in contrast, must be the product of

a *per se* infallible faculty – all error must be the product of interfering factors or abnormal conditions. Compare, for example, two engineers: one who uses an approximation technique that is known to give the right answer 80% of the time, the second who uses a method that is guaranteed to give the right answer every time but who fails to apply that method correctly 25% of the time, due to distractions or confusion. The second engineer knows the exact answer 75% of the time, while the first never knows the exact answer, even though his guesses are right 80% of the time. From the point of view of knowledge, the first is a complete failure, and yet Nature would surely often prefer the first to the second.²

Conceptual Constraints Cannot Fill the Gap

Besides the direct appeal to sensory experience or natural selection, there is another approach to explaining reliability that must be considered: the operation of conceptual constraints (Law 2012). One might argue that we could not even have the concepts of possibility and necessity were our modal intuitions not mostly reliable. This could be justified on the basis of something like Davidson's (1984) principle of charity, or Williamson's principle of knowledge maximization (Williamson 2004): attribute concepts to subjects in such a way as to maximize the truth of their beliefs (Davidson) or their total stock of knowledge (Williamson).

How much reliability can we expect to result from this sort of conceptual constraint? It is hard to say exactly how much – at most, we can be confident that we will be as reliable *as absolutely necessary* for the attribution to us of the relevant concepts to be reasonable. That is a pretty low standard: we are all familiar with cases of systematic error and confusion that coexist quite happily with the undeniable possession of the relevant concepts. To possess the relevant concepts, it is sufficient to be able to apply them in a few clear cases, while being quite unreliable in general.

Can Williamson's suggestion of knowledge maximization as an interpretive standard be of help? Not really, since, as Williamson (2004: 139–140) explains, the maximization norm would lead us to attribute knowledge only in those cases in which the subjects are in appropriate causal contact to the relevant facts. This is why we are not driven to attribute knowledge of quantum mechanics, for example, to people in the Stone Age. However, when it comes to causal contact with the

facts of mathematics, morality, or ontology, we are all in the same boat as our Paleolithic ancestors were with respect to quantum phenomenon—indeed, in the absence of the Aristotelian formal-identity model, we are worse off with respect to essential facts than they were with respect to quantum mechanical ones. Our ancestors were at least in some remote causal contact with the latter since they are physical in nature, while (if the Aristotelian model is false) we are completely isolated from the former. Consequently, Williamson's knowledge maximization standard of interpretation can't by itself ensure any reliability to our intuitive beliefs of necessary truths.

2.2 *A Transcendental Argument*

My second argument is a transcendental argument, based on real connection as a necessary condition of knowledge:

1. If there were no connection, causal or constitutive, between our judgments about necessity and the corresponding facts about essences, we would have no knowledge of necessity.
2. We do have such knowledge.

Therefore, there is some connection, causal or constitutive, between our judgments of necessity and the corresponding essential facts.

Edmund Gettier's paper (1963) revealed the bankruptcy of defining knowledge in terms of justified true belief. Post-Gettier reflections on knowledge have revealed that, at least in the paradigmatic cases of perception, memory, and testimony, knowledge requires a real connection of some kind between the mental state of knowledge and the facts so known. I argued in *Realism Regained* (Koons 2000) that a similar constraint is also required for our knowledge of the laws of nature, mathematics, and logic (see also Koons 2017; 2018). John Bengson has recently made a similar argument (Bengson 2015). The key fact is that our intuitive (justified) true beliefs can also be Gettierized.

Suppose that a drug XYZ produces randomized intellectual seemings (or, if you prefer, causes our ordinary rational faculties to generate beliefs with randomized contents). When administered to a group of subjects, it is predictable that 1% end up with true intuitive beliefs, 99% with false ones. Those relying on veridical seemings (or belief-generation) under these circumstances do not gain knowledge,

although they may have justified true beliefs (assuming that they don't know about the drug and its effect).

Does this result depend in any way on contingency – that is, on the possibility of a given subject believing differently? Replace the drug with genetic manipulation of human gametes. Given origins essentialism, the 1% that end up with true beliefs might have the disposition toward those beliefs essentially. This is still not good enough for knowledge.

Would it be sufficient if the seemings or dispositions to believe were essential to one's species? I think not: just replace the preceding scenarios with one in which aliens manipulate the evolutionary history of intelligent species on 100 planets, producing reliably true beliefs in 1, mostly false beliefs in 99, with all 100 species equally adept at reproduction. The one intelligent species with species-wide essential dispositions to true belief still lack knowledge, because of the lack of a real connection between their seemings and dispositions and the relevant truths (whether those truths are themselves necessary or contingent).

The upshot of these thought experiments is this: knowledge is undermined so long as there are relevantly similar seemings or dispositions that are unreliable with respect to truth, and which had an equal or nearly equal propensity to exist.

What if it were metaphysically impossible for there to exist relevantly similar seemings that are false? I reply: Is this impossibility supposed to be true as a matter of brute necessity? It is hard to believe in such a metaphysical necessity without some ground – a ground that only a real connection can provide. And, in any case, a merely brute necessity is too accidental to provide the needed connection between beliefs and their objects. Counterpossible scenarios in which the brute necessity was violated would be epistemologically relevant.

2.3 *An Argument from the Absence of Defeaters*

The theory of defeaters, as developed by John Pollock (1987), Alvin Plantinga (1995), and Michael Bergmann (2005), has supposed that defeaters are beliefs of a certain kind: beliefs whose presence in the mind undermines some other belief's warrant, justification or reasonableness (in the same mind). Let's call this a *subjective* account of defeaters, in the sense that the defeater is always some state of the

subject whose belief is defeated. Jonathan Kvanvig (2007) has argued for an alternative, objective account, on which defeaters are true propositions that stand in a defeating relation to some epistemic relation (like being support or evidence for) between two other propositions or sets of propositions. Jonathan Dancy's work on practical reasons as facts or actual states of affairs to which a rational agent is sensitive or responsive could also be adapted to an objective theory of defeat (Dancy 2000).

On Dancy's view, a *reason* for *S* to believe *p* is some actual state of affairs that favors *S*'s believing *p*. We can extend Dancy's picture to *undercutting defeaters* (to use the term from Pollock 1987). An *undercutting defeater* of *R* as a reason for *S* to believe *p* is a state of affairs that grounds the fact that *R* is not a reason for *S* to believe *p*. An *undercutting defeater-defeater* of *D* (as a defeater of *R* as a reason for *S* to believe *p*) is a state of affairs that grounds the fact that *D* is *not* a defeater of *R* as a reason for *S* to believe *p* (see Chandler 2013). A defeater-defeater of *D* (with respect to *R* as a reason for *S* to believe that *p*) must be a state of affairs *T* for which we could have some reason to believe that *T* actually obtain that would not be defeated by *D* itself. A fact *D'* cannot defeat a defeater *D* if *D'* belongs to a set of facts that *D* renders epistemically inaccessible.

D is a *potential defeater* of *R* (as a reason for *S* to believe *p*) just in case (roughly) *D* would be, in the absence of any relevant defeater-defeaters, a defeater of *R*. *D* is a *merely potential* defeater of *R* if *D* is actually defeated.

A *rational* subject is one whose beliefs and non-beliefs are suitably sensitive to the reasons he or she is aware of (i.e., one who responds as the reasons demand). A subject *S* *knows* that *p* if and only if (roughly) *S* believes *p*, *p* is true, and *S*'s belief in *p* is suitably sensitive to the reasons for and against believing *p*. A fact *D* is a defeater of *S*'s knowledge that *p* if it is an undefeated potential defeater of *S*'s reasons for believing *p*.

1. If the Formal Identity thesis is false, there is no real connection between our modal judgments and the essences of things.
2. The absence of such a real connection is a reason to believe that the prior objective probability of any of our modal judgment's being true is low.
3. There being a reason to believe that the prior objective probability of any of our modal judgment's being true

is a defeater for that judgment. Call this defeating state of affairs L.

4. This defeater L can only be defeated by states of affairs that include some facts about the essences of things and metaphysical necessities.
5. Any reason for believing in the actual obtaining of such defeater-defeaters is itself defeated by L.
6. So, L is an undefeated defeater of our reasons for believing any of our modal judgments. (From 3–5)
7. The existence of an undefeated defeater is sufficient for a modal judgment's failing to constitute knowledge.
8. We have modal judgments that constitute knowledge.

Therefore, the Formal Identity thesis is true.

3. Human Knowledge *De Necessario*: An Aristotelian Account

Given that there must be some real connection between worldly essences and the human mind for modal and moral knowledge to be possible, we have to consider two possible connections: efficient and formal. The 'Platonist' (as we may call the first alternative) supposes that essences are mind-independent substances that interact by way of *efficient* causation with the human mind; that is, essences must have causal powers that they can exercise in producing specific mental events and conditions. The 'Aristotelian' (to give a label to the opposite view) supposes instead that there is some formal or constitutive relationship between the essences that are the objects of understanding and the acts of human understanding themselves.

One difficulty with the Platonic account is that it cannot both attribute understanding to the human mind (as an intrinsic feature of that mind) and maintain the strong, *per se* unity of the human person. Either understanding does not belong to the individual human person but to a system composed of that person and external, universal essences, or the human person itself is partly composed of external substances of a universal character. Neither option seems attractive.

Another difficulty with the Platonic account concerns the efficient-causal connection that it posits between universal Forms and individual human minds. It is hard to see how something

transcendent and universal can enter into the moment-by-moment operation of a particular thing and do so by way of efficient and not merely formal causation. Platonists are entitled to a relation of instantiation between particulars and universals, but that relation cannot explain how the human mind grasps features of a universal as such.

If human thoughts are grounded in essences of external things that are not themselves external to the mind (as the Platonists suppose), then these essences must function as *accidents* of the human mind. This means that it cannot be numerically the same form of equinity that informs both my act of understanding and yours. Instead, there must be two forms of the same kind or species (namely, equinity). Similarly, the form of equinity in my mind cannot be numerically identical to the form of equinity of any individual horse.

This Aristotelian account immediately faces a problem, noted by Brower and Brower-Toland and by Panaccio. When a form acts as a formal cause of an intellectual act of understanding, it thereby constitutes a *qualitative accident* of the intellect.³ However, suppose that the form that is understood is a substantial form or an accidental form belonging to one of the other, nonqualitative categories, such as quantity. In these cases, the same kind of form would have to act as a substantial or nonqualitative accidental form in relation to the natural instances of the species, but as a qualitative form in relation to the intellect.

And finally, the intelligible species has the being of an accident in the cognizer. (See SCG I, 46: 'Species intelligibilis in intellectu praeter essentiam eius existens esse accidentale habet') How could an essence [in the category of substance] ever have the being of an accident? (Panaccio 2001:193)

For according to this theory, concepts represent things in virtue of standing in the relation of formal sameness to them and hence, can be only "about" things that are intrinsically the same as they are. But concepts, as we have seen, are accidental forms falling in the Aristotelian category of Quality, and presumably qualities can only be intrinsically the same as other qualities. (Brower and Brower-Toland 2008: 216)

One possible answer would be that the difference lies in the way in which the forms relate to minds (as objects of understanding) and the way in which they relate to natural instances (outside of the mind). In effect, this would involve two distinct forms of formal causation, one natural and the other intentional. There are two problems with this

proposal. First, it very substantially increases the complexity of the theory. We now have really five modes of causation, material, efficient, final, and two distinct modes of formal causation. Second, as Brower and Brower-Toland point out, it isn't clear that the proposal solves the problem. If an intelligible species is always a qualitative form, how could it be of the same species as a nonqualitative form in nature? It would seem to be intrinsically different from such nonqualitative forms, and so not conspecific with them.

After all, if a quality (in this case a concept) is not in itself formally (or intrinsically) the same as any nonqualitative form, how could it suddenly become such merely by being possessed or instantiated in a special way? And what would explain its becoming formally the same as this thing rather than that? (Brower and Brower-Toland 2008: 217)

A better solution to the proposal is this: we insist that the intelligible species can be intrinsically a form of a non-qualitative sort, even though in some sense its informing of the intellect results in an intellectual 'quality' of the mind. And, we should insist that it is the very *same* relation of formal causation that relates nonqualitative forms to minds (resulting in intellectual qualities) and to natural instances (resulting in substances, quantities, and other nonqualitative entities). The nonqualitative form that is an intelligible species is a kind of qualitative accident because of the peculiar nature of the thing that it informs, namely, the intellect. The form is received in a way appropriate to the receiver: as a substance or quantity (when received by matter or a material substance), and as an intellectual quality (when received by the intellect).

The best way of thinking about this is to introduce a third entity into the picture: a qualitative *act of mental experimentation*. This act of mental experimentation is a form in the category of quality and informs the intellect in the same way that other qualities inform their subjects. The nonqualitative intelligible species would not (in my proposal) *directly* inform the intellect. Rather, it informs the act of mental experimentation, which, in turn, qualitatively informs the intellect.

We should take this one further step: recognizing the internal structure of an act of mental experimentation. This internal structure includes one or more nodes, each representing (in an abstract way) a material particular. Each intelligible species directly informs one of the nodes of an act of mental experimentation, which in turn informs the intellect.

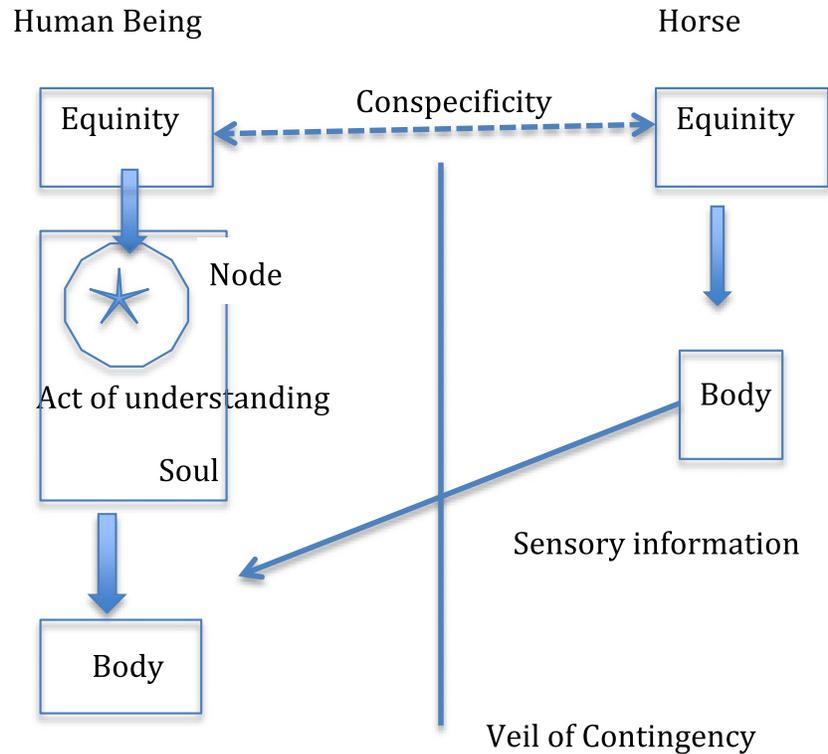


Figure 1: Conspecific Forms in Mind and Nature

This still leaves us with a problem: how can a node within an act of mental experimentation (which *ex hypothesi* is an accidental form) be conspecific with substances and nonqualitative accidents, as the Identity Thesis requires? I think the answer is pretty straightforward. An intelligible species is conspecific with some natural form if and only if the two forms are functionally interchangeable, each having, by virtue of its intrinsic character, the potentiality of doing exactly what the other does. My concept of a horse, as realized in a particular act of mental experimentation, is a form that could, if it were (*per impossibile*) informing some appropriate body of matter, be the substantial form of a real horse, just as the substantial form of any real horse could, if it were (*per impossibile*) informing some node within an act of mental experimentation in my mind, be an intelligible species of equinity in my mind. The intelligible species of equinity within my mental act is distinct from the substantial form of any given horse because of the numerical distinctness of my mental act and the body of matter of the natural horse, just as the distinctness of the substantial forms of any two horses is grounded in the distinctness of the two parcels of matter.

Aquinas seems to embrace such a theory, when he refers to the intelligible species as the 'essential quality' of the thing known. Here is Robert Schmidt's summary of the Thomistic view:

The form or species received into the intellect is at once the accidental quality of the intellect and the essential quality of the thing known... [Footnote 53 The expression "essential quality" is used *In I Perh.*, 10, n. 10. Accidental and "substantial" quality are contrasted, *In V Met.* 22, n. 1581.] It is at once the form of the intellect and of the thing known, and is therefore similar to the thing known according to its whole intelligible being. (Schmidt 1966: 110)

There is an analogy in Aristotelian thought between the way that color modifies the transparent medium and the way a form informs the intellect's act of understanding (see Burnyeat 2001). I will offer analogous interpretations of the two cases. In my interpretation of the transmission of color through the air, the form of a color modifies the quality of transparency of the air. The result is transparent air (not colored air) but with the *spiritual* or *intentional* presence of color, a spiritual accident of the air itself. The form of color belongs to the category of quality, but the spiritual accident of color is a second-order quality: a quality of a quality (in this case, a quality of the quality of transparency). When instead a form of color directly modifies the surface of a body, the result is a body with the quality of color, i.e., a colored body. Color does not modify the air in that way but only indirectly, via modifying the quality of transparency. Therefore, a spiritual change in quality does not require any change in the first-order qualities of the air, and so, as Aquinas teaches, the spiritual change in the transparent medium does not require any natural change (*In II De Anima*, Lectio 14 n418).

Since transparent air lacks any intrinsic color, the quality of transparency is a potential subject of any color whatsoever. Similarly, since the act of understanding is an immaterial act (i.e., an act only of the soul, without a corporeal organ), it is a potential subject of any material form whatsoever (that is, any form whose natural subject is material).

4. Deflationary alternatives to the Identity Thesis

That completes my defense of the Aristotelian and Thomistic doctrine of the formal identity of the intelligible species with natural forms.

In this section, I will consider three alternative interpretations of the writings of Thomas Aquinas on this point, or perhaps we should call them three *deflationary* interpretations of the Formal Identity Thesis:

1. Formal identity is just similitude, similarity (Panaccio)
2. Formal identity consists merely in causal contact with the world (Pasnau and O'Callaghan).
3. Formal identity is a primitive form of intentionality (Brower and Brower-Toland)

4.1 *Formal Identity is Just Similitude (Panaccio)*

Claude Panaccio has argued that formal identity is just similitude. If we ask *How does the nature of the thing understood exist in the mind?* Panaccio contends, 'The striking thing here is that when Aquinas wants to tackle the question, he inevitably resorts to the idea of mental similarity (similitude) as being explicative in such matters' (Panaccio 2001: 187) Panaccio cites the *Disputed Questions on Truth* I, 3: 'The intellect forming quiddities has *nothing but a similitude* of the thing existing outside the mind [Intellectus formans quidditates non habet nisi similitudinem rei existentis extra animam]' (Panaccio 2001: 193).

Panaccio argues: 'The very expression 'forming quiddities' that could make us think that the quiddities existed somehow in the mind is here entirely explained by – and hence reduced to – similitude, rather than the other way around' (Panaccio 2001: 193).

However, as Stump has argued, the relevant notion of similitude is to be understood in terms of the sharing of forms. Things can be similar in many ways: what makes an act of understanding epistemically relevant is that it shares the very same sort of form shared by the natural species being understood:

Similitudo' is cognate with 'similis' (the Latin for 'similar'); and things are similar insofar as they share qualities—or, as Aquinas would say, forms. And so, on his view, 'similitude is grounded in an agreement in or sharing of forms. Consequently, there are many kinds of similitude, corresponding to the many ways of sharing forms.' (ST I.4 a.3) See also QDV 8.8: 'There is similitude between two things insofar as there is agreement in form.' (Stump 1998: 290n5)

In addition, mere similarity is insufficient to explain the reliability of our modal knowledge. Just because our mental models involve properties that are in some way similar to real-world properties by no

means ensures the truth of Modal Revelation, and without MR, we have found no adequate explanation for our knowledge of metaphysical modalities.

4.2 Formal Identity Consists in Mere Causal Contact (Pasnau, O'Callaghan)

Robert Pasnau and John O'Callaghan have suggested that the formal identity of our concepts with extra-mental forms consists simply in their causal contact with that external world:

Aquinas's claims of a formal identity and a likeness relationship between knower and known are not just unargued assumptions in his theory of knowledge. Rather, these claims should be seen as based on causal facts about the relationship between cognitive agents and the outside world. It's because external objects make an impression on our sensory organs and (indirectly) on our higher-order faculties that those impressions, under the name 'species,' are formally identical to, and are likenesses of, external objects. Formal identity is thus guaranteed by our causal connections with the world.... In the end, formal identity is a matter of something entirely uncontroversial: that our ideas and impressions are caused from without (Pasnau 1997: 105).

O'Callaghan similarly suggests that causation alone is sufficient for the relevant kind of similitude or formal identity:

It is a general principle for St. Thomas that agents act to produce a likeness of themselves in their effects. There is a common but simplistic way of understanding this that renders it manifestly false, namely something like visual or sensual likeness... But St. Thomas does not understand it in this visual way. The character of the effect is determined by the characteristic of the cause relevant to its agency—the pitcher was shattered because the rock was solid and massive, not because it was gray.... The formal character of the effect is determined by the formal character of the cause—that is what the likeness or similitude consists in (O'Callaghan 2003: 228).

However, a causal connection is not, by itself, sufficient to explain our knowledge of the essential truths associated with natural forms, if the causal chain between the natural entities and the mind is interrupted by the Veil of Contingency. If every causal connection is mediated by merely contingent events in the realm of sensibility, then we cannot explain our knowledge of necessary truths.

We need a causal connection of some kind (including, possibly, a formal-causal connection) between those natural forms and human judgments.

O'Callaghan adds a factor that might render his account and mine compatible. He suggests that a causally generated 'likeness' grounds cognition only because of the nature of the human intellect:

So why is a likeness in a cognitive power, in particular in the intellect, a cognition? Not simply because it is a likeness as such, but because of the character of the recipient of the likeness. The effect is received in the recipient after the mode of being of the recipient, not after the mode of being of the cause or agent (O'Callaghan 2003: 231).

This is correct, so long as we take into account the effect that is produced in these cases includes the fact that the natural form stands in a relation of formal-causation to an act of understanding, a result that does not follow in all cases of efficient causation alone.

4.3 Formal Identity is Just Primitive Intentionality

Jeffrey Brower and Susan Brower-Toland have suggested that, in Aquinas's theory, the understood forms are 'present' in the intellect simply because the intellect contains a concept that represents the form. Brower and Brower-Toland propose that this representation relation is metaphysically primitive or undefinable for Aquinas. They propose, 'Whenever Aquinas speaks of the form of some object being intentionally present in the mind, we take this to mean that the form of the object in question is present in the mind via the mind's possession of a concept that represents it' (Brower and Brower-Toland 2008: 227). They cite the *Disputed Questions on Truth* 2.3 ad 9: 'The likeness can be understood as representation – and this sort of likeness is required between cognizer and cognized'.

The textual evidence for this interpretation is inconclusive, and so the hermeneutic question must turn on which proffered theory makes the most sense. I agree with Brower and Brower-Toland (and with Pasnau and others) that the problem of intentionality alone may not sufficient to take the Formal Identity theory seriously. (However, see Klima 2001a and 2001b, and Ross 2008, for impressive arguments to the contrary.) However, once we take into account the problem of knowledge *de necessario*, the need for the formal action of natures on the mind becomes clear.

What if we tried to amplify the Brower-Brower-Toland account by making the primitive intentionality relation into a formal-causal relation, of the sort that could convey information about necessary essential truths to the mind? There would be two difficulties with such a proposal. First, in terms of economy, it would require a large number of formal-causal connections for each human concept: the concept would have to be simultaneously informed by *all* the natural forms of the same species or genus, and not just by a single form located in the mind. Second, and more importantly, the proposal would run afoul of the anti-Platonic argument in section 3. The mechanisms of human understanding would no longer be entirely intrinsic to the individual human mind. Instead, the subject of understanding, the one who really understands, would comprise the human being together with all of the natural forms intended by that human's thoughts.

5. Conclusion

Does the Aristotelian model prove too much? It explains the reliability of our modal judgments, but it also seems to entail that we are infallible in such judgments. But clearly that is wrong. Even when we grasp the relevant essences, we aren't in fact infallible in inferring modal propositions from our grasp of essences.

In response, I would urge that we distinguish between the operation of a causal mechanism under optimal conditions and its operation in sub-optimal cases. For a cognitive mechanism to be knowledge-conferring, it should be infallible under optimal conditions. If we permitted knowledge with less than perfect reliability in optimal conditions, we would fall into contradiction due to the Lottery Paradox. If there are enough tickets, the probability that any given ticket is the winner approaches zero, and yet awareness of this fact never confers knowledge that this ticket will lose. Whenever a knowledge-conferring mechanism yields error, there must be some special explanation of the deviation. We are fallible in our modal judgments, but only because we often operate under sub-optimal conditions, with possible lapses in attention or memory, mishaps in exercising logical competencies, and so on.

One important source of modal error is confusion between the real essence of a natural kind and distinguishing proper accidents of that kind, which medieval philosophers and Locke called the 'nominal essence' and Hilary Putnam our 'stereotype' of the natural

kind. This explains our erroneous intuition that water (whose essence is H₂O) might not boil at 100 degrees Centigrade at one atmospheric pressure – the sort of error discussed by Saul Kripke in *Naming and Necessity*. The process of gaining knowledge about essences of natural kinds is (beyond those properties we are innately equipped to perceive) an *a posteriori* matter, but once acquired, knowledge of essences provides via thought-experiments extensive modal knowledge.

Does the Aristotelian model make it too easy to acquire modal information? No, it describes the situation at the *end* of a potentially long process of scientific investigation. It is not easy for us to grasp the essences of natural things, especially essences of substance-kinds. Where we have easiest access to essences is with respect to those real-world properties that we can perceive directly by our senses, such as certain geometrical and arithmetical properties, and properties of sensory spaces, like the space of colors or of sounds.

Notes

1. I am assuming that we exercise these powers of conception via what George Bealer (2002, 107) defines as *semantically stable* (un-Twin-Earthable) concepts. On the Aristotelian model, we conceive property in this way by simply having the property instantiated within the act of understanding, and not via any historical, deferential, or reference-fixing mechanism. This eliminates for the relevant range of cases of any Kripkean sources of modal illusion.
2. Note well that I am not saying that *we* must be infallible in order to have knowledge. We must distinguish between faculties that are intrinsically fallible (and so not knowledge-generating) from those that are intrinsically infallible but fragile – subject to external interference. The latter generate knowledge, when they are free to work properly, but they can fail, when interfered with. I'm also not assuming any kind of luminosity or KK principle, since I'm requiring infallibility only within suitable margins of error.
3. That they are accidents is explicitly stated by Aquinas in the *Summa Theologiae* Part I, Q5, article 4 and *Summa Contra Gentiles* I, 46. Yves Simon writes, 'All major Thomists are unanimous in affirming that immanent action is a quality.' (Simon, p. 66, n29) The immanent act of understanding is such an immanent action and does not fall into the Aristotelian category of *action*, since it lacks the essential properties of that category: to exist with motion, and to produce a passion in some patient.

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