Formalisation and Responsibility

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Abstract If you ask a scientist for the actual meaning of his terms – say, of an electron or a quark – he is more than likely to write an equation. An electron, he will insist, is this formula for the probability–density of its position. Similarly, if you want to evaluate an investment in finance, you use the formula for its net present value, discounting the income it generates by the opportunity costs of its capital. Such formal procedures are, in fact, omnipresent. From the algorithms determining market investments to the reduction of much of the social sciences to statistical analyses, both our claims and our decisions exhibit the formalisation that marks our age. The questions I raise concern the issue of responsibility in this context. How is it to be understood? To whom or what do we respond? I argue that our difficulties answering such questions point to the transformation of the notion of responsibility that formalism occasions. Formalisation abstracts from the embodied particularity of being, thereby abstracting from both the individual that bears responsibility and the individuals to whom he or she responds.

Keywords Formalisation • Responsibility • Cartesian rationality • Objective knowledge

If you ask a scientist for the actual meaning of his terms – say, of an electron or a quark – he is more than likely to write an equation. An electron, he will insist, is this formula for the probability–density of its position. Similarly, if you want to evaluate an investment in finance, you use the formula for its net present value, discounting the income it generates by the opportunity costs of its capital. Such formal procedures are, in fact, omnipresent. From the algorithms determining market investments to the reduction of much of the social sciences to statistical analyses, both our claims and our decisions exhibit the formalisation that seems to mark our age. The question I would like to raise concerns the question of responsibility in this context. How is it to be understood? To whom or what do we respond? During the Vietnam War, US bombing missions were set by a computer program that, based on field

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reports, calculated the probability of the Vietcong's being in a particular location at a particular time. Such missions, with their use of napalm, were responsible for the destruction of much of the countryside. Who or what was responsible for this: the computer, the writers of its algorithms, the pilots flying the missions, the operations research analysts that worked to 'rationalise' these missions? Our difficulties in answering this question point to the transformation in the notion of responsibility that formalism brings. In this paper, I am first going to discuss the rise of formalism and then speak about this transformation.

Plato and Aristotle

To understand formalisation, we must return to the original conception of the form. Plato's word for this is *eidos*, which is often translated as *idea*. He considers the ideas or forms to be supremely actual because they completely embody what it means to be, which is to be self-identical. As Plato writes, "the very essence of to be" (the *autē hē ousia. . .tou einai*) is to be "always in the same manner in relation to the same things". This is to be "unchanging" and, thus, to remain the same with oneself. The forms, he writes – "beauty itself, equality itself, and every itself" – are called "being" (*to on*) because they "do not admit of any change whatsoever" (Plato 1967: 78d, my translation). His basic insight is that change is always change of something, something that remains constant throughout the change. This means that a real loss of self-identity is not change, but rather annihilation pure and simple. To continue to be, a being must continue to have a level of identity with itself, and the form is what expresses this. Aristotle agrees. For Aristotle, however, the form is taken as informing some underlying material. The form distinguishes the material, making it be a definite thing. Viewed organically, the form is both a formal and final cause of a living thing. As a final cause, it is what the thing's organic development attempts to realise. It is, for example, the full-grown tree dropping its seeds for the next generation. As a formal cause, it can be compared to the DNA that informs the tree's growth. One can also think of it as the architect's blueprints, which the process of building realises. As a formal cause, it is present in the blueprints; as a final cause, it is present in the shape of the concrete edifice.

For both Plato and Aristotle the form is something visible. Thus, the word Plato chooses for the form, *eidos*, is derived from *eidon*, the second aorist of the verb *eidein,* which means 'to perceive'. The *eidos*, then, is the 'look' of something. Plato assumes that we can, somehow, see 'beauty itself' through beautiful objects, 'equality itself' through equal objects, and so on. For Aristotle, the visibility of the form comes from the fact that the form sets the thing's essence – in Greek, its "what it was to be".[1] Retrospectively regarded, the form for living beings is what the organism 'was to be', given its growth and pattern of development. As such, it is

[1] Aristotle's term for *essence*, which he coined, is: *to ti hēn einai*, which means literally, *what it was to be*. In Latin, it was translated as *quod quid erat esse*, which was shortened to *quiddity*.

what had to appear at the end of its natural course of development – this being, for example, the fully grown tree that is dropping the seeds for the next generation of trees. Plato and Aristotle also agree that the form is unchanging. For Aristotle, neither the formal cause nor the goal set by this changes during natural development. As designating a thing's underlying self-identity, Plato's *eidos* is also unchanging. Finally, they both take the form or *eidos* as the reality of a thing. It is what gives an entity its being as something definite.

To speak of responsibility in this context is to take it as responsibility to the form. For Plato, this is our responsibility to our underlying self-identity as human beings. As Socrates advises Callicles in the *Gorgias*, Callicles's very selfhood is at issue in their debate about the proper life to lead. Failure to engage in it means that Callicles "will remain at variance with himself his whole life long". As for himself, Socrates adds, "it would be better for me…that the mass of mankind should disagree with me and contradict me than that I, a single individual, should be out of harmony with myself and contradict myself" (Plato 1971: 76). Aristotle, in his *Nicomachean Ethics,* agrees with this. The point of a moral life is to find pleasure in the proper things. We all follow pleasure, and pleasures increase the activities we engage in. The bad man, however, finds that his pleasures contradict each other. They lead him to conflicting goals and thus to act at cross-purposes with himself. Ultimately, then, they undermine the activities that actualise 'what he was to be' as a human being. To be a moral human being is to discover this and to respond to it.

Descartes

With Descartes, we enter a very different world; one where the form is replaced by the formula. As a mathematician, Descartes is famous for having invented analytic geometry. Expressing the various conic figures as algebraic formulae, he shows how easy it is to algebraically prove the propositions Euclid so laboriously demonstrated. For Euclid, a circle was a definite shape; namely a figure enclosed by a single line, where all the lines from a point within the figure meeting this single line can be equal.[2] In analytic geometry, by contrast, the circle is a formula relating five variables: two for the coordinates of its centre, two for the coordinates of a point on its circumference, and one for the distance between these two points. If we regarded only this formula, we would not know that it referred to a circle. In fact, reference to a visual figure is not at all required in the algebraic manipulations that prove its various properties.

Descartes, of course, is also famous for using his mathematics to express physical laws; for example, that of the conservation of momentum. To see how the formulae he uses come to be taken as the reality of the processes they express, we have to turn to his *Meditations*, with its deep mistrust of his senses. Descartes

[2] See Euclid, *Elements*, Book I, definition 15.

writes there that he sees "nothing to make it impossible that I was so constructed by nature that I should be mistaken even in the things which seem to me most true" (Descartes 1990: 73). Thus, it seems most true "that in an object which is hot there is some quality similar to my idea of heat; that in a white, or black, or green object there is the same whiteness, or blackness, or greenness which I perceive; that in a bitter or sweet object there is the same taste or the same flavor, and so on for the other senses" (Descartes 1990: 77). None of this, however, is true. These apparent qualities have their origin, not in the objects apprehended, but in the peculiar structure of our human senses. The purpose of these senses, however, is not truth, but rather survival. In Descartes's words, his bodily senses are there "only to indicate to my mind which objects are useful or harmful" to his embodied state (Descartes 1990: 79). As such, the information they provide is strictly relative to it. The question this leaves him with is: how can we get beyond this relativity to apprehend what pertains to the objects themselves?

The answer Descartes arrives at gives the formula the same ontological force that the form had for Plato and Aristotle. It makes it the reality of the processes and objects it expresses. According to Descartes, "everything which I conceive clearly and distinctly as occurring in [corporal objects] – that is to say, everything, generally speaking, which is discussed in pure mathematics or geometry – does in truth occur in them" (Descartes 1990: 76). This means that we can overcome the relativity of our senses by focusing on the numerable qualities of bodies. All our senses have to do is to provide us with countable objects. Thus, no matter what my senses are, as long as they allow me to distinguish elements, I can number them. What I do number pertains to the objects themselves; so do the formulae relating what I number.

One way to put this position is in terms of the distinction between primary and secondary qualities. The primary qualities of bodies are their numerically measurable aspects. As measurable, they have what can be called a 'third-person' objectivity. Thus, given common units of measurement, everyone can agree on the dimensions of an object, its velocity, mass, temperature, and so on. Moreover, the mathematically describable relations of causality, such as the familiar 'force equals mass times acceleration', can apply to such qualities. Secondary qualities, by contrast, consist of the tastes, textures, colours, smells and sounds of the world. They are the aspects that our senses convey. They are as private and subjective as the flesh that embodies us. Just as no one can eat for you, sleep for you or perform any of a host of bodily functions for you, so they also cannot taste, touch, smell, hear or see for you. What one reports in this area is not objective, but irremediably 'first-person' and subjective.

Since these sensuous qualities are not numerable, we cannot apply the mathematical formulae of causality directly to them. To relate them to reality one must link them to what can be numbered. For Descartes, this involves a translation of the changes in the sensuous qualities of bodies – their "colors, odors, tastes, sounds, heat, hardness, and so on" – into the "corresponding variations" in their numerical aspects. Thus, for a Cartesian, a change in sound is translated into a change in the numerical frequency of the sound wave. Of course, the change in the sound wave is

actually quite different from the change in heard sound, which is experienced as a change in pitch. As Descartes admits, "these variations are not really similar to the perceptions" (Descartes 1990: 77). This, however, is to be expected. It is a function of our proceeding beyond what is specific to our embodied sensibility, to what pertains to the object in itself. This consists of its numerical aspects. More precisely, it consists of the formulae relating these aspects as the object interacts with other objects.

Consequences of Cartesianism

Descartes's method has a number of important consequences. There is, first of all, its transformation of what we understand by the observing and judging subject. Since all that is required of the observer is the ability to count and measure, each properly trained observer is replaceable by any other who possesses the proper measuring devices. Counting, according to Descartes, proceeds by an "inspection by the mind" that abstracts from the special qualities of our bodily senses.[3] This abstraction from our embodied individuality, which is the hallmark of scientific observation, enacts on a practical level Descartes's famous separation of the mind from the body. The same holds for the judgments that relate what we measure through mathematical formulae. Since none of the features that specify our embodiment, be they those of our race, gender, birth or personal history, enter into such judgments, they too evince the subject's separation from the embodiment that particularises him. Stripped of their particularity, subjects become mutually replaceable.

A concrete expression of such replaceability occurs in the formalisation of business and administrative systems. Formalisation, in this context, is measured by the degree that rules and procedures are followed by members of an organisation. The higher the degree of formalisation, the more their activities are specified by such rules. On the one hand, the result is an increase in the 'rationalisation' of procedures. They become standardised and, hence, highly predictable. Such predictability increases the organisation's ability to monitor and, hence, control its members. On the other hand, the result is the ease in replacing an employee by an equivalently trained individual. Formal structures are norms and behaviours that exist regardless of who performs them. Following them, the employee's functions become so routine and regular that he is easily replaced without disturbing the organisation's functioning.

The same evacuation of the individual is found in the most disparate of domains. The public space defined by Cartesian rationality, for example, also ignores the particularities of embodiment. It, too, becomes abstract and universal. It substitutes

[3] The phrase is used by Descartes to describe the apprehension of a piece of wax, all of whose sensuous qualities change as it is heated. (Descartes 1990: 30–31).

the view from nowhere for the particular gaze of the embodied individual. The emptiness of certain forms of modern architecture, with their utilitarian geometry, absence of detail and lack of points of orientation exemplifies this space. Broadly speaking, what such space exhibits is the replacement of the 'first-person', subjectively oriented viewpoint by the impersonal 'third-person', objective perspective. The same procedure appears in analytic philosophy, with its linguistic turn. Those who take this turn assert that the basic task of philosophy is to analyse the structure of thought, sharply distinguishing this from our private and subjective acts of thinking. Rather than engaging in any first-person analysis, they assert that the only way to analyse the structure of thinking is by analysing its linguistic expression. For them, the philosophy of language *is* the foundation of philosophy.[4] Formalisation does not appear only in this linguistic turn. It also shows itself in analytic philosophy's preference for substituting letters for references and employing logical formulae to state its propositions. Such philosophy is not unique in this: a similar turn to the 'third-person' perspective – a similar preference for the use of formulae to express conclusions – appears in almost all of the social sciences. They, too, take the 'hard' sciences – i.e. the sciences, like physics, that strictly follow the Cartesian procedure – as their model.

The most striking consequence of this turn to the 'third-person' perspective is the devaluation of consciousness. Consciousness, considered as the concrete tissue of our subjective experience, is not numerable. As such, it has the same ontological status as the secondary qualities provided by our senses. It has to be reduced to the measurable primary qualities of the world. Daniel Dennett, an analytic philosopher of mind, gives a version of this view when he writes that such secondary qualities or "qualia" are "mere complexes of mechanically accomplished dispositions to react" (Dennett 1991: 386). He adds: "A philosopher's zombie, you will recall, is behaviorally indistinguishable from a normal human being, but is not conscious" (Dennett 1991: 405). Drawing the obvious conclusion, he writes: "We're all zombies. Nobody is conscious" (Dennett 1991: 406). We cannot be, given the irreality of the elements composing consciousness.

To see why formalisation inevitably leads to this conclusion, we can turn to Kant's distinction between inner and outer sense. According to Kant, "Time cannot be outwardly intuited, any more than space can be intuited as something in us" (Kant 2001: B37, my translation). Thus, when I outwardly regard the world, it is always now. I cannot sensuously see the future nor view the past. To grasp the past or the future, I have to turn inward and remember or anticipate. Similarly, when I inwardly regard my own consciousness, space disappears. It is impossible for me to assign a definite size to my inner representation of a given object. The representation occupies more or less of my visual field depending upon my external spatial distance from this object. Given this, we have to say that the external world presented by outer sense has no time and the internal world that we access through

[4] These formulations occur in Han-Johann Glock's online review of Michael Dummett's *The Nature and Future of Philosophy* (Glock 2012).

reflection has no measurable space. The third-person perspective that focuses on the outer world thus drains time from what it regards. As such, it cannot but abstract from consciousness. A sign of this appears in the mathematical and logical formulae that science employs. Such formulae can include time as a variable, but the relations they specify are instantaneous. To take the simplest example: to find out how far one has travelled, one can employ the formula, 'distance equals velocity times time'. Thus, having travelled at 100 km per hour for 1 h, the formula predicts that one will have travelled 100 km. One can work this formula for any time one chooses. Yet at whatever time one does choose, it presents a snapshot. It presents the way the world will be outwardly intuited at that point. In limiting us to a given 'now-point', it does not just drain time from the world, it also excludes the consciousness that subjectively regards it. This conclusion should not surprise us. The exclusion of consciousness was already implicit in the atemporal nature of the form in Plato and Aristotle. Whenever either philosopher talked about the soul's contemplative regard of such forms, he assumed that the soul, at the moment of such regard, escaped from time. But this escape is its loss of what makes it a particular consciousness.

Critiques of Formalisation

As Husserl and Patočka point out, this shift in the weight of being from the secondary to the primary qualities involves an ontologisation of the idealities of mathematics. When we take our mathematical formulae as the reality of the processes they describe, we forget, as Husserl writes, that "mathematical-physical nature. . .the nature of the exact natural sciences is not the nature that we actually experience". What we actually experience is the nature "of the life-world", the world of our immediate, first-person experiences. The nature of the exact sciences is, by contrast, "a hypothetical idea arising from idealization, one substituted for the actually viewed nature" (Husserl 1954: 224). Essentially, the error here is that of substituting the description for the thing described. Just as the law of gravitation is not the gravitating bodies whose relations it describes, so a mathematical relation is not itself the things it relates. Thus, Newton's law for the force between two bodies, $F = \gamma m_1 m_2 / d^2$, when solved, gives us a number. Force, however, is not itself a number: it is what is numbered.

Beyond this, the elimination of consciousness by science undermines its own results: they lose their experiential, empirical basis. This point can be put in terms of Cartesian doubt. Descartes, as I cited him above, doubts "that in an object which is hot there is some quality similar to my idea of heat; that in a white, or black, or green object there is the same whiteness, or blackness, or greenness which I perceive; that in a bitter or sweet object there is the same taste or the same flavor, and so on for the other senses". Strictly speaking, this doubt concerns the referents of his experiences. He doubts whether anything corresponds to them. He does not,

however, doubt that he has such experiences. Were a scientist to doubt the reality of his experience, he would rob his science of any empirical basis.

Why, then, do we assert that what is real are the referents rather than our experiences of them? As Heidegger and Patočka point out, the answer can be found in the fact that such referents, when reduced to their primary qualities, permit description in mathematical, causal terms. The causal relations we draw regarding them allow us to predict and, hence, control the interactions of the objects referred to. The focus, here, is on power. Power is the sign of reality: I take my ability to causally manipulate things as a sign that I grasp them as they 'really' are. Correspondingly, I grasp myself in terms of this exercise of power. If we turn this into a metaphysics of the will, then according to Patočka, we do not just assume "the thoroughgoing predictability and control of beings"; we also take the will "as the will that wills itself" in predicting and controlling beings. Its ultimate goal is our ability to predict and control. It wills the will that does this. All this reflects on the status of the will itself. Through its willing our technical manipulations, the will makes things come to be and, hence, appear. Metaphysically regarded, according to Patočka, it takes up the position of "the being of beings" and "the ground of appearing".[5]

Responsibility

What is responsibility in this context? What can such a subject be said to respond to as "the will that wills itself"? If we speak of responsibility in the context of formalisation, then the most we can affirm is responsibility to the formal procedures of a given area. In science, this is a responsibility to proceed according to the scientific method. In the business and administrative context, the responsibility is to the rules that govern the relations in the organisation. One follows the procedures set down for one. Enacting them, one acts 'professionally'. Parallel examples can be drawn from widely dispersed areas. One can speak of responsibility to the rules of the marketplace, to those of a news organisation, and so on. What is missing here is responsibility to the other person as a singular individual: this is the individual

[5] As Patočka expresses this: "Ist aber der Wille als Sein des Seienden gefaßt, und allem zuvor als der Wille, der sich selber will, dann: ist man heillos jener Identifikation verfallen, die sich in der durchgängigen Berechenbarkeit und Beherrschbarkeit des Seienden äußert und keine andere Art des Verhaltens zum Seienden kennt. Ist dem so, dann wundert man sich nicht mehr, das Wesen der technischen Welt bei Denkern ausgesprochen zu finden, welche ihr auf den ersten Blick fern stehen; das Wesen der Technik kann nur und muß nämlich metaphysisch ausgedrückt werden. Ja, die technische Welt treibt diese metaphysische Identifikation und die Vergessenheit der Differenz sogar auf die Spitze. Zugleich damit muß der Mensch der technischen Epoche sich selbst als den tiefen Ursprung, als Grund der Erscheinung, als den Willen, der sich selber will und als Subjektivität in diesem Sinne absolut setzt, auffassen: Die Umkehrung der Metaphysik, welche mit Weltverdopplung anfing, um in der Verneinung aller Jenseitigkeiten zu gipfeln, ist selbst die letzte und höchste Gestalt der Metaphysik" (Patočka 1991: 335–336).

particularised by his or her embodiment. Having abstracted from this embodiment, Cartesian rationality has no place for it. As I have noted, the point of the formal procedures it relies on is to make all observers equivalent. Properly speaking, there are no others once we abstract them from the embodiment that particularises them. What we are left with is only an abstract 'ideal' observer.

This lack of genuine others does not just pose difficulties for the conception of objective knowledge – which is supposed to be the same for myself *and my others*. It also affects how we respond to the world. To respond is to reply – as in responding to a question. The basic question put to us by the world is: why are things the way they are? Why, in other words, do things show themselves this way rather than another way? What we are asking for here is a reason for the way things are. Now, to raise this question, we must see them as capable of being another way; that is, as not necessarily being the way that they presently show themselves. Where does this sense of their contingency come from? It comes, I believe, from different points of view; from the alternative perspectives we encounter that call our own into question. Such perspectives are those of our embodied others. Their very embodiment gives them that irremediable alterity that marks the first-person apprehension of the world. Such alterity indicates that the world we apprehend through our actions and interpretations could have been other. When our apprehensions and interpretations are confronted with those of another person, both lose their sense of being inherently necessary. With the sense of their contingency comes the question: why?

This question is behind the Cartesian doubt of our embodied sensibility. Descartes asks why we see the world as we do and not some other way. What prompts such a question are our others and their different ways of seeing it. The embodied sensibility that lies behind this difference thus becomes the focus of Descartes's doubt. As such, it lies at the basis of the procedures that lead to the formalisations that mark our present age. Only by forgetting the embodiment that prompts this question can we be trapped by this formalism. Viewed in this light, responsibility is responsibility to the embodied particularity that underlies our sense of contingency. This is the same embodied particularity that is required for there to be genuine others and, hence, for there to be the objective knowledge that exists through intersubjective confirmation. The questions that such particularity raises are ultimately at the basis of all responding, all responsibility; since only through such particularity do we have the alterity that calls us into question, calling us to respond. What we are called to respond to is not just the questioning of our apprehensions and interpretations; responsibility also includes the conduct, both practical and ethical, that is based on these. The respect for our embodied particularity, in both its capabilities and vulnerabilities, is something that formalisation forgets only at its peril.

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