

Counterfactuals and Non-Exceptionalism about Modal Knowledge

Abstract:

Since our capacities and methods of cognizing reality merely seem to tell us how things are but only within close limits how they could or must be, our claims to knowledge of mere possibilities and necessities raise the suspicion of exceptionalism: the capacities and methods used in developing these claims seem special compared to those involved in cognizing reality. One may be sceptical especially with regard to them, and there are doubts that they can be naturalistically explained. To avoid exceptionalism, Timothy Williamson has proposed to reduce the epistemology of modality to the epistemology of everyday counterfactuals. There are doubts that the proposal succeeds. One objection is that the counterfactual-based epistemology fails to account for metaphysical necessities like the necessity of origin. For the account to cover such necessities, constitutive facts like the origin of a living being would have to form implicit constraints built into the capacity for everyday counterfactual reasoning. But is counterfactual reasoning indeed so constrained? I answer this question in the affirmative, presenting an epistemology of counterfactuals for modal epistemology to build on. The constraints gradually emerge by a broadly abductive process, starting from within everyday counterfactual reasoning. The process does not presuppose any independent knowledge of the constitutive status of certain facts.

Philosophers are often interested in questions how things *could*, and how they *must* be. In particular, they are interested in *metaphysical modalities*: could gold have an atom number different from 79? Could Aristotle have originated from a different sperm and egg than he actually did originate from? However, it is difficult to tell how we can know the answers to such questions. Since our experience of reality seems only to tell us how things *are* and at best within very close limits how they *could or must be*, there is a suspicion that philosophy must be special, exempt from empirical science.

This suspicion of *philosophical exceptionalism* gives rise to two concerns. (a) One may be *sceptical specifically about modal knowledge* (cf. van Inwagen 1998):¹ our epistemic capacities are attuned to reality, but nothing ensures that they are attuned to the modal questions asked by philosophers. (b) There is a concern that our capacities for modal reasoning *cannot be naturalistically explained*, e.g. by adaptive processes.² As a consequence, they seem spooky. We may wonder what their place in nature could be.

Moved by such worries, recently many philosophers have explicitly or implicitly pursued a *non-exceptionalist* program (e.g. Williamson 2007, Kroedel 2012, Fischer 2016, the authors in Fischer and Leon 2017). The aim is to show that the very same *capacities and methods that are used in cognizing reality can be used to answer philosophically interesting modal questions*. Non-exceptionalism promises to assuage the aforementioned concerns: (a) modal scepticism would lead to an implausible *general* scepticism about the capacities and methods of cognizing reality. (b) Modal knowledge can be included in a *naturalistic* explanation of knowledge in general.

An outstanding non-exceptionalist approach is Timothy Williamson's (2007): the epistemology of modality reduces to that of counterfactual conditionals via the logical equivalences:

¹ Van Inwagen is only sceptical about far-fetched modal claims. Strohminger and Yli-Vakkuri (2018) discuss whether his reasons for doubt can be transferred to Williamson's account. In particular, it seems doubtful that we can develop consequences of far-fetched antecedent (the if...-part) scenarios in sufficient detail. Williamson maintains that we are in a position to assess when a scenario has been sufficiently developed to support a confident verdict (Williamson 2007, 155). The account to come supports that the capacity of such an assessment arises together with the processes that calibrate counterfactual reasoning.

² 'To be sure, the most efficient mechanism to lead our ancestors to truth might also correctly encompass other possibilities, but it is highly implausible to think that it would encompass all possibilities, no matter how different from actuality.'(Nozick 2001, 122)

$$\Diamond A \equiv \neg(A \Box \rightarrow \perp)$$

$$\Box A \equiv (\neg A \Box \rightarrow \perp)$$

According to Williamson, we are defeasibly justified in asserting that A is possible if our development of the counterfactual supposition of A does not yield a contradiction. And we are defeasibly justified in asserting that A is necessary if our development of the counterfactual supposition of $\neg A$ yields a contradiction. The approach recruits our *everyday capacity for evaluating counterfactuals*. This capacity is useful and largely uncontested.

There are major doubts that Williamson's anti-exceptionalist project succeeds. To dispel these doubts, I shall present a *broadly abductive epistemology of counterfactuals and their relationship to metaphysical modality*.

I shall outline the argument to be developed in section (1.-5.): in (1.), I summarize objections to Williamson's counterfactual-based account, starting with *circularity*: (1.1.) counterfactual reasoning can only be bound by metaphysical necessity if we already know the pertinent constraints to be necessary. (1.2.) Williamson responds that counterfactual reasoning is reliably albeit *implicitly* subject to metaphysical constraints. One does not have to know their necessity. Two new objections arise. The *justificatory objection*: (1.3.) how can we justify that counterfactual reasoning is reliably constrained? The *exceptionalism objection*: (1.4.) the special requirement of *metaphysical* constraints violates non-exceptionalism. Intermediate conclusion: The justificatory and the exceptionalism objection remain to be answered.

In sections (2.-5.), I develop my *abductive* account of counterfactual reasoning. (2.) a case-by-case assessment of counterfactuals abductively supports that metaphysical constraints apply more generally. I make three *reliability assumptions*: (2.1.) we are reliable in assessing *everyday counterfactuals*, i.e. counterfactuals which are useful and easy to know. Moreover, we are reliable in assessing *non-everyday* counterfactuals (2.2.) as far as they do not come with *substantially different*

epistemic requirements than everyday counterfactuals, or (2.3.) as far as being reliable in assessing them makes the capacity of *everyday counterfactual reasoning easier to implement*.

Section (3.) is devoted to *everyday counterfactuals*: (3.1.) I use the example VACCINE CASE to show that *metaphysical constraints play a distinctive role* in their assessment, which I characterize by two claims (3.2.) *Irreducibility*: this role does not reduce to the general method of *minimum alteration*: staying as close to the actual world as possible. (3.3.) *Independence*: but it does not presuppose outright modal knowledge either. Rather it follows from our scientifically informed folk theory of the items talked about in the antecedent. Intermediate conclusion (from 2.1. and 3.): we are reliable in holding fixed metaphysical constraints in everyday counterfactuals.

Section (4.) extends the account to *non-everyday counterfactuals*. By (2.2.), we are reliable in assessing such counterfactuals provided they do not come with substantially different epistemic requirements compared to everyday counterfactuals. (4.1.) I use the example MARY CASE to illustrate that metaphysical constraints play a distinctive role, just as in everyday counterfactuals. (4.2.) *Independence*: we can learn to observe these constraints *without having independent modal knowledge*. (4.3.) *Growing base*: the more counterfactuals we assemble, the more we close in on *general* metaphysical constraints. Intermediate conclusion (from 2.2. and 4.): a growing base of counterfactuals abductively supports general principles of observing metaphysical constraints.

Section (5.) introduces Williamson's *counterpossibles*. (5.1.) By (2.3.), we have a reliable capacity to assess any counterfactuals as far as that capacity facilitates the assessment of everyday counterfactuals. (5.2.) A reliable capacity to assess Williamson's counterpossibles facilitates the assessment of everyday counterfactuals: it allows us to *test* principles of observing metaphysical constraints. I distinguish *two potential outcomes* of the test: (5.3.) *Vacuity*: if counterpossibles are vacuously true, they allow us to directly derive metaphysical modalities by Williamson's equivalences. (5.4.) *Non-Vacuity*: if counterpossibles are not vacuous, they track metaphysical relationships which provide information about metaphysical modalities. Intermediate conclusion

(from 2.3. and 5.): we are reliable in assessing counterpossibles which can be used as evidence for metaphysical modality.

General Conclusion on the (1.3.) *justificatory* and the (1.4.) *exceptionalism objection*: we are reliable in assessing both everyday counterfactuals and counterfactuals which eventually inform about metaphysical modality. There is no gap which makes modal knowledge exceptional.

I shall close with queries and replies in section (6.).

1. Challenges to Non-Exceptionalism

(1.1.) **Circularity objection**: One major concern about Williamson's account is that it presupposes something too close to explicit modal knowledge (Roca-Royes 2011, Tahko 2012). The *exemplum crucis* is *de re* modal knowledge of the necessity of origin:

(ORIGIN) Aristotle necessarily originated from the fertilized egg E he actually originated from.

Since many philosophers credit themselves with knowledge of ORIGIN, Williamson's theory should be able to account for it. To know ORIGIN, one has to evaluate a counterfactual supposition like the following: Aristotle originated from a different fertilized egg E'. The supposition should lead to a contradiction. For it to lead to a contradiction, Aristotle's actual origin E, being a '*constitutive fact*' (Williamson 2007, 164, m.e.), has to be imported into the supposed scenario although this conflicts with supposing that he originated from E'. Assume we have to draw on *discerning knowledge of constitutive facts* to import them into the supposed scenario. This discerning knowledge is so closely connected to modal knowledge that the counterfactual approach would have to account for it on pain of being fatally incomplete. A danger of circularity arises if Williamson's criterion for the necessity of origin *must already be used* to acquire knowledge that origins are constitutive.

(1.2.) *Response to the circularity objection:* Williamson already gives a hint of how to deal with the objection:

‘...we need not judge that it is metaphysically necessary that gold is the element with atomic number 79 *before* invoking the proposition that gold is the element with atomic number 79 in the development of a counterfactual supposition. Rather, *projecting* constitutive matters such as atomic numbers into counterfactual suppositions *is part of our general way of assessing counterfactuals*. The judgment of metaphysical necessity originates as the output of a procedure of that kind; *it is not an independently generated input*.’(Williamson 2007, 170, m.e.)

Consider

(ATOM) Gold could not have had an atomic number different from 79.

According to Williamson, the standard way of coming to know ATOM is the following: we know that gold has atomic number 79, but we do not yet know ATOM. Still a *reliable disposition* to hold fixed the atomic number of gold is part of our *normally developed capacity of assessing counterfactuals*. This disposition ensures that the counterfactual supposition that gold has an atom number different from 79 leads to a contradiction.

These cursory remarks did not appease Williamson’s critics. Sonia Roca-Royes challenges Williamson to specify how constitutive facts come to constrain counterfactual reasoning (Roca-Royes 2011, 44-45). She insists that we have to *‘knowledgeably’* hold them fixed (Roca-Royes 2011, 38, m.e.). Tuomas Tahko objects that there is no way to ‘test the method or to calibrate it in the first place.’(Tahko 2012, 108).

On behalf of Williamson, Juhani Yli-Vakkuri replies:

‘...it would be highly implausible to say that you do not know that the patch of grass is green unless you are knowledgeably sensitive to the right wavelengths. Something short of knowledge is enough: e.g., for a reliabilist it suffices that your visual system is reliably sensitive to the appropriate wavelengths.’(Yli-Vakkuri 2013, 619)

I read Yli-Vakkuri as follows: one can perceptually know the colours of things in virtue of reliably responding to the right wavelengths without being able to account for this reliability. In a similar vein, one does not have to *knowingly* hold fixed constitutive facts *as long as they reliably constrain counterfactual reasoning*.³ Just as perception, the capacity for counterfactual reasoning is part of our natural endowment. It is no *method* to be chosen, justified, and systematically calibrated in light of test procedures.

However, two new objections arise:

(1.3.) *Justificatory objection*: We have been given *no reason* that counterfactual reasoning is reliable in holding fixed constitutive facts. Why should we deem it reliable? To *internalists*, answering this question may be a prerequisite of modal knowledge. *Externalists* may disagree. But even they should admit that the question is a legitimate one. Answering it allows us to gain *reflective epistemological knowledge* as to whether the counterfactual-based account yields first-order modal knowledge and to vindicate the latter.

The objection reveals a potentially relevant *disanalogy* between modal knowledge and sense perception. We arguably have reflective knowledge confirming the reliability of sense perception. We have a *good understanding* of how sense perception works and why its reliability is evolutionarily useful. We do *not yet have a comparable understanding* confirming the reliability of counterfactual reasoning.

³ Yli-Vakkuri (p.c.) had in mind a safety-based theory rather than reliabilism. The question becomes whether counterfactual reasoning could have easily gone wrong.

Moreover, there is a revival of Tahko's calibration problem: unlike the sensitivity to wavelengths of light, the reliable disposition to observe metaphysical constraints must be *acquired*, starting from propositional knowledge about the actual world. The acquisition process must satisfy two conditions: (a) it must not presuppose anything that is too close to outright modal knowledge. (b) It should ensure our reliability in observing metaphysical constraints (imposed by constitutive facts).⁴ The question is whether there is such a process.

(1.4.) *Exceptionalism objection:*

'The problem with this proposal is that it will appear to violate Anti-exceptionalism unless accompanied by some reason to think that this sensitivity to necessary truths is a capacity we put to use outside of philosophy...' (Yli-Vakkuri 2013, 618)

To Yli-Vakkuri, the remaining problem is that the metaphysical constraints imposed by constitutive facts seem *special to philosophy*. Exceptionalism rises again. Yli-Vakkuri proposes a solution that replaces implicit constraints by property identities and the logics of counterfactuals. Yet he does not claim that his solution represents our normal way to modal knowledge. Moreover, construing modal claims like the necessity of origin as property identities is a move that won't go uncontested (cf. Biggs 2011, 316). We do not yet have a convincing anti-exceptionalist account of *normal* pathways to modal knowledge.

Intermediate conclusion: the justificatory (1.3.) and the exceptionalism objection (1.4.) remain to be answered.

2. The Abductive Approach

⁴ As Vaidya and Wallner (forthcoming) put it: 'Holding fixed the right set [of truths] cannot be magic.'

In order to answer the remaining challenges, I shall argue for a positive reflective assessment of counterfactual reasoning as a pathway to modal knowledge. I shall follow the literature in using the *necessity of human origin as my main example*. In section (6.2.), I shall discuss in how far the account generalizes to other constitutive facts. My motive for using a specific example is a bottom-up approach to constitutive facts: their special status gradually emerges from piecemeal evidence about the actual world and many case-specific everyday counterfactual considerations. If origins are not necessary, this evidence falls short of eventually (via additional counterfactual considerations) supporting the necessity of origin.

My account is based on three *reliability assumptions*:

(2.1.) *We are reliable in assessing everyday counterfactuals*. There is evidence from psychology that a capacity for assessing everyday counterfactuals is evolutionarily useful (reported in Kroedel 2012, 3). If we get them wrong, our failure can normally be explained by lack of factual information or localized mistakes. Among everyday counterfactuals considered in the literature are the following:

If I had lit a campfire, I wouldn't have been attacked by a tiger.(Kroedel 2012, 4)

If I ate an *Amanita Phalloides* I would be severely poisoned.(Roca-Royes 2012, 163)

If Fred had filed his tax return two hours before the deadline, he would not have been penalized.(Kment 2014, 221)

I provide the following working characterization of everyday counterfactuals:

- (a) Knowing them is *useful* for practical purposes (maintaining one's life).
- (b) They are *not too difficult* to know (e.g. overly complicated).
- (c) They can be known without having knowledge of metaphysical possibility and necessity.
- (d) The antecedent worlds considered in assessing everyday counterfactuals are close to actuality.

For instance, the laws of nature are the actual ones (except perhaps for a small miracle, see 3.2.).

I add two further assumptions on *non-everyday counterfactuals*, which I shall use in sections (4.) and (5.):

(2.2.) We are reliable in assessing non-everyday counterfactuals as far as our assessment does *not come with substantially different requirements* compared to everyday counterfactuals.

(2.3.) We are reliable in assessing non-everyday counterfactuals as far as our reliability in assessing them *makes everyday counterfactual reasoning easier to implement* (cf. Kroedel 2012, 2).

Drawing on these assumptions, I shall describe how dispositions to hold fixed constitutive facts gradually emerge from knowledge of facts and a growing base of counterfactuals. Far from being explicitly known, the constitutive role of facts is stored in dispositions to accept certain counterfactuals. These dispositions are formed in a broadly abductive process. Abductive reasoning is invoked for very different purposes in modal epistemology (e.g. Biggs 2011, Fischer 2015, 2016). In my account, it forms the general patterns implicit in our acceptance of ever new counterfactuals. Individual counterfactuals and general patterns stand in a relationship of *mutual reinforcement: the more counterfactuals we consider, the more we close in on the patterns, which in turn explain and guide our assessment of further counterfactuals*. The explanatory function may be described within our standard criteria of theory assessment as unification (cf. Kitcher 1989).

Since the constitutive role does not have to be explicitly known, the abductive process will often be implicit. I describe it as conforming to the requirements of a *potential* linguistic theory (broadly conceived as a principled system of rules which most effectively guides common linguistic practice).⁵ We do not actually have to provide a theory but only to act in accordance with it.

3. Metaphysical Constraints in Everyday Counterfactuals

⁵ Cf. Biggs on ‘tacit abduction’ (Biggs 2011, 318).

I shall now discuss the *first stage* of my abductive process. I build on the assumption (2.1.) that we are reliable in assessing everyday counterfactuals. The aim is to show that observing metaphysical constraints imposed by constitutive facts *makes a difference to assessing certain everyday counterfactuals albeit falling short of outright modal knowledge*. I shall call their distinctive role *proto-constitutive*.

(3.1.) The following scenario illustrates the *proto-constitutive role of origins*.

(VACCINE CASE)

John is a one year toddler, the only child of his parents. He is about to be vaccinated against a new form of meningitis. In 2018, the vaccine is fresh on the market. Until shortly before many children got infected. The past ordeal being salient, John's parents muse about the importance of keeping track of developments in medicine:

(VACCINE) If John had been born before 2017, he might have got infected.

However, John's genome has been tested for a specific immunity gene. His doctor replies:

'You are wrong. There is a rare immunity gene, which you lack and which your children are highly unlikely to have. But John has this gene. Hence

(¬VACCINE) Even if John had been born before 2017, he would not have got infected.'

I shall now argue that (¬VACCINE) is an everyday counterfactual. I compare it to a simple counterfactual which addresses a person's past *after* she was born. Consider Anne, who is like John save for the immunity gene:

(EASYVACCINE) If Anne had not been vaccinated in 2018, she might have got infected.

VACCINE is very similar to EASYVACCINE. A salient disastrous outcome was luckily avoided. Psychological evidence shows that people are sensitive to downward-looking counterfactuals like ‘If I hadn’t been wearing my seat-belt, I might have been killed’ (e.g. Markman and Tetlock 2000, 1213). Hence there are good reasons to count VACCINE among everyday life counterfactuals which are relevant to deliberation. The recipe: EASYVACCINE-like counterfactuals require us to interfere at some point which was decisive for the actual course a person’s life took. Now you may go backwards in time until you fiddle with the circumstances under which a person was conceived.⁶ For instance, *you transport the point in spacetime when she was conceived a little backwards*. There is nothing outlandish or spectacular in doing so. VACCINE is no fancy time-travel counterfactual (‘If Caesar had been in command in Korea, he would have used catapults/the atom bomb’). One may doubt the minutes of the scenario. Perhaps genetic immunity against meningitis is nomologically impossible. But scientific inaccuracies should be mendable. For all we know, a scenario like this might happen.

Presumably there is a certain vagueness in the parents’ use of VACCINE. They may just imagine toddler John in a situation without a vaccine available. Then the doctor’s reply comes with higher standards of precision.⁷ Once \neg VACCINE is on the table, these standards matter. The doctor seems right. John’s specific genetic trait must be held fixed; it is a structural feature that follows from his originating from a specific fertilized egg.⁸ \neg VACCINE also is an everyday counterfactual,

⁶ I assume that, for John to be born before 2017, a fertilized egg cell had to develop over several months. We could reformulate \neg VACCINE by the time of conception to avoid this assumption.

⁷ Such a raising of standards is quite normal in counterfactual discourse (cf. Klecha 2015).

⁸ The identity of the fertilized egg presumably does not depend on the immunity gene, nor does John’s origin. For instance, if John had not had the immunity gene, he might have got infected. However, if there is no special reason to the contrary, we are disposed to move the fertilized egg *as*

used to settle the truth-value of the everyday counterfactual VACCINE. Thus, it naturally arises in an everyday conversation on important life topics. As I shall argue in (3.3.), \neg VACCINE is not too difficult to know.

I have pointed out that everyday counterfactuals are useful. What would be the adaptive disadvantage of missing the role of origin in \neg VACCINE? We would miss practically relevant lessons from the past. VACCINE reminds the parents of the importance of vaccination, but they are likely to miss the relevance of the immunity gene to deciding on vaccination. Given the slight risks involved in vaccination, it might be preferable to test for the gene first. The lesson may be obtained without dwelling on \neg VACCINE. But the latter has special significance as a response to the downward-looking personally-involved VACCINE. One may wonder why John's identity matters so much (more on this below). But imagine your actual child in John's situation, and you will see that personal identity is highly important to us.

(3.2.) I shall now consider how we assess counterfactuals like (\neg VACCINE) and (EASYVACCINE). I use the two counterfactuals to highlight a difference. The aim is to show that the role of John's origin *is different from the role of contingent facts*.

The prevailing view of how we assess counterfactuals is *minimum alteration* as captured by the following principle:

(MINIMALDEPARTURE): in assessing a counterfactual, we preserve the actual laws (up to a small miracle) and actual facts as far as they are compatible with and do not explanatorily depend on the smooth coming about of the antecedent.

We assume a default *closeness ordering* of the following sort: under determinism, a 'small miracle', a small localized violation of the actual laws of nature leads to the antecedent: the laws at the closest antecedent world are slightly different (Lewis 1986), or the actual laws allow for exceptions

it is together with the time of John's conception.

(Kment 2014, 216). Under indeterminism, we might do without a miracle. Facts which explanatorily depend on the coming about of the antecedent do not count towards minimum alteration. The part about explanatory dependence cannot be found in Lewis's (1986) seminal account. However, it is standard in the most thorough recent elaborations of Lewis's original proposal (especially Schaffer 2004, Kment 2014, ch. 8).

Applying MINIMALDEPARTURE to EASYVACCINE, we imaginatively go back to shortly before Anne's vaccination and let a minuscule change happen: Anne does not get vaccinated. Then we figure out the changes downstream from the antecedent that are likely to come with the normal course of things. In some relevant pathway of history, Anne gets infected.

Coming to \neg VACCINE, we keep facts fixed as far as they are compatible with and do not explanatorily depend on the divergence towards the antecedent. This is why we preserve contingent facts like the number of nails on the doctor's hands. But the fact of John's origin has a different status. It is a constraint imposed on the way the antecedent comes about independently of minimizing the departure from actuality.

Compare *two worlds* competing for the minimal departure from actuality: in **w1**, *the fertilized egg John actually came from* is transported backwards in time. It pops into existence in 2016 by a small miracle (or some quantum event). For \neg VACCINE to be true as contrasted to VACCINE, a world like this, which preserves John's genome while moving the date of his birth, must display the minimal alteration from actuality which leads to the antecedent.⁹ In another world **w2**, a *different egg* is fertilized in 2016, a child develops from it and is born shortly before 2017 and subsequently called 'John' (I deliberately do not tell whether the child *is* John or a different person). Both w1 and w2 perfectly match past history until 2016. Then both substantially diverge. Disregard for a moment the issue of assessing \neg VACCINE and consider how w1 and w2 fare in terms of a

⁹ w1 typifies candidates for the closest world in which John's life starts from the same fertilized egg in 2016. The description may be fine-tuned to rule out some of these candidates.

default closeness ordering of worlds. I claim that w_1 is not closer to actuality than w_2 . To support my claim, I vary VACCINE CASE. Now the parents say:

(CHILD) If a child had been born to us not in 2017 but before, he might have got infected.

CHILD is not explicit as to whether the child is John or not. I assumed it to be highly unlikely for children of these parents to have the immunity gene. CHILD seems true. Clearly the child (whoever it is) might have got infected. The doctor cannot truly reply 'You are wrong'. However, assume for reductio that w_1 , the world in which *John* is transported backwards in time, is *closer* to actuality than w_2 . *w_1 should be among the outstanding candidate worlds for assessing CHILD.* If w_1 is closer than any world in which the child comes from a different fertilized egg, CHILD is false as the child in CHILD is John. Since CHILD seems true, w_1 cannot be closer than w_2 . Preserving particular matters of fact like John's existence and genetic disposition does not turn the table in favour of w_1 . One explanation of these findings is that match with the actual world which is explanatorily downstream from the way the antecedent comes about (such as John's existence and genome at w_1) does not count towards minimum alteration.

I have argued that w_1 is not closer than w_2 . Our acceptance of \neg VACCINE can only be explained if something disqualifies w_2 as the closest antecedent world for \neg VACCINE. w_2 is not disqualified by being less close than w_1 but by its failure to make the antecedent true. The default closeness ordering guides our assessment, but only provided the requirements of making the antecedent true are satisfied. Here is my proposal: *before it comes to preserving as much of the actual world as possible, we have to settle the constraints imposed by the truth of the antecedent. It is part of our understanding the antecedent of \neg VACCINE that the name 'John' as used in the antecedent refers to the same person in any everyday counterfactual scenario.* Our preference for w_1 can be explained by *our implicit grasp of how to preserve the referent of 'John': the referent must have the same origin.* This requirement is satisfied by w_1 but not by w_2 .

My explanation why we prefer w1 displays a general way to distinguish the proto-constitutive role within the procedure of minimum alteration. The proto-constitutive role does not always become manifest. Facts which are not explicitly stated in the antecedent sentence or entailed by it manifest a proto-constitutive role if they have to be held fixed not as a consequence of minimizing the departure from actuality but only as a consequence of the antecedent being true in the counterfactual scenario. The constraint of holding these facts fixed arises from projecting items on which the truth of the antecedent depends.

I do not claim that the origin of the bearer of a name figures in the semantics of proper names, or that one knows their semantics in the abstract. I only claim that the use of a proper name comes with certain requirements for a literal interpretation of everyday counterfactuals, and that we abide by these requirements. For any everyday counterfactual scenario, we are sensitive to the constraints which come with transporting *that particular item* to which the name applies into the scenario. –VACCINE resembles Kripke’s (1980) examples illustrating the rigidity of proper names. The bearer of a name is held fixed while her circumstances are radically varied. One is told to imagine John’s birth moved backwards in time. It is part of understanding this supposition that one is to preserve John. And though one is not told to hold fixed the fertilized egg John originated from, one feels compelled to do so.¹⁰

(3.3.) I have argued that holding fixed the origin of a person talked about is a metaphysical constraint on everyday counterfactuals independently of minimum alteration. I shall now answer *how we learn to observe this metaphysical constraint. In order to avoid circularity, our learning process must not involve outright modal knowledge that origin is necessary.*

My answer: the doctor’s *awareness of the explicit requirement to hold fixed John together with general empirical considerations* guides her in projecting John’s genetic features. I can only

¹⁰ Kripke (1980, 44) says that counterfactual situations are simply stipulated. Indeed the explicit antecedent is stipulated, but the substantial requirements for a situation to include the bearer of a proper name impose independent constraints on counterfactual reasoning.

hint at relevant aspects of scientifically informed folk theory. I do not aspire to a metaphysical motivation of the necessity of origin, nor do I suggest that empirical considerations establish the necessity of origin independently of additional counterfactual considerations. There are several reasons why the origin of a living being, exemplified by the event of an egg becoming fertilized, is crucial in making the living being the being it is: *first*, an egg being fertilized is a candidate for the generally most salient point in an individual's history. It captures the *key step in coming to actually exist*. *Second*, the fertilized egg has a *continuous causal impact* throughout one's whole life. *Third*, there is a *continuity of material constitution* relative to one's origin. Most of the material constituting a human organism has to be ingested in the course of its development. But the fertilized egg makes for the continuity of the organism when its material basis is still minuscule and eventually grows. It initiates and largely determines the process of ingesting material building the organism. There is a close connection between the bodily identity of the organism and personal identity.

Observations like these support that the identity of a person depends on the fertilized egg she came from. However, they are unlikely to ensure the necessity of origin, especially if the doctor does not consider them in the abstract, drawing out all their consequences, but rather as an implicit background for her dwelling on \neg VACCINE.

One may argue that the doctor's knowledge of \neg VACCINE presupposes knowledge of the necessity or constitutive status of origin. To explain why she can know \neg VACCINE without such knowledge, I shall elaborate my scenario a bit, adding natural assumptions about the doctor's epistemic position. Assume she never wasted a thought on issues like metaphysical necessity, essentiality, the logics and semantics of counterfactuals. If she were asked whether origin is to be held fixed throughout any counterfactual scenarios, or if she were exposed to far-fetched test counterfactuals like the contradiction-entailing ones used by Williamson, she would not know how to answer. She may simply lack sufficient grasp of the notion of necessity or the principled role of constitutive facts to judge. I guess the same goes for most people who have not been trained by

considering suitable counterfactual scenarios. They do not yet have sufficient grounds to believe that origin is necessary.

A more interesting issue is whether the doctor can be justified to endorse \neg VACCINE without being entitled to believe in the necessity of origin. There are reasons to answer this question in the affirmative. The doctor has *local* empirical expertise about the human body and the role of genetic endowment. This local expertise together with her linguistic competence allows her to settle \neg VACCINE. Her general routine of dealing with proper names makes her hold fixed the particular individual referred to by a name throughout everyday counterfactual scenarios. Her expertise makes her aware that *certain traits are so important to a human individual that they should be held fixed as long as the identity of the individual is held fixed*. Yet the expertise *does not extend to situations in which her medical science does not fully apply*, e.g. counternomological ones (except for a small miracle). In spite of being justified to endorse \neg VACCINE, the doctor may not be in a position to track the constitutive status of human origin throughout the realm of counterfactual scenarios.

I have argued that we need both knowledge of the actual world and a growing base of counterfactuals to close in on the constitutive role. I shall highlight some aspects of the base of counterfactuals. In tackling \neg VACCINE, the doctor becomes aware of the special demands of considering a scenario in which *that person* John is born earlier, holding fixed whatever makes the situation one featuring that person. In particular, \neg VACCINE makes her aware of how this bears on the immunity gene. Her judgement will set a precedent for further judgements, and so on. The more counterfactuals we consider, the more we close in on general patterns of counterfactual reasoning. We get a calibration process as requested by Tahko. The calibration is part of the general abductive process. Its reliability is part of our reliability in assessing everyday counterfactuals. Counterfactuals we intuitively accept form the explanandum which allows to weigh the achievements of principles of counterfactual reasoning like holding fixed origins.

Intermediate conclusion: Our reliable assessment of certain everyday counterfactuals depends on the proto-constitutive role of metaphysical constraints.

4. *Metaphysical Constraints beyond Everyday Counterfactuals*

In the last section, I have illustrated the first stage of my abductive process, confined to assessing everyday counterfactuals. I shall now proceed to the *second stage*, showing that *the proto-constitutive role extends beyond everyday counterfactuals*. The base of counterfactuals supporting the constitutive role grows accordingly. I shall build on the assumption (2.2.) that we are reliable in assessing non-everyday counterfactuals as long as they come with the same epistemic requirements as everyday counterfactuals.

(4.1.) To illustrate how we go on from everyday counterfactuals like \neg VACCINE to address more *recherché* ones, I use an example from philosophical debate. I do not claim that the example clearly belongs to the realm of everyday counterfactuals or goes beyond it. For instance, it may not satisfy the criterion of being practically useful. The example rather illustrates that there is *no natural epistemic boundary marking the realm of everyday counterfactuals*.

The tendency to *hold onto John's origin* in \neg VACCINE contrasts with the observation that the existence of one individual rather than a different one strongly depends on the moment of conception. Were it not for keeping John fixed, we would not be inclined to transport one particular fertilized egg into a spatiotemporally very different act of conception (see CHILD). Normally a slight variation in the moment of conception leads to a different egg becoming fertilized, and *a different fertilized egg normally leads to a different person*. The connection can be illustrated by the ethical non-identity considerations originally due to Derek Parfit. I only attend to the background assumptions:

‘When the act of conceiving a child is moved forward or backward in time by months or even moments, or when the manner of conception is itself altered (accomplished, e.g., via *in vitro* fertilization rather than coitus), the result, very probably, will be the conception of a distinct child

altogether. After all, any difference in timing or manner very probably will place a distinct inseminating sperm cell (out of hundreds of millions!) in proximity to the ovum or even result in a distinct ovum being inseminated. And a distinction in fertilized egg cells would seem in most cases sufficient to insure the conception of a distinct child.’(Roberts 2015)

Philosophers’ intuitions in non-identity cases may be driven by their opinions about the essentiality of origin. However, in this quote Roberts takes care to hedge his claim (‘in most cases’). I shall capture this modest claim by a ‘would probably’ counterfactual, read as stating that a high proportion of closest antecedent worlds are consequent worlds (cf. Schulz 2014):

MARY CASE

Assume Mary is in a non-identity situation, Al being her only child:

(¬IDENTITY) If Mary had had a child at a different point in time, it would probably have been a different child.

(4.2.) To avoid the circularity objection, I shall argue that *we can know ¬IDENTITY without presupposing the necessity of origin*. ¬IDENTITY is logically compatible with the claim that a person *could* have come from a different fertilized egg than she actually came from. Moreover, evidence sufficient for knowing ¬IDENTITY may not suffice for knowing the necessity of origin. The doctor in my ¬VACCINE-case is paradigmatic. She does not have enough evidence to believe that origins are necessary or constitutive. But she can be expected to have resources for assessing ¬IDENTITY. She has evidence for binding the existence of John to the fertilized egg he came from. This is why she imaginatively transports the fertilized egg back in time together with John. The doctor’s evidence also supports tying Al’s existence to the fertilized egg he came from. When

considering a situation where this egg is varied, she should conclude that in all probability a different person would have come to exist.

(4.3.) Our verdicts in the two kinds of examples together, variations under the constraint of *preserving identity* (expressed by use of proper names) and *non-identity* cases, *abductively support a more general principle of holding fixed origins*. Identity-preserving cases show how keeping a person's identity fixed requires to keep her origin fixed. Non-identity cases show how varying origins normally leads to different persons. A salient explanation for these findings is that origins play a constitutive role. Still our evidence may fall short of supporting the full constitutive role, as in the paradigmatic case of John's doctor. A person's origin is to be held fixed in a significant range of counterfactual situations, even beyond the range of everyday counterfactuals, but it does not yet follow that it is to be held fixed in all possible scenarios where the person exists.¹¹

The pertinent counterfactuals provide a rich base for assessing the constitutive role of origins. However, this base may not yet be sufficient. To supplement it, I shall now consider a *third stage* of my abductive process, leading from the role of origin in everyday counterfactual reasoning to counterpossibles, i.e. counterfactuals with impossible antecedents. I do not aim at establishing that we are generally reliable in assessing counterpossibles. Yet I shall argue that we are reliable in judging a certain range of them.

¹¹ As an example of more recherché counterfactuals bearing on the constitutive role of origins, imagine a mad scientist by a cunning device has replaced the fertilized egg E Aristotle came from (or only half of it, 25% of it...) at the very moment of his conception by an artificial *duplicate* with the same genetic make-up:

(REPLICA) If E had been replaced by a perfect replica, Aristotle would not have been born.

Dwelling on counterfactuals like REPLICA, mind-boggling as they are, is likely to make a distinctive contribution to our considerate verdict on the constitutive role of origins.

Intermediate conclusion: Our reliable assessment of a rich array of everyday and non-everyday counterfactuals lends abductive support to general principles of observing metaphysical constraints.

5. Counterpossibles as a Test for Metaphysical Constraints

Williamson's counterpossibles look exceptional as they deal with contradiction and vacuous truth. It is not a matter of course that the pertinent logical principles form part of the general logical capacities which are required in everyday counterfactual reasoning. The same goes for Williamson's equivalences. One should answer how they arise from everyday counterfactual reasoning.

(5.1.) I have assumed that (2.3.) we are reliable in assessing non-everyday counterfactuals as far as our reliability in assessing them makes everyday counterfactual reasoning easier to implement. I shall now argue that the capacity of everyday counterfactual reasoning is *easier to implement if it comes with a reliable capacity to judge certain counterpossibles*. Within the general abductive framework, counterpossibles are useful as a test for the constitutive role of certain facts. The explanatory potential of the resulting principles extends to any counterfactual judgement the truth of which depends on holding fixed constitutive facts. I shall indicate how our competence of assessing test counterpossibles naturally arises from the abductive process described so far.

(5.2.) Everyday counterfactuals are easier to assess if there is *a test for principled metaphysical constraints*. ¬VACCINE exemplifies the challenge of what to hold fixed in radically varying a person's circumstances of origin. It is useful to have a *principled* answer to this challenge. Everyday counterfactuals do not form a naturally eligible class with a clear-cut boundary. The same goes for the proto-constitutive role considered in isolation. The latter is likely to be available only case-by-case. For any new case, it will come with cumbersome tasks of weighing and deciding. It may also fail to close in on a precise answer what counts as an origin. Since holding fixed origins is important even for assessing some everyday counterfactuals, *a fully general and sufficiently precise*

principle of dealing with origins in any counterfactual situation, if available, would facilitate assessing everyday counterfactuals compared to a more casuistic procedure.

To close in on such a principle, it is useful to have a reliable capacity to assess counterfactuals which test what has to be held fixed in projecting a particular item into any counterfactual situation. The test is part of the abductive process outlined. The purpose is *not to settle modal issues* but to find *principles guiding counterfactual reasoning*. One's ability to assess test counterfactuals depends both on knowledge of actual facts and routines developed in considering counterfactuals like \neg VACCINE and \neg IDENTITY. This ability does not have to be immediately available to a normal reasoner like the doctor in my \neg VACCINE example. It may take a lot of additional training by considering more far-fetched counterfactual suppositions.

An *exemplary test* can be run for the fertilized egg E Aristotle originated from: What if Aristotle had originated from a different fertilized egg than E? Assigning a name to an arbitrarily selected different fertilized egg E', what if Aristotle had originated from E'? I shall discuss *two ways for the test to turn out*. One yields the *classical package of vacuous truth and Williamson's counterfactuals*, the other yields the *non-vacuity of certain counterpossibles* (there being true and false ones). Both are compatible with the letter of MINIMALDEPARTURE as both draw on the conditions of making true the antecedent rather than approximating the actual world: in one alternative, the implicit conditions of projecting an item mentioned in the antecedent (e.g. Aristotle's originating from fertilized egg E as a prerequisite of projecting *Aristotle*), are on a par with the explicit stipulation (Aristotle originated from a different egg E'), in the other, the latter prevails.

On the one hand, it is part and parcel to assessing any counterfactual that you (usually implicitly) import the antecedent into the consequent. This gives rise to the most trivial principle of counterfactual logics $A \Box \rightarrow A$. Clearly,

if Aristotle had originated from E', he would have originated from E'.

So far the two alternative outcomes of the test to be considered perfectly agree. They *diverge in how to implement the requirement of keeping fixed Aristotle*, leading to two different alternatives for the test to turn out.

(5.3.) *Vacuity*: I shall begin with the test result that supports Williamson's equivalences. In assessing sufficiently many counterfactuals, starting with everyday ones like \neg VACCINE, you have developed a disposition to project E into *any* counterfactual situation featuring Aristotle. The manifestation condition of this disposition is satisfied. Part of the disposition is to hold fixed the *uniqueness* of E as the origin of Aristotle. There is no room for adding another fertilized egg E' as Aristotle's origin. As long as E' is stipulated to be different from E, the details about its make-up do not matter. Your disposition manifests itself in the following result:

(CONTRADICTION) If Aristotle had originated from E', he would have originated from E' and he would have originated from E and not E'.

I have introduced CONTRADICTION as a test for the constitutive role. In assessing CONTRADICTION as described, you neither rely on the impossibility of the antecedent nor on the contradiction in the consequent or between antecedent and consequent (pace Gregory 2017, 830). You simply use your capacity for reasoning from the antecedent to its consequences: you manifest the disposition to import *the antecedent itself* and the disposition to import *Aristotle's actual origin* into the consequent.¹² The latter is an *implicit* condition for the antecedent to be true. The contradiction is the *result*. You get evidence that the principle of holding fixed origins is fully general by observing your tendency to import E into the consequent of CONTRADICTION. The constitutive role is already implicit in this tendency, but it only becomes *manifest* in considering

¹² Or to put it in terms of minimum alteration: to treat the closest antecedent world as one where Aristotle's origin is preserved whatever else is true at that world.

CONTRADICTION. Not even the threat of a contradiction prevents you from projecting origin into the consequent. Hence the disposition to do so is fully principled. By considering analogous test counterfactuals, the lesson can be transferred to any other constitutive fact.

How does your assessment of CONTRADICTION lead to an *impossibility claim*? You find yourself enmeshed in a contradiction, but you do not feel that you have made a mistake. Hence the problem must lie in the objective requirements of the supposition. These requirements cannot be jointly satisfied. I assume our most elementary grasp of metaphysical modality to include the following: *a counterfactual situation which is correctly described as 'A&¬A' is impossible*. This connection between counterfactuals, contradiction, and impossibility is systematized in the equivalences used by Williamson.

To arrive at the *logical principles* regimenting the use of CONTRADICTION, logics for counterfactuals and modality which include the logical equivalences and the vacuous truth of counterpossibles must enjoy the same kind of *abductive support* as the principle of treating certain facts as constitutive (cf. Williamson 2013, 423-429). They have to be measured against alternative logics for counterfactuals by standard criteria of assessing theories. On balance, they should represent the best alternative for systematizing and amplifying our practice of judging counterfactuals. A principle to treat CONTRADICTION as vacuously true and related to metaphysical impossibility systematizes our general tendency to import contradictory propositions into the consequent, and our take on the resulting counterfactual scenario.

(5.4.) **Non-vacuity:** I shall now consider the *alternative outcome* of the test. Notwithstanding the relevance of the background fact that Aristotle originated from E for keeping the identity of Aristotle, the explicit stipulation that Aristotle originated from E' prevails compared to our implicit understanding of the role of his origin in preserving the bearer of the name 'Aristotle'. More generally, constitutive background facts *are not held fixed throughout any counterfactual situation*. They are removed if they are *inconsistent with an explicit stipulation*. A principle codifying the constitutive role has to be *restricted* accordingly. CONTRADICTION turns

out to be a false counterpossible. It is false that, if Aristotle had originated from E', he would have originated from E. Again you neither have to rely on the impossibility of the antecedent nor on the contradiction in the consequent or between antecedent and consequent to get this result.

There is an intense debate on the vacuity of counterpossibles. In my proposal, the outcome of this debate depends on which logics and semantics for counterfactuals *strikes the best balance as an abductive hypothesis* about how to unify our practice of counterfactual reasoning by systematic principles, also taking into account our intuitions about counterpossibles like CONTRADICTION. On the one hand, vacuous truth is the classical option in the literature (Lewis 1973, 24-25). Moreover, often the non-vacuous truth of counterpossibles leads to weird consequences (Williamson 2007, 171-175). On the other hand, some counterpossibles seem intuitively true and some seem false.¹³ Moreover, these intuitions are explanatorily fruitful (Nolan 1997, Brogaard and Salerno 2013, Kment 2014).

I shall not predict the outcome of my counterfactual test or weigh the pros and cons of the two alternatives. Instead, I shall briefly indicate a version of the counterfactual-based modal epistemology that deals in non-vacuous counterpossibles. The handy criterion formed by Williamson's equivalences, a key advantage of counterfactual-based modal epistemology, is lost. Still the modal information enshrined in our capacity of counterfactual reasoning can be indirectly used to figure out metaphysical modalities.

To illustrate this claim, I shall sketch an exemplary way of reasoning from non-vacuous counterpossibles to metaphysical necessity. I assume that we drop facts which are inconsistent with the antecedent, even if they are constitutive. One may craft counterfactuals which manifest the

¹³ True: if Hobbes had squared the circle, then the mathematical community at the time would have been surprised.

False: if Hobbes had squared the circle, then sick children in the mountains of Afghanistan at the time would have been thrilled.(cf. Bjerring 2014)

metaphysical consequences of dropping these facts as contrasted to contingent ones. The following seems perfectly true:

If Aristotle had not been Alexander's teacher, he would still have been the particular individual who actually became Alexander's teacher.

Now consider ACTUALARISTOTLE:

(ACTUALARISTOTLE1) If Aristotle had originated from E', he would have been a different individual than the one who actually became Alexander's teacher.

(ACTUALARISTOTLE2) If Aristotle had originated from E', he would have been the same individual as the one who actually became Alexander's teacher.

ACTUALARISTOTLE just like CONTRADICTION serves as a test for the constitutive role of origins. The only peculiarity is the use of 'actually' in the consequent. 'Actually' is useful in everyday counterfactuals. It serves to keep features of the actual world fixed in considering counterfactual alternatives. ACTUALARISTOTLE can also be used as a test for the principled role of 'actually'. Hence my argument about our reliability in assessing test counterfactuals applies to ACTUALARISTOTLE.

Intuitions on metaphysically relevant counterpossibles strongly diverge. Hence I shall formulate my suggestion conditionally. *If* we reject ACTUALARISTOTLE1 and accept ACTUALARISTOTLE2, our intuitions may be used as *evidence against the essentiality of origin*, but only provided they are not to be explained otherwise.¹⁴ *If* we accept ACTUALARISTOTLE1 and reject ACTUALARISTOTLE2, our intuitions may -under the same caveat- be used as evidence

¹⁴ Perhaps they can be simply explained by the impossibility of the consequent of ACTUALARISTOTLE1 and the necessity of the consequent of ACTUALARISTOTLE2.

that *the identity of a person metaphysically depends on the fertilized egg she originated from*. ACTUALARISTOTLE instantiates a heuristic of approaching certain metaphysical laws: let G be a definite description contingently true of a (a would clearly be the same had G not been true of it). The actuality operator is standardly taken to rigidify descriptions. The scheme *if a were not F , a would be different from/the same as the item that is actually G* may be used to test whether a is necessarily F .¹⁵ In sum, there are prospects of extending the counterfactual-based epistemology to non-vacuous counterpossibles, which should be explored in future research.¹⁶

Conclusion on the justificatory and the exceptionalism objection: our reliability in assessing everyday counterfactuals abductively supports our reliability in assessing further counterfactuals which bear on the question of metaphysical necessity. There is no gap which makes modal knowledge exceptional.

6. *Queries and Replies*

(6.1.) ***Objection: the necessity of origin is contestable. Does my account depend on it?***

¹⁵ A further caveat is illustrated by SOCRATES (cf. Fine 1994, 4):

(SOCRATES1) If Socrates had not been an element of singleton Socrates, he would have been a different individual from the one who actually taught Plato.

(SOCRATES2) If Socrates had not been an element of singleton Socrates, he would have been the same individual as the one who actually taught Plato.

Assume we accept ACTUALARISTOTLE1 and reject ACTUALARISTOTLE2 but reject SOCRATES1 and accept SOCRATES2 although Socrates necessarily is an element of singleton Socrates. Then counterpossibles are sensitive to metaphysical relationships which are more fine-grained than metaphysical necessity. We have to reason back from the former to the latter.

¹⁶ For a similar proposal cf. Brogaard and Salerno 2013, 647.

Reply: I take a differentiated attitude towards the necessity of origin. On the one hand, I follow the literature in using it as a test case. I consider relevant counterfactuals under the assumption that we eventually come to believe that origins are necessary, and I consider how these counterfactuals arise from our theorizing about the actual world. On the other hand, my topic is modal epistemology and not metaphysics. My considerations should illustrate a general pattern for constitutive facts even if the necessity of origin eventually has to be rejected. In so far they do *not depend on the necessity of origin*.

(6.2.) *Objection: the argument is tailored to the peculiarities of human origins and does not generalize.*

Reply: I distinguish between the *general pattern* which manifests the constitutive role and its *specific* elaboration. *The pattern generalizes*: before applying MINIMALDEPARTURE, one must settle the requirements imposed on the counterfactual situation by the antecedent. Certain actual items talked about in the antecedent have to be held fixed for the antecedent to be true in the counterfactual situation. The constitutive role becomes manifest when we consider the implicit requirements of holding fixed these items.

To get an idea of how the pattern generalizes, take an example due to Boris Kment:

(LIQUID) If people were to use a certain colourless, odourless, tasteless liquid that is not composed of hydrogen and oxygen to quench their thirst, etc., they would use a liquid other than water.(cf. Kment 2006, 289, Roca-Royes 2012, 20)

More specifically, consider a sample under the description ‘the sample collected yesterday’:

WATER

(WATER1) If the sample had been water, it would have been H₂O.

(WATER2) If the sample had not been water, it would not have been H₂O.

(WATER3) If the sample had been H₂O, it would have been water.

(WATER4) If the sample had not been H₂O, it would not have been water.

These are *scientifically informed everyday counterfactuals*, which are true whether the sample indeed was water or not.

I have pointed out that we need some casuistry to discern the proto-constitutive role for different necessities, faced with alternatives like the following: WATER1-WATER4 are true because we have to approximate the actual laws of nature relating water and H₂O. One strategy of bringing out the *proto-constitutive role* as contrasted to this alternative is to consider the *epistemic* requirements of knowing WATER. I can only sketch the bare outline of a much more detailed argument: normally our knowledge of WATER will be supported by some pre-modal theory about the relationship between water and H₂O, comparably to our empirical knowledge about the role of the fertilized egg in making a person. Still our base of knowing WATER may be even sparser: someone may know WATER without knowing anything about the natural laws guiding the behaviour of water and H₂O, just by knowing (e.g. by testimony) that water *is* H₂O: both are the same stuff. Knowledge of this empirical fact interacts with our understanding the antecedent: before it comes to approximating actual laws and facts, one realizes that projecting water requires projecting H₂O and vice versa. This *sparse requirement* of knowing WATER testifies to the proto-constitutive role of water being H₂O.

I can only indicate how to go on beyond the proto-constitutive role. From WATER1-WATER4 we can proceed to more remote counterfactuals, among them the large-scale LIQUID. Upon amassing sufficiently many of them, we ultimately come to settle the full constitutive role. Depending on whether the assumption of vacuous or of non-vacuous counterpossibles prevails, there are different ways of approaching modal claims. The *analogue to CONTRADICTION* is

If water had been XYZ, water would have been XYZ and water would have been H₂O and not XYZ.

The *analogue to ACTUALARISTOTLE* is:

If water had been XYZ, it would have been a stuff different from/the same stuff as the one actually playing the water role.

These examples can be used like CONTRADICTION and ACTUALARISTOTLE, respectively.

(6.3.) *Objection: What if the point in time at which someone was conceived is necessary* (cf. Almog 1996)?

Reply: If the time of conception is necessary, VACCINE and \neg VACCINE are counterpossibles. They fail to satisfy my fourth criterion of everyday counterfactuals (closeness to actuality). They still have considerable evidential value. Assume counterpossibles are *vacuous*. Then our confident verdict that VACCINE is false and \neg VACCINE is true counts *against the time of conception being necessary*. If we assume that they are *non-vacuous* counterpossibles, the best explanation for our intuitive verdict still is that we preserve the *relationship between origin and personal identity*. We assess VACCINE and \neg VACCINE as described in section (5.4.). If our assessment fails, then presumably not because of the way we tackle the relationship between John and the fertilized egg he came from. Our treatment provides some evidence for the proto-constitutive role of origin.

(6.4.) *Objection: Roca-Royes (2012) rebuts the claim that knowledge of essences is presupposed by most everyday counterfactual judgements* (as a 'core capacity' of knowing counterfactuals).¹⁷ In her view, this sheds doubts on the continuity to Williamson's test counterfactuals.

¹⁷ To Roca-Royes, Williamson subscribes to this claim in (Williamson 2007, 171). But Williamson only says that the principled capacity for developing counterfactual suppositions which entail a contradiction cannot be disentangled from the capacity for assessing counterfactuals in general. He

Reply: I concur that essentialist knowledge is not a prerequisite of knowing *most* everyday counterfactuals. Yet my argument that metaphysical necessity makes a difference to our competence of assessing everyday counterfactuals only depends on a weaker claim: a reliable disposition to observe metaphysical constraints is a prerequisite of knowing *a certain range* of everyday counterfactuals like \neg VACCINE.

(6.5.) *Query: How does my proposal relate to Fischer's integrative theory-based approach?*

Reply: Fischer (2015) proposes to assess modal epistemologies in the same way as abductive hypotheses in general: by their theoretical virtues, especially conservatism and simplicity. According to Fischer (2016), the best framework is a *theory-based epistemology of modality (TEM)*. Claims to possibility and necessity have to be derived from theories (Fischer 2016, 238).

Fischer provides the following proposal how to reconcile TEM with a counterfactual-based account:

[Williamson] 'could adopt TEM as his story about how we come to justifiably believe those principles [of holding fixed constitutive facts], and then take the process of evaluating counterfactuals to be his story about the mechanism by which we transfer justification from our theories to specific modal claims.'(Fischer 2016, 244)

This particular reconciliatory proposal detracts from the elegance and simplicity of the purely counterfactual-based account. I propose to modify the proposal in line with Williamson's contention that the constitutive status of certain facts does not have to be independently known.

does not talk about essentialist knowledge, and he would firmly deny that we need outright knowledge of essences for knowing counterfactuals. Kment's (2014) view that knowledge of LIQUID and the like presupposes knowledge of the pertinent essences is a better target. I join Roca-Royes in arguing against this view.

Normal scientific theories sans counterfactual reasoning do not entail the constitutive role or necessity of certain facts. But any theoretical component which goes beyond our non-modal theory about the actual world may simply be integrated into counterfactual reasoning: we are disposed to accept certain counterfactuals. These *counterfactuals themselves form the theory* which secures a constitutive status for certain facts and allows us to derive modal claims. This view accords with TEM. It excels in *simplicity* because it only needs the scientific theories we endorse anyway and counterfactuals. And it excels in *conservatism* because it does with the beliefs we have, including beliefs in counterfactuals.

Almog, J. 1996. The What and the How II: Reals and Might. *Noûs* 30, 413-433.

Biggs, S. 2011. Abduction and Modality. *Philosophy and Phenomenological Research* 83, 283-326.

Bjerring, J.-C. 2014. On Counterpossibles. *Philosophical Studies* 168, 1-27.

Brogaard, B., Salerno, J. 2013. Remarks on Counterpossibles. *Synthese* 190, 639-660.

Fine, K. 1994. Essence and Modality. *Philosophical Perspectives* 8, 1-16.

Fischer R.W., Leon, F. (Ed.) 2017. *Modal Epistemology After Rationalism*. Dordrecht: Synthese Library.

Fischer, R.W. 2015. Theory Selection in Modal Epistemology. *American Philosophical Quarterly* 52, 289-304.

Fischer, R.W. 2016. A Theory-Based Epistemology of Modality. *Canadian Journal of Philosophy*

46, 228-247.

Gregory, D. 2017. Counterfactual Reasoning and Knowledge of Possibilities. *Philosophical Studies* 174, 821-835.

Kitcher, P. 1989. Explanatory Unification and the Causal Structure of the World. P. Kitcher and W. Salmon (Ed.), *Scientific Explanation*. Minneapolis: University of Minnesota Press, 410-505.

Klecha, P. 2015. Two Kinds of Sobel-sequences. Precision in Conditionals. *Proceedings of WCCFL* 32, 131-140.

Kment, B. 2006. Counterfactuals and the Analysis of Necessity. *Philosophical Perspectives* 20, 237-302.

Kment, B. 2014. *Modality and Explanatory Reasoning*. Oxford: OUP.

Kripke, S. 1980. *Naming and Necessity*. Cambridge/Mass.: HUP.

Kroedel, T. 2012. Counterfactuals and the Epistemology of Modality. *Philosophers' Imprint* 12.

Lewis, D. 1973. *Counterfactuals*. Cambridge/Mass.: HUP.

Lewis, D. 1986. Counterfactual Dependence and Time's Arrow, Postscripts to 'Counterfactual Dependence and Time's Arrow'. *Philosophical Papers II*. Oxford: Oxford University Press, 32-66.

Markmann, K.D., Tetlock, P.E., 2000. Accountability and Close-Call Counterfactuals. The Loser Who Nearly Won and the Winner Who Nearly Lost. *Personality and Social Psychology Bulletin* 26, 1213-1224.

Nolan, D. 1997. Impossible Worlds. A Modest Approach. *Notre Dame Journal of Formal Logic* 38, 535-572.

Nozick, R. 2001. *Invariances*. Cambridge: Harvard University Press.

Roberts, M. A., "The Nonidentity Problem", *The Stanford Encyclopedia of Philosophy* (Fall 2015 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2015/entries/nonidentity-problem/>.

Roca-Royes, S. 2011. Conceivability and De Re Modal Knowledge. *Nôus* 45, 22-49.

Roca-Royes, S. 2012. Essentialist Blindness would not Preclude Counterfactual Knowledge. *Philosophia Scientiae* 16, 149-172.

Schaffer, J. 2004. Counterfactuals, Causal Independence and Conceptual Circularity. *Analysis* 64, 299-309.

Schulz, M. 2014. Counterfactuals and Arbitrariness. *Mind* 123, 1021-1055.

Strohming, M., Yli-Vakkuri, J. 2018. Moderate Modal Skepticism. M. Benton et al. (Ed.), *Knowledge, Belief, and God: New Insights in Religious Epistemology*. Oxford: Oxford University Press, 302-321.

Kitcher, P. 1989. Explanatory Unification and the Causal Structure of the World. P. Kitcher and W. Salmon (Ed.), *Scientific Explanation*. Minneapolis: University of Minnesota Press, 410-505.

Tahko, T. 2012. Counterfactuals and Modal Epistemology. *Grazer Philosophische Studien* 86, 93-115.

Vaidya, A., Wallner, M. forthcoming. *The Epistemology of Modality and the Problem of Modal Epistemic Friction*. Synthese.

Van Inwagen, P. 1998. Modal Epistemology. *Philosophical Studies* 92, 67-84.

Williamson, T. 2007. *The Philosophy of Philosophy*. Oxford: Blackwell.

Williamson, T. 2013. *Modal Logics as Metaphysics*. Oxford: OUP.

Yli-Vakkuri, J. 2013. Modal Knowledge and Counterfactual Knowledge. *Philosophical Studies* 162, 605-623.