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# Dispositions and Potentialities

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# *Dispositions and Potentialities*

JENNIFER MCKITRICK

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Dispositions and potentialities seem importantly similar. To talk about what something has the potential or disposition to do is to make a claim about a future possibility—the “threats and promises” that fill the world (Goodman 1983, 41). In recent years, dispositions have been the subject of much conceptual analysis and metaphysical speculation. The inspiration for this essay is the hope that that work can shed some light on discussions of potentiality. I compare the concepts of *disposition* and *potentiality*, consider whether accounts of these concepts are subject to similar difficulties, and whether having a disposition or a potentiality can depend on extrinsic factors. The concept of a disposition I am working with is drawn from the recent literature in metaphysics and philosophy of science that focuses on the analysis of dispositional concepts and their role in a broader ontology. The concept of a potentiality is drawn from the bioethics literature that focuses on the moral relevance of potentialities that subjects of medical decisions may or may not possess. Some preliminary conclusions I draw are the following:

1. Potentialities are dispositions;
2. Due to problematic cases, potentiality ascriptions, like disposition ascriptions, are not reducible to counterfactual statements; and
3. Like dispositions, some potentialities can be extrinsic.

Here I do not aim to draw any conclusions about the moral relevance of potentialities but rather to outline conceptual and metaphysical options available to those who seek to employ this concept. However, to the extent that these options are relevant to answering moral questions, I am skeptical about the prospects of finding a value-neutral way to choose between them.

## Dispositions

The following is a fairly common philosophical characterization of a disposition: A fragile glass will shatter if you strike it hard enough. Fragility is the glass's

*disposition*, shattering is the *manifestation* of the disposition, and being struck is the *circumstance of manifestation*. The underlying cause of the glass's shattering constitutes the *causal basis* of the glass's fragility. The glass can remain fragile even if it never shatters. One can say of the fragile glass, with certain qualifications, that if it were struck, it would shatter. This characterization suggests certain "marks of dispositionality," according to which a property is a disposition if it meets the following conditions:

1. has a characteristic manifestation;
2. is such that certain circumstances can trigger that manifestation;
3. can be possessed without the manifestation occurring;
4. is instantiated by things of which a counterfactual of the form "if it were subject to the circumstances, it would exhibit the manifestation" is generally true; and
5. can be accurately characterized with an expression of the form "the disposition to produce the manifestation in the circumstances." (McKittrick 2003, 156)

I take it that these conditions are jointly sufficient for dispositionality, but I am not committed to their being individually necessary.

Dispositional terms and concepts are ubiquitous in human languages and conceptual schemes. This stands to reason, as humans frequently have pressing reasons to be concerned about predicting what things will do in various circumstances. It is important to know what is poisonous and what is nutritious, which animals are aggressive, and which situations are dangerous. As we investigate the natural world, we characterize substances as soluble, conductive, explosive, corrosive, and so on. We are interested to predict the behavior of our fellow human beings, and so describe them as *friendly*, *hostile*, *irritable*, *shy*, *ambitious*, *trustworthy*, and so on. Disposition ascriptions are the primary means of communicating our understanding of the causal structure of every aspect of our world.

Various accounts of dispositions have been offered. According to some accounts, to ascribe a disposition to something is tantamount to asserting a certain counterfactual conditional. For example, "x is fragile" is said to be true if and only if a counterfactual such as "if x were dropped, x would break" is true (Gundersen 2002; Choi 2006). According to other accounts, dispositions are second-order properties, and to have a disposition is to have some causal basis that would have a certain effect in certain circumstances (Johnston 1992). Another approach is to equate dispositions with fundamental, irreducible powers (Molnar 2003). While such powers cannot be analyzed in terms of anything more basic, proponents of such views argue, contrary to Hume, that it is a concept we acquire by experience that we can characterize

roughly as outlined above. In this essay I do not take a stand on which account of dispositions is correct, other than to cast doubt on counterfactual analyses.

## Problems for Counterfactual Accounts of Dispositions

Some philosophers claim that simple conditional analyses of dispositions have been conclusively refuted by a number of counterexamples (Martin 1994; Johnston 1992; Lewis 1997). One initial problem for a counterfactual analysis is trying to accurately specify the appropriate counterfactual. A few moments of reflection is enough to realize that “if you drop it, it will break” is a woefully inadequate and overly simplistic analysis of fragility. Such a counterfactual will not be true of a fragile glass if you drop it a fraction of an inch, drop it on to a fluffy cushion, or drop it in a low gravity environment. Dropping is not even necessary for a fragile glass to break—you can strike it where it sits. But if you strike it softly with a feather, it will not break. However, a very powerful blow could break even nonfragile things. In order to state a counterfactual that is true of a thing if and only if it is fragile, you would have to figure out the precise conditions under which fragile and only fragile things break—no easy task.

Even if you figure out the right counterfactual, a counterfactual analysis is still challenged by a number of counterexamples. One such counterexample is “masking,” which challenges the necessity of the analysis (Johnston 1992). Imagine a fragile glass that is packed with internal supports to prevent the glass from warping and therefore from shattering when struck. If you struck the packed glass, it would not shatter. The ascription of the disposition is true (the glass is fragile) but the counterfactual claim is false.

A counterexample to the sufficiency of a conditional analysis of dispositions is the case of so-called “mimics” (Smith 1977). A mimic is something that lacks a certain disposition but, for idiosyncratic reasons, acts as if it does. Odd circumstances result in a certain counterfactual being true of something that nevertheless fails to instantiate the requisite disposition. For example, suppose that a wooden block is brought to Neptune and that something about the strange atmosphere results in the block shattering when it is dropped. The counterfactual “if you had dropped it, it would have broken” is true of the block, but intuitively, the block is not fragile.

Another purported counterexample to the conditional analysis is the case of “finkish” dispositions (Martin 1994; Lewis 1997). Once we note that things can acquire or lose dispositions, we can generate counterexamples to a conditional analysis by supposing that dispositional changes occur at inopportune times and ways. An example of a finkish disposition is the fragility of a glass protected by a wizard who will immediately render it nonfragile if it is ever struck. A less fantastical example of

a finkish disposition is the instability of the DNA molecule. DNA is susceptible to breaking up due to certain forces, such as radiation and heat. However, forces which would break the molecule also trigger mechanisms within the cell nucleus that maintain the molecule's structure (Tornaletti and Pfeiffer 1996). An object has a *finkish disposition* if that object has a disposition that it loses in what would otherwise be the circumstances of manifestation. Consider the following conditional analysis:

- (A)  $x$  is disposed to exhibit manifestation  $M$  in circumstance  $C$  iff
- (B) if  $x$  were to be subject to  $C$ ,  $x$  would exhibit  $M$ .

If the disposition  $D$  is finkish, the same  $C$  that would cause  $x$  to exhibit  $M$  instead causes  $x$  to lose  $D$  before it can exhibit  $M$ . In this case, (A) is true:  $x$  does have the disposition. But (B) is false: If  $x$  were subject to  $C$ , it would not exhibit  $M$ . So, the analysis fails to state a necessary condition for  $x$ 's having a disposition.

A similar type of counterexample is called "altering" (Johnston 1992). A glass swan is fragile, but a vigilant monitor equipped with a laser beam will rapidly melt the swan the moment it is struck. The conditional is false, but the swan is fragile. Another example is the shy but intuitive chameleon (Johnston 1992). A chameleon is green and thus disposed to look green, but before anyone can turn on the light and look at it, it blushes red. In both these cases, the conditions of manifestation are such that, if they were realized, the object would "alter" and lose its disposition.

A thing can also finkishly lack a disposition. When green, the chameleon does not have the disposition to appear red, but when the circumstances of manifestation occur, it acquires that disposition. In this case, an object  $x$  that does not have disposition  $D$  gains  $D$  when exposed to circumstance  $C$ , and subsequently exhibits manifestation  $M$ . Arguably, (A) is false:  $x$  does not have the disposition. However, (B) is true: if  $x$  were to be subject to  $C$ ,  $x$  would exhibit  $M$ . This shows that the analysis fails to state a sufficient condition for  $x$ 's having a disposition.

Masks, mimics, finks, and many other clever counterexamples that may be devised suggest that analyzing a disposition ascription in terms of a counterfactual statement will always be fraught with difficulties. More sophisticated counterfactual accounts have been suggested, the prospects of which are an ongoing source of debate (Lewis 1997; Choi 2006).

## Marks of Dispositionalism as an Alternative?

Note that the fourth mark of dispositionalism mentions counterfactuals but is carefully hedged. I claim that if a property is a disposition, then it is instantiated by things of which a counterfactual of the form "if it is subject to the circumstances, it

exhibits the manifestation” is *generally true*, allowing for exceptions. That is to say, a thing might have the disposition in question even if the relevant counterfactual is not true of it. For example, “if you drop it, it will break” is not true of the carefully packed glass, but nevertheless, the glass is still fragile. Furthermore, it is not claimed that even this general truth of the counterfactual is necessary or sufficient for a property to be a disposition. Marks of dispositionality provide evidence that a property is a disposition, but do not constitute a reductive analysis of disposition ascriptions.

Since the marks of dispositionality are like rules of thumb, not necessary and sufficient conditions, there are limitations to the work that they can do. If a property bears most of the marks, I claim that that is some evidence that the property in question is a disposition. As an example of a disposition that lacks one of the marks, I suggest stability. Stability has most of the marks of dispositionality; however, it is not a property that can be possessed without being manifest—a structure that is not manifesting stability is not stable. Others argue that dispositions like radioactivity lack stimulus conditions (Vetter 2010). Like other rules of thumb, the marks of dispositionality are not decisive and will occasionally fail to deliver a conclusive verdict on particular problematic cases, where some of the marks are evident but others are missing or in question. This may be worrisome if the cases that interest us most in the bioethical context are borderline cases, where it is not clear whether a potentiality is present.

However, the marks of dispositionality are, I claim, still useful for deciding whether a general property is a dispositional property. This is the use that I put them to in this chapter, to argue that potentialities are dispositions. Note that the marks of dispositionality apply to property types, while the masking, mimicking, and finking cases feature particular property tokens. While there may be particular tokens or instantiations of a dispositional property that are finked or masked, that does not show that the general property does not bear the marks. So, even though a particular glass swan may be finkishly fragile, or have its fragility masked by careful packing, the general property *fragility* still (1) has a characteristic manifestation—breaking; (2) is such that certain impacts can trigger that manifestation; (3) can be possessed without breaking; (4) is instantiated by things of which a counterfactual of the form “if it were struck, it would break” is generally true; and (5) can be accurately characterized with an expression of the form “the disposition to break when struck.” If a property was never instantiated by anything of which the relevant counterfactual were true, that would not be a clear case of a dispositional property.

So, the marks of dispositionality primarily show that a general property is a disposition, not whether a certain object tokens a particular disposition. Other accounts may be more helpful in this regard. Proponents of powers defend the view

that perception can determine when and where a power is instantiated (Mumford and Anjum 2011). A second-order property account (Johnston 1992) helps to determine that something has a disposition, given that one can determine that something has a causal basis that would produce a certain effect in certain circumstances. A counterfactual analysis of dispositions (Gundersen 2002) offers a decision procedure, assuming one can determine which counterfactuals are true of an object. However, the many counterexamples to the counterfactual analysis show that the verdicts of that decision procedure are often counterintuitive: our judgments about what counterfactuals are true of an object are not decisive with respect to determining what dispositions the object has.

## Extrinsic Dispositions

It is a common assumption that dispositions are intrinsic (Lewis 1997; Johnston 1992; Molnar 2003). If a property is intrinsic, then whether something has that property does not depend on how things are with anything else, but only depends on how the thing is, in itself. If a property is *extrinsic*, then whether a thing has that property *does* depend on how things are with something other than itself. The following is an intuitive test for extrinsicness (though not reductive analysis): If *F* is an extrinsic property of *x*, then it is possible that *x* could be not-*F* without changing intrinsically, and possibly, a perfect duplicate of *x* is not-*F*.

Intuitively, when two qualitatively identical glasses roll off an assembly line, they are equally fragile, reflective, thermally conductive, and alike in any other disposition they may have. However, as I have argued elsewhere, some dispositions are not intrinsic to the objects that have them (McKittrick 2003). Perfect duplicates could differ with respect to having certain dispositions; a thing can lose or acquire dispositions without changing intrinsically. Weight may be dispositional, but it is not intrinsic. The weight of an object is relative to the object's gravitational field. Such extrinsic dispositions present yet another challenge for counterfactual analyses. On a counterfactual analysis, weight could be defined as follows:

An object weighs 100 pounds, that is, has a disposition to yield a reading of 100 pounds in circumstances of sitting on a standard scale; if it were sitting on a standard scale, then the scale would exhibit a reading of 100 pounds.

However, if the object were on the moon, sitting on the scale would not cause a 100-pound reading. One might object that being subject to a certain gravitational field is part of the circumstances of manifestation of weighing 100 pounds. However, this is not in accord with the meaning of *weight*, if ordinary usage is any guide. It is meaningful to ask what you might weigh on Mars or the moon (Exploratorium

1997). If the circumstances of manifestation of your weight included being in the Earth's gravitational field, there would be no cause to wonder what you weigh on the moon.

Other examples of extrinsic dispositions include vulnerability, visibility, recognizability, and marketability. Generally, when a certain counterfactual is true of something in some environments but not others, there is *prima facie* reason to think that that thing has a certain extrinsic disposition. If a property *P* (a) bears the marks of dispositionality and (b) is such that an object can have *P* while its perfect duplicate does not, then there is reason to think that *P* is an extrinsic disposition.

## Potentiality

The paradigm examples of potentiality claims in the context of this volume are statements such as: An embryo is potentially a person, or is potentially capable of rationality and agency; a patient has (or lacks) the potential to regain consciousness, or recover life-sustaining bodily functions. Similarly, a caterpillar is potentially a butterfly, an acorn is potentially an oak tree, and some students have the potential to be philosophers.<sup>1</sup>

In general, it seems that when one says “*x* is potentially *F*,” “*F*” refers to either (a) a property that *x* can have, or (b) a class or kind of which *x* can be a member. The occurrence or state of affairs, “*x* being *F*,” is the actualization of *x*'s potential to be *F*. One way for a thing to become a member of a kind is by acquiring certain properties that are characteristic of that kind. In that case, the two ways of being potentially *F* (where *F* is either [a] a property that one can have, or [b] a kind of which one can be a member) come to essentially the same thing (slightly complicated by the fact that kind membership may require having more than one simple property).

Another way one might become a member of a class is in virtue of decisions about group membership. This suggests that the possibility of future inclusion in a class would give one the potential to be a member of that class. For example, some astronomical body might potentially be a planet, or a college student might potentially be a sorority sister. These potentialities (if indeed they are potentialities) may seem to be different than the potentialities medical ethicists talk about. Arguably, the potentialities of an acorn or an embryo to develop involve intrinsic change of the individual with the potential, while the astronomical body or the student could become a member of the requisite class without developing or undergoing any intrinsic change. But, as I will later suggest, this might be a way in which some potentialities are extrinsic.

Another common use of the term *potentiality* that we should keep in mind is what might be called *epistemic potentiality*. When you think there is some chance



that something has a certain property, you might say that it “potentially” has that property. For example, suppose your perfectly healthy friend, John, is in the next room and you are not sure whether he is asleep or awake. You might express your judgment about John by saying “John is potentially awake.” Presumably, you are not making a claim that you would take for granted, that John, who is now sleeping, has the potential to be awake in the future. Rather, you are saying that, as far as you know, John is awake right now.

This sense of potentiality would seem to have little to do with the relevant potentialities of an embryo or a patient. However, it may be important to keep it in mind, lest we confuse our uncertainty as to whether something already has a certain property with the judgment that it could possibly acquire that property in the future. Perhaps this conflation is going on in Noonan’s “An Almost Absolute Value in History,” where he compares aborting a fetus with a hunter shooting into some bushes where a fellow hunter might be (Noonan 1970). In both cases, you could say “there is a potential person there.” However, in the case of the hunter, the potentiality is epistemic, whereas in the case of the fetus, arguably on the most plausible interpretation of the claim “there is a potential person there,” the potentiality is metaphysical (or at least not merely epistemic).

### Potentiality as a (Type of) Disposition

Potentiality-talk and dispositions-talk seem virtually interchangeable. When  $x$  is potentially  $F$ , one can say that  $x$  is *disposed* to be  $F$ , where “being  $F$ ” is the manifestation of  $x$ ’s disposition. Disposition ascriptions can likewise be put in terms of potentiality: If the bomb is explosive, it has the potential to explode; the fragile glass has the potential to break. Granted, potentiality-talk and dispositions-talk are not perfectly interchangeable. It might be the case that an oak tree is potentially a table, but that is not to say that it is disposed to be a table. And you might have the potential to be a drug dealer, even if you would not say that you are disposed to be a drug dealer. Many disposition ascriptions in ordinary language suggest a stronger tendency, a higher probability of the manifestation occurring, than do the analogous potentiality ascriptions.

However, such observations are consistent with potentialities being dispositions nevertheless. The ordinary-language connotation of disposition claims, that the manifestation has a high probability of occurring, is defeasible; some particular instantiations of dispositions are unlikely to manifest. Furthermore, it is a misnomer to talk of “the” disposition to so-and-so. Two different dispositions could have the same manifestation, but not be the same disposition. For example, being shy and being passive-aggressive can both manifest in anti-social behavior, yet they are dif-

ferent behavioral dispositions. So, there are some cases where the expressions “the potential to be *F*” and “the disposition to be *F*” pick out different properties, both of which are dispositions. Admittedly, this has a somewhat counter-intuitive implication that, for some property *F*, the potential to be *F* is a disposition that is not commonly called “the disposition to be *F*.”

Though the imperfect interchangeability of dispositions-talk and potentiality-talk is suggestive, a better way to gauge whether potentialities are dispositions is to consider whether they bear the marks of dispositionality. Consider an embryo’s potential for rationality: (1) It has a manifestation—being rational; (2) this manifestation will occur given certain, albeit very complicated to specify, circumstances of a favorable environment, nurturance, and so on; (3) an embryo can possess the potential to be rational without being rational; (4) a certain counterfactual is, other things being equal, true of the embryo (if a certain favorable environment and nurturance were to obtain, the embryo would become rational); and (5) it is not inappropriate to call the potential for rationality “the disposition to become rational.” It is also worth noting that, like many dispositions, potentialities seem to have causal bases. An embryo’s potential to be rational is not a brute, fundamental feature, but is presumably based on its genetic code and other biological factors, intrinsic as well as (possibly) extrinsic.

There is a slight complication with respect to the expression “the potential to be rational”: It is ambiguous between the disposition to *engage* in rational behavior, and the disposition to *be capable of* rational behavior. On the second reading, “being rational” is itself a capability, that is, a disposition, its manifestation being, very roughly, rational behavior. You can say of someone, while he is sleeping, that he is a rational person, though clearly he is not exhibiting any rational behavior. On that second reading, the potential to be rational is what you might call a second-order disposition—a disposition to acquire a disposition. So, while both a fetus and a normal sleeping adult human can both be said to have the potential to be rational, I take it that the adult has the first-order disposition for rational behavior, whereas the fetus has the second-order disposition to acquire the disposition for rational behavior. The same could be said about the potentiality for agency, for one does not have to be currently exercising one’s agency in order to be “an agent.” Likewise, an oak tree is photosynthetic at night as well as during the day, which suggests that being photosynthetic is a matter of being disposed to photosynthesize in the right circumstances, and that an acorn’s potential for being photosynthetic is a second-order disposition to acquire the disposition to photosynthesize.

So, a potentiality can be a disposition to acquire a disposition. What about its locus of manifestation? Given that the manifestation of *x*’s potential to be *F* is “*x* being *F*,” it may seem as though the manifestation of *x*’s potentiality must occur

where  $x$  is. When  $x$  manifests  $x$ 's potential to be rational, "being rational" happens where  $x$  is. This is not true of dispositions in general. A thing can be disposed to have an effect on something else: roses are disposed to smell sweet, provocative capes make bulls charge, and soporific lullabies put babies to sleep. In those cases, the locus of manifestation is not where the disposed object is.

However, the manifestation of potentialities can occur elsewhere as well. For example, when one has the potential to *do* something, such as score a goal, the effect that one has might not be where one is. Also, if someone has a potential to instantiate a disposition, the manifestation of that disposition may occur somewhere other than the location of the object that had the potential. For example, some people have the potential to be dangerous, funny, or annoying. When someone manifests being dangerous, funny, or annoying, it is often someone else that is hurt, laughing, or annoyed. One might argue that, while the manifestation of being funny is someone else laughing, the manifestation of "the *potential* to be funny" is "the person who had potential to be funny being funny" (and likewise for the other cases). So, the locus of manifestation is with the individual who had the potential. But, if the person does not count as being funny unless other people are laughing, then it is not clear that the locus of manifestation is with the person with the potential after all. Having the potential to instantiate a relational property is a similar sort of case. Consider the potential to be president of the United States. When that potentiality is actualized, it is the person who had the potential who now has the property of being the president of the United States. However, since having that property depends on complicated historical and social relations that go beyond the bounds of the individual, it is not clear that the locus of the manifestation is with the individual who had the potential. Rather than talk about the locus of manifestation being where the potentiated individual is, perhaps it is better to stick with the claim that the manifestation is a matter of the potentiated individual instantiating a certain property, where that property may be intrinsic, extrinsic, or relational.

As mentioned, potentialities, like dispositions, can be possessed without manifesting. But can they be possessed *while* manifesting? When a disposition manifests, the disposed object may or may not continue to instantiate the disposition. Sometimes, a thing loses a disposition when it manifests it, or even ceases to exist. The bomb is no longer explosive after it explodes. The match is no longer flammable once it has been lit. However, elastic bands are still elastic when stretched. Magnets are still magnetic even when they are manifesting their magnetism. What about potentialities? Does a person have the potential to be a person? Does a healthy person have the potential to breathe? Perhaps saying that  $x$  is potentially  $F$  is not equivalent to saying that it is possible  $x$  will be  $F$  in the future. There is no tension between saying that  $x$  is  $F$ , and that it is possible that  $x$  will be  $F$  in the future. But

there does seem to be a tension between saying that  $x$  is  $F$  and  $x$  is potentially  $F$ . This suggests that when potentialities have been and continue to be actualized, it is often no longer appropriate to say that they are possessed. However, there are exceptions. Someone may have the potential to grow and the potential to learn, realize those potentialities, and yet still have the potential for further growth and learning. So, it is false to say that a potentiality is never both actualized and possessed. Sometimes, saying that an  $F$  is potentially  $F$  is misleading and inappropriate, but perhaps it is not false.

For all these reasons, I suggest that a potentiality is a type of disposition. Typically, potentialities are dispositions whose manifestation occurs where the disposed individual is, whose manifestation is a matter of the disposed individual acquiring a property, possibly another dispositional property, and/or becoming a member of a kind, and arguably potentialities often cease to be instantiated once they are manifest. However, manifestations of dispositions also involve things acquiring properties. And since there are potentialities whose manifestation does not happen where the potentiated individual is, or where a thing manifests a potential and still has it, potentialities do not seem to have any essential characteristics that distinguish them from dispositions. So perhaps potentialities just are dispositions.

## Counterfactual Analysis of Potentiality

Masks, mimics, and finks were problematic for accounts of dispositions insofar as those accounts analyzed disposition ascriptions in terms of counterfactual conditionals. If these cases are also problems for an account of potentiality, that account must likewise analyze potentiality ascriptions in terms of counterfactuals. Such an account may look something like this:

- (A)  $x$  has the potential to be  $F$  in circumstance  $C$  iff
- (B) if  $x$  were in  $C$ ,  $x$  would become  $F$ .

It would be too quick to dismiss this proposal based on the observation that an embryo has the potential to be rational, but if you put an embryo in a womb, it will not immediately become rational. The circumstances of manifestation of the potentiality for rationality are not merely being placed in a womb. To make the account more plausible, we can stipulate that circumstance  $C$  has a duration and is dynamic over the course of that duration, providing all that is necessary at each stage of  $x$ 's development into an  $F$ .

Nevertheless, it would still be difficult, if not impossible, to specify in detail the circumstances of manifestation for the kinds of potentialities we are interested in. Recall the difficulty in specifying the conditions under which *fragility* manifests!

If the view is that something has a certain potential if and only if a certain counterfactual is true, then it is fair to expect to be told what that counterfactual statement is. But, in order to say what that counterfactual statement is, one would have to articulate the precise conditions which are sufficient for a thing to realize its potential. It would be inadvisable to make them too precise, lest you deny that potentiality to other things which may aptly be said to have it. Moreover, even if one were able to devise such a counterfactual, the analysis would still be stymied by masks, mimics, and finks, which suggests that a counterfactual analysis of potentiality is not going to be much help in dealing with problematic cases.

Surely, a thing's potential can be masked. An acorn could be placed in fertile soil, but if it were coated in hard plastic, the seed could not break through and grow. In that case, the seed might still have the potential to become an oak tree, but the associated counterfactual is false. The general problem is that, even if the specification of the circumstances of manifestation articulates all that must be present in order for the thing to realize its potential, the specification cannot rule out all of the possible factors which may interfere. To add to the analysis "and nothing interferes" would trivialize it. It would be a matter of explicating "*x* has the potential to be *F*" as "*x* will become *F*, unless it doesn't."

Interestingly, some of the most talked-about counterexamples to the moral relevance of potentiality appear to be variations on mimicking cases. Consider "super-kitten," a kitten that intuitively does not have the potential to be a person but is injected with a special serum that turns it into something with the characteristics of a person (Tooley 1972). A kitten receiving such extraordinary treatment is perhaps analogous to a wooden block being taken to Neptune, in the sense that, in both cases, unusual circumstances result in unusual behavior, and this challenges our application of concepts in normal circumstances. In effect, the kitten could exhibit the manifestation of the potentiality for personhood without having that potential at the outset. In that case, the potentiality ascription is false, but some associated counterfactual turns out to be true.

A potentiality could also be finkish. Consider again an acorn with the potential to become an oak tree. The circumstances of manifestation of that potentiality include dropping onto fertile soil. But suppose the gardener does not want any more oak trees in the yard, so he collects and crushes any acorn that drops. The circumstances that would normally result in an acorn manifesting its potential lead to its destruction. If the acorn has the potential to be an oak tree, that is a case in which the potentiality claim is true, but the associated counterfactual is false.

Something could finkishly lack a disposition as well. If some cloning or nanotechnology could turn something nonhuman into a human fetus, and if that procedure is initiated only if that something is placed in a uterus, then that thing would,

at the outset, lack the potential to be a human being. However, if it gets placed in the circumstances of manifestation, it would acquire that potential. Again, at the outset, the potentiality claim would be false, but the associated counterfactual would be true. I suppose the super-kitten could be recast as something that finkishly lacks the potential to be a person, if those who would provide the transformative agent would do so only on the condition that the kitten gets adopted by a family that intends to raise it as a human child, teaching it to speak and so on. It would be true of the kitten “if it is nurtured and educated, it will become a person,” even though, at the outset, it lacks the potential to become a person.

It is not surprising that a counterfactual analysis of potentialities would be subject to the same difficulties as a counterfactual analysis of dispositions. What is perhaps of greater interest is the possibility that what are presented as counterexamples to the moral relevance of potentialities could be construed as counterexamples to a counterfactual understanding of potentialities. It seems to be open to the defender of the moral relevance of potentialities to deny that the thing in question has the relevant potentiality, even though a certain counterfactual is true of it. Just because a counterfactual is true of something does not mean that it has the relevant potentiality—it may be a mimic, or it may finkishly lack that potential. So, on what basis do we attribute potentialities to things? The defender of morally relevant potentialities may look to causal bases (Lewis 1997). One may argue that, in order for something to have the same potential as a human embryo, it must also have the causal basis for that potential. This would help explain why we say that something retains its potential even when the associated counterfactual is not true of it, as when that potential is masked or finked. In those cases, the thing in question still has the causal basis of that potential. It would also explain tendencies to deny the potentiality claim even when the counterfactual is true, if the thing in question lacks the causal basis for that potentiality.

Suppose you have two duplicate acorns, the first of which will sprout if you place it in fertile soil, and the second of which will be picked up by the gardener if you place it in fertile soil. Even though the counterfactual “if you place it in fertile soil, it will sprout” is not true of both acorns, you may be tempted to say that, because they are perfect duplicates, they have the same potentiality, regardless of their differing with respect to the truth value of the relevant counterfactual. If you do say that, perhaps you are thinking that since the acorns are intrinsic duplicates, they must have the same causal basis for the potential to sprout, and therefore they must both have the same potential to sprout. However, note that you would be assuming that perfect duplicates must have the same potentialities—that potentialities are intrinsic. But given the possibility of extrinsic dispositions, this assumption is open to doubt.

## Extrinsic Potentialities

When determining whether a disposition or potentiality is extrinsic, it is important to distinguish “circumstances of manifestation” from “circumstances of possession.” Recall that the circumstances of manifestation of a disposition are those factors that trigger a disposition to manifest. In the case of fragility, the circumstances of manifestation were, roughly, dropping or striking. However, the circumstances of possession are whatever makes it true that the thing in question has the disposition. And since a disposition can be possessed without being manifest (an unbroken glass can be fragile), then the circumstances of possession can obtain while the circumstances of manifestation do not. If the circumstances of manifestation do not obtain, a thing can still have a potentiality without actualizing it. But if the circumstances of possession do not obtain, the thing does not have the potentiality at all. Having extrinsic circumstances of manifestation does not make a disposition extrinsic, and does not make potentialities extrinsic either. A fragile glass typically needs a strike from something extrinsic to it in order to break, yet that does not make the fragility extrinsic. A perfect duplicate in any circumstance may still be equally fragile. Likewise, an embryo needs many external factors in order to manifest its potential to become rational. By parity of reasoning, that fact alone does not show that the embryo’s potential is extrinsic.

In order for a fetus to be potentially rational or be disposed to become rational, there must be circumstances in which it would become rational. But in what sense is it the case that “there are” such circumstances? Since it is possible to possess this potential without manifesting it, it cannot be the case that these circumstances must actually obtain for the particular embryo to be potentially rational. However, saying that there are such circumstances, as long as such circumstances are logically or metaphysically possible, would allow too many things to count as potentially rational. Even given a metaphysically possible scenario in which rocks are turned into rational beings, we want to say embryos are potentially rational in the actual world while rocks are not. So, the circumstances which enable an embryo to become rational must be at least physically possible. We might want to place more restrictions on the range of possible circumstances and say that they must not only be possible in this world, but that circumstances of this kind are instantiated at some point in this world. Even further restrictions would be needed if, for example, one wants to say that an embryo is potentially rational while an ovum is not, since there is a commonly occurring physically possible causal process that leads from the ovum to a rational being.<sup>2</sup>

These decisions about which possible circumstances are going to count as circumstances of manifestation for a potentiality have implications for whether the

potentiality is extrinsic or intrinsic. As with looking for examples of extrinsic dispositions, the strategy for finding cases of extrinsic potentialities is to consider perfect intrinsic duplicates and see if they could differ with respect to their potentialities. This fits well with the moral principle that we should treat like cases alike. Perhaps, if two individuals have the same potentiality, there is reason to treat them both alike. Consequently, an argument for the moral conclusion that it is permissible to treat two individuals differently might do well to challenge the assumption that they have the same potentiality, even if they are intrinsically alike.

So, consider an acorn with the potential for “treehood” and a perfect duplicate of that acorn in a different world, all by itself. If the duplicate acorn lacks the potential for treehood, then that potential is extrinsic. So, does the lonely duplicate acorn have the potential? If the metaphysical possibility of the circumstances of manifestation was sufficient, then the duplicate acorn must have the potentiality too, and the potentiality turns out to be intrinsic, for it is necessarily shared by perfect duplicates. If the circumstances of manifestation must be somewhere occurring in that world, then the lonely duplicate acorn lacks the potential, and the potentiality must be extrinsic. If the circumstances of manifestation must be physically possible, then the duplicate acorn can still lack the potential for treehood, if it is in a world where the laws of nature would not permit any circumstance which would enable it to develop into a tree. In that case, too, the potentiality would be extrinsic.

However, some philosophers think that the relevant sense in which dispositions are intrinsic is that they are “intrinsic, keeping the laws of nature fixed” (Lewis 1997). A more interesting and relevant case, at any rate, is whether duplicates in the same kinds of worlds or different parts of the same world could differ with respect to a potentiality. Perhaps, if *F* is an extrinsic property, and one can be disposed to have extrinsic properties, then the disposition to be *F* will be an extrinsic disposition. For example, since *being popular* is an extrinsic property, the disposition to be popular is an extrinsic disposition. In addition, if something’s being *F* is determined by convention, then the disposition to be *F* could be an extrinsic disposition. For example, an entertainer might lose her disposition to be shocking in virtue of a change in her audience’s sensibilities.

This source of extrinsicity seems even more plausible in the case of potentialities. For example, one can potentially be an uncle, famous, or *Time*’s “Person of the Year”—each of which is partly determined by extrinsic factors. I could lose my potential to become an aunt by all of my siblings dying childless. Recall that when *x* has the potentiality to be an *F*, then “*F*” refers to a class or a kind of which *x* can become a member. Furthermore, there are at least two ways to become a member of a class or kind. One way is to acquire the properties which are sufficient for membership in that kind. Another way is for the determinants of membership in that



class to change. While such classes might not be considered “natural kinds,” there are some classes the membership of which is socially determined or determined by convention. Some argue that even so-called natural kinds are determined by convention (Dupre 1981). Consider Eris, an astronomical body beyond Pluto discovered in 2003. At that time, Eris was potentially a planet. Then, in 2006 the criteria for membership in the class of planets were refined by the International Astronomical Union. Now Eris is not potentially a planet. I assume that Eris did not change intrinsically in any relevant way. So, it seems Eris’s potentiality for “planethood” was extrinsic. In the case of human beings, an embryo might be potentially a citizen or a voter and could lose potentialities via changes in the political landscape in which she is located.

Sometimes, class membership is determined by the powers that be, by fiat, or any number of decisions procedures, about who or what to include in the class. For example, a beauty contestant is potentially Miss America 2012, but ceases to have that potentiality when she is not chosen to be one of the five finalists. Some social process decides who is included in the class, and if that process determines that one is no longer in contention, one can lose the potential without changing intrinsically. These types of extrinsic potentialities may seem to have little relevance to the types of potentialities the medical ethicist is interested in. But if being a person is more like being a member of a community rather than a biological kind, it is liable to having its membership determined by convention. If the extension of personhood is determined by convention, then the disposition to be a person could be an extrinsic potentiality. Something could gain or lose potential not by changing intrinsically, but by the powers that be determining a different standard of membership. For example, if members of a certain race were to be no longer considered persons, then their unborn children would no longer be considered potential persons (which may be an argument for not allowing arbitrary conventions to determine the category of personhood).

Perhaps there is another way for a potentiality to be extrinsic, keeping the standards of kind membership fixed, as well as the laws of nature. It would be helpful here to consider end of life cases, where one makes claims such as a coma victim is potentially conscious, or a terminal condition is potentially reversible. A patient might not be capable of recovering or becoming conscious, given current medical technology. However, it is possible that some future medical technology could reverse his condition. Do we want to say that the patient currently has the potential to recover? That could be cruelly misleading at best. Perhaps it would be more correct to say that they are not now potentially conscious, but if extrinsic factors were different, they would be. Then the patient’s potential for recovery is an extrinsic poten-

tiality. It is plausible that similar considerations apply if the necessary medical technologies exist but are not practically accessible, if they are very far away or prohibitively expensive, for example. Two patients with the same condition could have different potentialities due to the differing circumstances, and this entails that those potentialities are extrinsic.

Do similar considerations apply in beginning of life cases? We can consider cases of perfect duplicate embryos in different circumstances and consider whether they could have different potentialities. For instance, consider an embryo outside of a uterus and its perfect duplicate inside of a uterus. If there are no available means for implanting the embryo into a favorable environment, then by parity of reasoning with the end of life cases, we should say that the embryo lacks the potentialities enjoyed by its duplicate inside of a uterus. Therefore, the embryo's potentiality for rationality is an extrinsic potentiality. But how far can we push this idea that an embryo's potentiality can vary according to extrinsic circumstances? One thing to consider is what counts as "available means" for implanting an embryo. Surely, the medical technology must exist in this case, too. So, if we consider two duplicate frozen embryos, one in a fertility clinic with all the staff and equipment necessary for successful implantation, and the other in a remote location with no such amenities, perhaps we should say that those embryos have different potentialities. And if perfect duplicates can differ with respect to having a certain potentiality, then that potentiality is extrinsic.

However, another factor is necessary for successful implantation—people with the desire and resources to have the embryo implanted. If so, then the potentialities of frozen embryos depend on interests and resources of would-be fertility clinic patients. An egg selected for implantation would have different potentialities than one not selected. If we go that far, we should consider what to say about eggs conceived in other circumstances unfavorable to normal development, such as an ectopic pregnancy. Perhaps such an embryo would have less potential than a duplicate in more favorable circumstances. Another salient unfavorable circumstance for an embryo is to be in the uterus of a woman who does not want to be pregnant. It seems that there a sense in which an unwanted embryo has diminished potential as compared to its perfect duplicate with willing and able parents. If that is true, then that potentiality is extrinsic. But other extrinsic factors might be relevant to potentialities as well. If the availability of means to implant an embryo in a uterus were relevant to its potentialities, then the availability of means to remove an embryo from a uterus should be relevant as well. So, the potentiality of an unwanted embryo in the uterus of a woman with access to abortion services will be less than the potentiality of an embryo in the uterus without access to those services. In that light, debates about

the morality of access to abortion would seem to be less about how to respond to the potentialities that embryos antecedently have, as they are about what potentialities we are required to ensure that embryos have.

As we saw when considering problems for counterfactual accounts of potentialities, these considerations about the nature of potentialities suggest different ways to frame disagreements about the moral relevance of potentialities. Rather than disagreeing about whether the potentiality of an unwanted embryo or terminally ill patient is morally relevant, parties to the debate could reconsider whether the embryo or patient actually has, or should have, the potentiality in question. If these potentialities are extrinsic, the fact that the individual is intrinsically like another individual who does have that potentiality is not decisive.

This conclusion seems to be in tension with the response to masks and finks in which attributions of potentialities were made in virtue of whether the thing in question had the appropriate causal basis of that potentiality, regardless of whether it was situated in circumstances in which that potentiality could be actualized. Typically, those who think that causal bases are essential to dispositions are thinking of those causal bases as intrinsic (Lewis 1997). However, an alternative position is that not only can dispositions be extrinsic, but the causal bases of dispositions can be extrinsic too (Nolan 2005). So, the mistake of those who claim that intrinsic duplicates have the same disposition is not that they are only focusing on the causal basis of that disposition, but rather that they are only focusing on *part* of the causal basis of the disposition, and not taking into account the properties extrinsic to the disposed individual that are part of the causal basis of its disposition. In other words, if an embryo's potentiality is extrinsic, then the causal basis of its potentiality does not merely consist of the intrinsic properties of the embryo but also includes properties of its environment.

## Conclusion

It seems as though whether potentialities for consciousness, rationality, agency, and so on are intrinsic or extrinsic has potentially (no pun intended) significant moral consequences. If arguments against terminating care rely on individuals having such potentialities, and if these potentialities are extrinsic, then these arguments can be undermined in cases where individuals do not enjoy the extrinsic circumstances of possession of these potentialities. But *are* these potentialities extrinsic? I think there is a case to be made that they are. However, embryos and coma patients have many potentialities, some of them intrinsic, some of them extrinsic. In the case where an individual lacks an extrinsic potentiality because of current circumstances, it will often be true to say that they would have that potentiality if circumstances were

different. In other words, even if one lacks the extrinsic potentiality in question, one still has a second-order potentiality, a potentiality to have that potentiality. That second-order potentiality might be intrinsic.<sup>3</sup> Now, which potentialities are morally relevant: the extrinsic potentiality for consciousness, rationality, and agency, or the intrinsic potentiality to acquire those potentialities, or both? I take it that is a moral question which is not settled by the forgoing metaphysical considerations.

I have tried to outline a number of options regarding the nature of potentialities for those who would like that notion to play some role in their theorizing in bioethics, or elsewhere. There still are a number of decisions to make about how to explicate the concept of potentiality that is most relevant for one's purposes. How should one flesh out the associated counterfactuals, regardless of whether they hope to reduce potentiality claims to counterfactual conditionals? How should one circumscribe the relevant possible circumstances of manifestation for a given potentiality? Are the circumstances necessary for the actualization of a given potentiality to be counted circumstances of possession or circumstances of manifestation? Is the kind of which something is potentially a member a natural kind or a class whose membership is determined by convention? My anticipation, and perhaps my worry, is that these questions do not have answers that can be determined independently from the conclusions about the moral relevance of potentiality that a given theorist aims to establish.<sup>4</sup>

#### NOTES

1. "Potential" also has many uses in physics and other sciences, though comparing how these may be related to the concept at issue would take us too far afield.

2. I am not suggesting that there are good reasons to make such a distinction. If you do, you would have to place further restrictions on what counts as circumstances of manifestation. For an example of the claim that an embryo is a potential person but an ovum is not, see Covey (1991).

3. Complicating matters further, if as discussed earlier rationality is dispositional, the intrinsic potential for acquiring rationality would in fact be third-order: It would be the potential to have the potentiality to have the disposition for rational behavior.

4. Many thanks to John Lizza for inspiration and helpful comments on multiple drafts. Also thanks to Joe Mendola, Harry Ide, and the audience at my presentation of this paper at the University of Nebraska, Department of Philosophy, Faculty-Grad Presentation Series, March 2, 2012.

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