

## The Explanatory Link Account of Normality

### Abstract

*Few have given an extended treatment of the non-statistical sense of normality: a sense captured in sentences like “dogs have four legs,” or “hammers normally have metal heads,” or “it is normal for badgers to take dust baths.” The most direct extant treatment is Bernhard Nickel’s *Between Logic and the World*, where he claims that the normal or characteristic for a kind is what we can explain by appeal to the right sorts of explanations. Just which explanatory strategies can ground normalities, though, is difficult to determine without inviting circularity into the account. After raising this and other worries for Nickel’s account, I develop my own account according to which normal features are those which are explained by the kind of thing involved.*

### 1. Introduction

The words ‘normal’ and ‘normally’ are often used in a statistical or frequentist sense. That is, they are often used to mean something like ‘usual(ly)’, ‘frequent(ly)’, ‘ordinar(il)y’, or ‘regular(ly)’. They are also, however, often used in a different sense: one with a more *normative* rather than merely statistical or frequentist sense and inferential structure.<sup>1</sup> Normality judgments are judgments which explicitly or implicitly employ this concept of normality. As a group, they tolerate apparent exceptions and changes in the prevalence of the predicated property. But apart from their tolerance and insensitivity to prevalence, what are these judgments? Can we say something informative about this apparent family of generalizations?

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<sup>1</sup> Martin Smith has directly discussed this sort of normality at length in ‘Ceteris paribus conditionals and comparative normalcy’, *Journal of Philosophical Logic*, 36, no. 1 (2007), 97–121; ‘Justification, Normalcy and Evidential Probability’, *manuscript*; ‘What Else Justification Could Be’, *Nous* 44, no. 1 (2010), 10–31; and ‘Knowledge, Justification and Normative Coincidence’, *Philosophy and Phenomenological Research* 89, no. 2 (2014), 273–295. Direct discussions also appear in (among some others): Peter Alexander, ‘Normality’, *Philosophy* 48, no. 184 (1973), 137–151; Ruth Garret Millikan, *Language, Thought and Other Biological Categories* (Cambridge, MA: MIT Press, 1984); Paul Pietroski and Georges Rey, ‘When other things aren’t equal: Saving ceteris paribus laws from vacuity’, *British Journal for the Philosophy of Science*, 46, no. 1 (1995), 81–110; Jarett Leplin, *A Theory of Epistemic Justification* (Springer Science & Business Media, 2009); Seth Yalcin, ‘Modalities of Normality’ in Nate Charlow and Matthew Chrisman, eds., *Deontic Modality* (Oxford, Oxford University Press, 2014), 230–255; and Gerhard Schurz in ‘Pietroski and Rey on ceteris paribus laws’, *British Journal for the Philosophy of Science* 52, no. 2 (2001), 359–370; ‘What Is ‘Normal’? An Evolution-Theoretic Foundation for Normic Laws and Their Relation to Statistical Normality’, *Philosophy of Science* 68, no. 4 (2001), 476–497; ‘Ceteris Paribus Laws : Classification and Deconstruction’, *Erkenntnis* 57, no. 3 (2009), 351–372; ‘Normic Laws, Non-Monotonic Reasoning, and the Unity of Science’ in S. Rhaman, J. Symons, D. M. Gabbay, & J. P. van Bendegem (Eds.), *Logic, Epistemology, and the Unity of Science* (Dordrecht, Holland: Springer Science & Business Media, 2009), 181–211.

Bernhard Nickel,<sup>2</sup> it seems, might agree that we can. While giving an account of bare-plural generic sentences, he offers an account of the sort of normality at play in both discussions. He thinks normality is dependent on the ability of our experts to select the right kinds of explanations of the presence of a property in the population of members of the relevant kind. Those are the explanations which ground the normality of the relevant properties. I take issue with this account.

The account I'll develop is one according to which these claims are true if there is an explanatory link between the 'kind' (or the individual through time)<sup>3</sup> over which the claim generalizes and the feature, activity, or conditions posited for the kind. In short, the normal outcomes are those explicable with reference to the kind of thing for which they are normal.<sup>4</sup> The account is based on the *Aristotelian* intuition that it is normal for a carpenter to build a house because being a carpenter *explains* one's behavior in building a house.<sup>5</sup>

I'll offer some preliminaries in section 2, address alternative views in section 3 – most prominently Bernhard Nickel's account in section 3.1 – finally begin to develop my own *Explanatory Link* account of normality in section 4.

## 2. The Set Up

Normality judgments are a motley crew at the level of syntax<sup>6</sup> and so simply doing a lexical semantics of the word 'normal' or 'normally' won't capture the phenomenon as a whole. These

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<sup>2</sup> *Between Logic and the World: An Integrated Theory of Generics* (Oxford: Oxford University Press UK, 2016).

<sup>3</sup> When I use 'kind' throughout the discussion, it will stand in for 'kind or individual through time'.

<sup>4</sup> In other non-rival formulations, the normal is that which is included in being a kind of thing, or that which doesn't call for an explanation, or doesn't need a *special* explanation.

<sup>5</sup> Echoing Aquinas' *Commentary on Aristotle's Metaphysics VI* 2.1174, where he interprets Aristotle's *Metaphysics E* 2.1026a 33-1027a 28; and also Aquinas' *Summa Contra Gentiles* 3.97.8: 'For since each thing acts on account of its form, so does it suffer passion and is it moved on account of its matter.' (my translation).

<sup>6</sup> Note that in grouping these claims together, we're not claiming that they are transmutable *salva* inferential profile. We might expect that adding or removing a 'normally' might alter the inferential profile of a claim. Consider the case of transmuting from 'we meet at Joe's on Friday for breakfast', which can be used to set a policy for the future; and 'we normally meet at Joe's on Friday for breakfast', which it seems cannot. Corina Ströβner, in her 'Normality and Majority: Towards a Statistical Understanding of Normality Statements', *Erkenntnis* 80, no. 4 (2015), 793–809, supposes that there is a distinct logic to normality laws of the form '*k*'s normally  $\phi$ ' when compared with normality claims of the form 'it is

judgments are expressed using bare plural, determinate, and indeterminate generics;<sup>7</sup> sentences with the adverbial ‘normally’; sentences with what appears to be the quantifier or otherwise domain-restricting modifier ‘normal’; the grammatical constructions ‘it’s normal for  $k$ ’s to  $\varphi$ ’, ‘a normal  $k$   $\varphi$ ’s’, and ‘ $k$ ’s normally  $\varphi$ ’; among perhaps many others. Moreover, ‘normal’ and ‘normally’ appear to have at least two senses – as noted in the introduction – and so a semantic project is further quagmired at the level of the surface features of the linguistic phenomenon. With this in mind, I aim to focus in on a few focal cases individuated in terms of their *content* and then explore after the fact how far the analysis can extend.<sup>8</sup>

Let’s get on the table some focal normality judgments to serve as data for our study. Each appears, if anything does, to involve a non-statistical account of normality.

- (1) [Characteristic]
  - a. Dogs have four legs.
  - b. normal Dogs have four legs.
  - c. Dogs normally have four legs.
  - d. It is normal for Dogs to have four legs.
- (2) [Functional]
  - a. Hearts pump blood.
  - b. Hearts normally pump blood.
  - c. Normal hearts pump blood.
  - d. It is normal for Hearts to pump blood.
- (3) [Trajectory]

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normal for  $k$ ’s to  $\varphi$ . I am hoping to do something a bit more general here in that I want to understand what judgments intuitively involving non-statistical normality have in common and so Ströβner’s project is too narrow for my purposes.

<sup>7</sup> How do we in a principled and/or pretheoretical way work out the generics we intend to give an account for? Well, I won’t decide in advance. Instead, I’ll focus on some paradigm examples and decide ‘*a posteriori*’ how far this account will go in giving a semantics for generics. There are certain cases, most famously ‘mosquitos carry the West Nile Virus’, that make me think it won’t (and perhaps shouldn’t) cover every true generic.

<sup>8</sup> Some deny that normality enters at the level of truth-conditional semantics or anything resembling it. Instead, Veltman and Bastiaanse in their ‘Making the right exceptions’, *Artificial Intelligence* 238 (2016), 96–116, among others, argue that normality should be understood in terms of inference rules which don’t have truth or falsity, but instead only have some form of validity or invalidity. There is, on this view, no truth-conditional semantics for phrases containing or making implicit reference to the concept of normality. I disagree: I think normality judgments are truth or false and that we can at least develop some heuristics for knowing when they are true or false. One reason to reject the inference rule interpretation is that there is no clear way to handle normality judgments embedded within other normality judgments (or perhaps embedded within any judgment at all)—discussed in Manfred Krifka, Francis Jeffrey Pelletier, Greg Carlson, Alice Ter Meulen, Genaro Chierchia, and Godehard Link, ‘Genericity: An introduction’, in Greg Carlson and Francis Jeffrey Pelletier, Eds., *The Generic Book* (Chicago: University of Chicago Press, 1995), 1–124.

- a. A walnut grows into a walnut tree.
- b. A (normal) walnut grows into a walnut tree.
- c. A walnut normally grows into a walnut tree.
- d. It is normal for a walnut to grow into a walnut tree.

The analysis will be drawn from these types of judgments as its data, with 1-3 serving merely as paradigms for each type of judgment.<sup>9</sup> Characteristic claims amount to the claim that the feature in question is characteristic of the kind in question. Functional claims are a species of constitutives that ascribe a function to a kind of thing. Finally, Trajectory claims are claims that absent interference things will progress in a certain way. They are claims that there is something like ‘metaphysical inertia’ towards a particular goal or end state in that the modal profile of, say, a walnut includes the proposition that if things progress without interference, it will grow into a walnut tree.

One question for this study is whether or to what extent 4 and 5 shares the core features of normality judgments. We’ll explore these categories in the conclusion:

- (4) [Habitual] Dev is normally in his office by 2pm.
- (5) [Disposition] It is normal for Computers to turn on when their power buttons are pressed.<sup>10</sup>

4 and 5 will serve, therefore, as data for testing how far the account extends. Ascribing a habit or a disposition to a kind of thing seems importantly similar to the paradigmatic judgments we’ve introduced and so it will be interesting to see what they have in common and perhaps what they don’t have in common.

Regarding (1)-(3), two things can be immediately said: a) exceptions to the corresponding universal statement<sup>11</sup> – call these *apparent exceptions*<sup>12</sup> – aren’t *usually* exceptions to these

<sup>9</sup> Other plausible types of normality judgment are reliability claims, powers ascriptions, competence or capacity ascriptions, intention ascriptions, causal claims, etc.

<sup>10</sup> I’ve opted for compressed examples here in the interest of space. One shouldn’t read anything into this choice.

<sup>11</sup> Thanks to Sheldon Smith (*Personal Correspondence*) for the note that what others call ‘exceptions’ aren’t in fact exceptions but *would be* exceptions if the generalization in question were a universal claim; they are merely *apparent* exceptions. We can call an exception that truly undercuts a generic or normality claim a *real exception*.

<sup>12</sup> The question of what sorts of exceptions make trouble for normality judgments is a question worthy of its own treatment. For an extended discussion of related issues, cf. Sarah-Jane Leslie, ‘Generics and the Structure of the Mind’, *Philosophical Perspectives* 21 (2007), 375–405; and ‘Generics: Cognition and Acquisition’, *Philosophical Review* 117 (2008), 1–49.

generalizations, and b) the truth of each doesn't seem to rely (at least in any principled way) on any frequency or prevalence about the population over which the claim purportedly generalizes.

To demonstrate (a), we need only note that each is apparently true in spite of the fact that not all dogs have four legs, some hearts don't pump blood some of the time, and most walnuts never grow into adult trees. To demonstrate (b), we need simply note that even in a world where most dogs have been amputated, proposition (1) is still true.<sup>13</sup> Similarly, (2) and (3) will be true even when *all* of the hearts stop pumping blood or all of the walnuts fail to grow into adult trees – in any case they are certainly true when a great many hearts and walnuts fail to do what is normal to them. Each is therefore true somewhat independently of the actual regularity of the outcome being attributed to the kind (or individual) in the generalization.

The paradigm normality judgments – characteristics, functionals, and trajectory ascriptions – all also seem, at least at first glance, to have a *normative* inferential structure. If any individual in the generalized kind doesn't have the normal outcome<sup>14</sup> – if a heart doesn't pump blood, or a dog doesn't have exactly four legs, or a walnut doesn't grow into an adult walnut tree – then it will have *failed* or have been *deprived* with respect to that outcome and it furthermore *should* have that outcome insofar as it is what it is.

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<sup>13</sup> The truth of individual dispositionalals like 'The truth of individual dispositionalals like 'My computer turns on when I press this button' seem to be grounded in the truth of the corresponding kind-level dispositional – (5) in this case. This individual claim generalizes over cases of pushing that button on my computer, whereas (5) generalizes over all computers (and perhaps all pushings of computer 'on' buttons). So the truth of the example in this footnote should be somewhat insensitive to particular button pushings and the truth of (5) should be somewhat insensitive to particular computers (and perhaps their button pushings). This is just what we find: my computer can fail to turn on in a great many cases because I forget to charge the battery and it still be the case that my computer turns on when I push the on button. For (5), even a large amount of button pushings, even over a long period of time, might not interfere with the truth of the judgment. Similarly, a great many computers can fail to turn on when their 'on' buttons are pushed – after all, it's likely that most computers in the world are broken or in a junk yard – and yet (5) will still be true.

<sup>14</sup> There are also 'contrary normalities', which are cases where many different contrary outcomes are nevertheless normal. For now, we'll simply note that the discussion is riding rough shod over some intricacies. Later on, I will call these 'incomplete normalities' to contrast them with 'complete normalities' – normalities governing outcomes that have no competing alternative normal outcomes.

So (1)-(3) do not appear to be generalizations about *every* member of the class over which they generalize – i.e. they are not exception-intolerant laws or nomic generalizations. They furthermore do not seem to be judgments about a specific frequency or prevalence of an outcome in the class over which they generalize – i.e. they are not statistical or frequency generalizations. They are a distinct kind of generalization. With those observations in mind, we can develop a list of common features which are distinctly possessed by normality judgments as opposed to statistical and nomic judgments:

(Tolerance) Normality judgments all tolerate (remain true in spite of) exceptions to the corresponding universally quantified judgment. That is, they don't have straightforward counterexamples.

(Insensitivity) Normality judgments are all *relatively* insensitive to changes in the prevalence of the relevant outcome in the population over which they generalize.

(Normativity)(?) Normality judgments entail that any individual over which they generalize, insofar as it is a member of the relevant kind, *should* have the outcome being attributed.<sup>15</sup>

The focal normality judgments have these features (though normativity is perhaps not universal), so it is tempting to think that a common account can be given of such claims. At the risk of losing readers taken with the pluralist intuition that no common account can be given of these judgments,<sup>16</sup> I'll press on. The proof of that possibility will be in the putting forth of a successful account.

A final clarification is required at this point. There are two easily-confused sorts of questions we might be attempting to answer: a) what does it mean to claim that flying is normal for bald eagles? and b) why do bald eagles fly?<sup>17</sup> I am interested in the former, conceptual question, at the expense of answering the latter, more theoretical or empirical question. I'm not convinced that there is a unified

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<sup>15</sup> I use the words 'outcome' and 'feature' to stand in for features, relations, activities or behaviors, and conditions. I am weary of the philosophical baggage attached to 'property', though I'm not sure anything is strictly lost by interpreting me to mean 'property' by these words.

<sup>16</sup> As a bandage, I can offer the intuition that it would be quite odd if the conceptual space were divided into the, I take it, clearly unified statistical/frequency judgments, the similarly unified nomic judgments, and then a grab bag of judgments with no unity or even family resemblance that nevertheless share features like insensitivity and tolerance if not some version of normativity.

<sup>17</sup> Alternatively, we might think this question should be stated as 'why is it normal for bald eagles to fly?'

answer to (b), though I suspect that the functionality – broadly construed – of a feature is the answer more often than not to why it is normal for a kind. Instead, I’m attempting to understand *what we are saying* when we say that it is normal for bald eagles to fly. What is the meaning of such a claim?

### 3. Addressing the Alternatives

There are a host of potential alternative accounts to my own. Here are a few examples with at least potential defenders in the literature. Normality judgments track and exclusively track:

- Features where, for instance, biologists have a suitable normality-grounding explanation of the presence of those features in the population of a species.<sup>18</sup>
- Features that arise from the nature of an open dynamical system.<sup>19</sup>
- Features that historically have been selected for in a ‘reproductively established family’.<sup>20</sup>

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<sup>18</sup> Nickel defends such a view at great length in the following: ‘Generics and the ways of normality’, *Linguistics and Philosophy* 31:6 (2008), 629–648; Ceteris Paribus Laws: Generics and Natural Kinds, *Philosophers’ Imprint* 10:6 (2010), 1–25; ‘Generically free choice’, *Linguistics and Philosophy* 33:6 (2010), 479–512; ‘The Role of Kinds in the Semantics of Ceteris Paribus Laws’, *Erkenntnis* 79 (2014), 1729–1744; and *Between Logic and the World: An Integrated Theory of Generics* (Oxford: Oxford University Press, 2016).

<sup>19</sup> Gerhard Schurz, ‘What is Normal?’, appears to hold this view, though his target class of normality judgments is slightly different in that he is only interested in *complete* normality judgments. Cf. Nickel, *Between Logic and the World*, 180, and 180 n.3 for critical discussion thereof.

<sup>20</sup> This is something close to Millikan’s view in *Language, Thought, and Other Biological Categories*. Understanding exactly what she means by ‘Normal’, though, is frustrated by the lack of a direct analysis or treatment of the concept itself. The central clue on which I’m basing my interpretation is the following passage, in which she offers a preamble to her definition of proper function. ‘Where *m* is a member of a reproductively established family *R* and *R* has the *reproductively established or Normal character C*, *m* has the function *F* as a direct proper function iff...’ (*Ibid.*, 28, *emphasis mine*). If we attend to the italicized phrase, it appears that she is claiming that *reproductively established* and *Normal* are more-or-less interchangeable when it comes to the character of a family. A character is a set of properties had in common by all members of a reproductively established family that were produced normally (*Ibid.*, 25).<sup>20</sup> So a normal character is a reproductively established set of properties held in common in the first order case, and in the higher-order cases it is a set of properties got through normal production of members of the higher-order family. A normal feature, therefore, is a feature got as a result of one’s reproductive ontogeny that has been established historically within a reproductive family.

- What *would* or *will* happen in ideal<sup>21</sup> or perhaps normal conditions.<sup>22</sup>
- *Prototypical* features of a kind of thing, where prototypicality is defined in terms of similarity to the prototypical member of the kind.<sup>23</sup>

In the interest of space, I'll focus all of my attention on the most recently-defended of these alternatives: the first view, which is defended by Bernhard Nickel. In short, most of the others fail at the level of extension over judgements: historical and open dynamical systems accounts are too restrictive, prototypical accounts are too permissive. Ideal conditions accounts fail, by my lights, because they in principle cannot offer an illumination of what normal conditions are.

It will be helpful to recall, going into this discussion, that the account I'll offer at the end is roughly that normal outcomes are those the obtaining of which is *explained* by the kind of thing for which they obtain – as in the Aristotelian observation that identifying someone as a carpenter explains their behavior of building a house. Throughout the discussion, the contours of the view I'm developing – the Explanatory Link Account – will become clearer.

### 3.1 A Presence Account

The most plausible rival account is also perhaps the closest in its goals as it appears in the literature. Bernhard Nickel is interested in giving a semantics for bare-plural generic sentences by

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<sup>21</sup> Note that ideal is still somewhat ambiguous between different sorts of idealization. This ambiguity comes into view throughout the literature on *ceteris paribus* laws. For a sampling of different potential interpretations, see Wolfgang Spohn, 'Ceteris paribus', *Erkenntnis* 57 (2002), 354, and also Schurz, 'Ceteris Paribus Laws', for helpful surveys; *Ceteris Absentibus* comes from Geoffrey Joseph, 'The many sciences and the one world', *Journal of Philosophy* 77:12 (1980), 777; '*minutis rectis*' comes from Luke Fenton-Glynn, 'Ceteris Paribus Laws and Minutis Rectis Laws', *Philosophy and Phenomenological Research* 93:2 (2016), 274–305; though Nancy Cartwright, *How the Laws of Physics Lie* (Oxford: Oxford University Press, 1983) argues for a similar interpretation of many *ceteris paribus* laws.

<sup>22</sup> Romane Clark, 'Prima facie generalizations', in G. Pearce & P. Maynard (Eds.), *Conceptual Change* (Dordrecht, Holland: D. Reidel, 1973) gives voice to something like the view above, though not in these words.

<sup>23</sup> Similarity is often defined in terms of distance in multi-dimensional space, where each dimension defining the space is a particular determinable like 'size' or 'limb count' or the like. The closer an individual is to the prototype, the more prototypical and hence more normal one is. Cf. Peter G. Neumann, 'An attribute frequency model for the abstraction of prototypes', *Memory & Cognition* 2:2 (1974), 241–248.; Eleanor Rosch, 'Natural Categories', *Cognitive Psychology* 4 (1973), 328–350; 'Principles of Categorization', in E. Rosch & B. B. Lloyd (Eds.), *Cognition and Categorization* (Hillsdale: Lawrence Erlbaum Associates, 1978), 27–48; Eleanor Rosch, Carolyn B. Mervis, 'Family resemblances: Studies in the internal structure of categories', *Cognitive Psychology* 7:4 (1975), 573–605; and Eleanor Rosch, Carol Simpson, & R. Scott Miller, 'Structural bases of typicality effects', *Journal of Experimental Psychology: Human Perception and Performance* 2:4, (1976), 491-502.

appeal to a non-statistical sense of ‘normality’ – one that plays a guiding role in our explanatory and inductive practices and is independent of prevalence.<sup>24</sup> In service of this end, Nickel need not give an all-purpose account of normality,<sup>25</sup> so he doesn’t. I’d like to, conversely, test his proposal as an all-purpose account of normality.<sup>26</sup> My worry is that Nickel’s account depends on our ability to determine how to specify which sorts of explanations can ground normalities, and there doesn’t appear to be a way of doing this without introducing circularity into the account.

Nickel wants to give a semantics for bare plural generic sentences – sentences like ‘dogs have four legs’ and ‘male platypuses have venomous barbs’ and ‘elephants live in Asia’ – as existentials over ways of being normal in a given respect. So ‘dogs have four legs’ gets the semantic interpretation: ‘there exists a way of being a normal dog with respect to limb count and that way of being normal is having four legs’. The *respect* here is something like ‘limb count’, which is the dimension or determinable a determinant of which is the relevant way of being normal. A *way of being normal* is one of potentially many contrary properties a member of a kind can exhibit relative to a respect (see footnote 24). So far, I don’t take issue with Nickel. To the contrary, I find his treatment of generics quite compelling and insightful.

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<sup>24</sup> Nickel thinks that generics are existential quantifications over ways of being normal in a respect, where ways are contrary, but each normal, characteristics one can have (determinants of the determinable ‘respect’). Particular hair colors is an example of a way of being normal – humans are normally blonde, normally brown-haired, normally red-haired, etc. Respects are dimensions – like hair color – within which one or more value is normal for a kind and others are abnormal (respects are ‘determinables’). Reproductive method is one respect of being normal in that there are different ways to reproduce – internal gestation and live birth, egg-laying, etc. – and different species have different normal ways of giving birth. So, to say that ‘ducks lay eggs’ is to say ‘there is a way of being a normal duck with respect to reproduction and that way is to lay eggs’. I like Nickel’s analysis of generics and think it’s the most promising account available. I simply take issue with Nickel’s account of normality.

<sup>25</sup> Nickel calls it ‘genericity’, following much of the literature on generics, but as far as I can tell normality and genericity are the same phenomenon.

<sup>26</sup> Michael Strevens—in ‘Ceteris paribus hedges: Causal voodoo that works’, *Journal of Philosophy* 109 (2012)—also explores causal mechanisms as underwriters of defeasible regularities. In that respect, his discussion is similar to Nickel’s: both see the defeasibility of causal mechanisms as the source of the defeasibility of certain types of normalities.

It's Nickel's account of normality that's at issue. Obviously, Nickel owes us a definition of normality if he is to hang all of this semantic weight on the notion of a 'way of being normal'. His account has a few moving parts. He first defines characteristic properties (which are, I take it, normal properties for a kind) by appeal to explanatory strategies. An explanatory strategy is, on first pass, a set of explanations which appeal to one coherent set of explanatory factors. Evolutionary explanations, for instance, appeal exclusively to selective pressures, adaptivity, differential reproductive success, and so on. So an evolutionary explanatory strategy is one which appeals to only these factors.<sup>27</sup>

A characteristic property of a kind relative to a set of explanatory properties  $S$  is a property the presence of which can be explained by appeal to  $S$  (or a subset of  $S$ ). The presence of croaking among the population of bull frogs can be explained by appeal to evolutionary explanatory strategies and so croaking is characteristic of bullfrogs (normal for bullfrogs).

What does 'presence' mean? Nickel (*Ibid.*, 182) precisifies the concept to ' $P$  is present among  $K$ s at [time]  $t$  iff at some time surrounding  $t$ , some  $K$ s are in fact  $P$ '. The temporal extension into the future and past of 'some time' is relative to the explanatory strategies being evoked. Evolutionary explanations, for example, will require long temporal extensions. Geological explanations will require much longer timespans still.

Now how do we bridge the gap between the characteristic properties of a kind and normal members of that kind? Nickel does so by appeal to causal mechanisms. Normal dogs go through a developmental process (a causal mechanism on Nickel's account) which produces exactly four legs and that developmental process is the explanation for the presence of four-leggedness in the temporally extended population of actual dogs. Dogs with four legs are normal because they participate in the causal mechanisms cited in the normality-grounding explanatory strategies

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<sup>27</sup> See Nickel, *Between Logic and the World*, 178-196 for a full discussion of the definition of characteristicness in terms of explanatory strategies.

employed in the explanation of the presence of four-leggedness in the population of dogs. Hence abnormal properties, on Nickel's account, are those which cannot be explained by the right kinds of explanatory strategies – he puts the analytic weight on the fulcrum of explanatory strategy selection.

How, then, does Nickel propose to restrict the sorts of explanatory-strategies that can ground the normality of a property? He supposes that in some cases a set of explanations instantiating an explanatory strategy is manifestly coherent. Perhaps evolutionary explanations are clearly coherent in that they appeal, as noted earlier, to the same sorts of explanatory factors. Other times, when it is less clear how many explanations cohere into one explanatory strategy, Nickel suggests that those implicitly appealing to explanatory strategies of which they are ignorant are also implicitly deferring to the experts – recalling linguistic externalism *a la* Kripke and Putnam. More concretely, when I say that it's normal for Elephants to live in Africa, I do not know the right explanation and so I am deferring to paleontologists, evolutionary biologists, and other experts.

Nickel's account is, near as I can tell, the most developed representative of a class of accounts of normality that I'll call Presence Accounts. They seek to define normal properties<sup>28</sup> in terms of the possibility of explaining (by appeal to the sanctioned explanatory strategies) the presence of some property or feature in the population of members of the relevant kind.

My account will alternatively seek to define normal properties in terms of the ability of the kind itself to do explanatory work – in terms of the explanatory link a kind has with its normal properties. This is why I call the class of accounts to which mine belongs the Link accounts. So, whereas Presence accounts want to say that it's normal for dogs to have four legs because we can explain the presence of four-leggedness in the population of dogs, Link accounts hold that it's normal for dogs to have four legs because being a dog explains why any given dog has four legs. A link account will

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<sup>28</sup> It's worth noting another difference between our accounts. Whereas Nickel is primarily interested in defining what it means to be a normal  $k$  with respect to a property (P-Normality), I am more interested in defining the normal properties or features. This doesn't amount to a substantive difference, but merely a difference in emphasis.

put the analytical weight not on explanatory strategies, but on the specification of the individuals involved – specify the individual at the right level and you’ll have an explanation for why that individual should have any of the corresponding normal properties.

I want to discuss two central worries for a presence account: 1) it doesn’t seem to work as a simple analysis of ‘normal’ at first glance, whereas a link account seemingly will; and 2) it relies on a restriction of admissible explanatory strategies, which Nickel thinks can be accomplished by deference. The problem with such a move is that the deference targets (for instance, the biologists) must be devoid of tacit or explicit employment of non-statistical normality and it’s at least not clear that they are.<sup>29</sup> If we have to choose, therefore, between link and presence accounts, I am arguing that we choose a link account.

A presence account will say that the normal is that for the presence of which we can explain by appeal to the right explanatory strategies. The worry is that it doesn’t seem right to say, for example, ‘biology explains why cats stalk, which is to say, it’s normal for cats to stalk’. It seems like, on its face, this can’t provide an analysis of what it means to say a property is normal for a kind. Conversely, a link account will provide an analysis that is more satisfying: ‘Its black because it’s a raven, which is to say, it’s normal for ravens to be black’. Now, neither of us needs to provide an analysis in the classical sense of the concept of normality, and indeed neither of us is trying to do this. Nevertheless, it seems that an account of normality which sounds better as a *prima facie* analysis of normality seems to be better for it.

The deeper worry is that a presence account puts the analytic burden on the process of restricting explanatory strategies in the right way, but this process is not clearly up to the task without introducing circularity into the account. For instance, we intuitively need to disallow as a normality-grounding explanation the explanation for albinism in Ravens. Albinism causes Raven

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<sup>29</sup> This does constitute Nickel’s metaphysical account of *genericity*, which one wouldn’t be entirely mistaken to think is – if not the same as – at least closely related to non-statistical normality.

feathers to be brittle and sticky rather than durable and waxy. Albino ravens therefore cannot sustain as long of flight and are more sensitive to sunlight – both of which are antithetical to the raven form of life.<sup>30</sup> Nickel argues that the explanation of albinism in ravens grounds a derivative normality judgment to the effect that *albino ravens are white*. But since the explanation applies only to albino ravens – a derivative subgroup – the judgment that *ravens are white* is blocked. In talking about ravens, we tacitly defer to experts – biologists in this case – and this deference restricts the set of relevant explanatory strategies to ones concerning ravens in general.

First, it isn't clear what makes different morphs of a polymorphism (a normal variation) distinct from black and albino ravens apart from notions tightly linked to non-statistical normality – adaptation, naturalness, defect, etc. Each is caused by a genetic variation that produces a different phenotype.<sup>31</sup> Either biologists, therefore, are using a conception of non-statistical normality to distinguish between normal variations and mutations proper like albinism, or they are using some other method for distinguishing them. Herein lies the problem: if biologists don't uniformly use methods other than a tacit appeal to non-statistical normality, naturalness, and the like to distinguish between polymorphisms and cases like albinism, then Nickel's presence account employs non-statistical normality – by way of appealing to deference to biologists – in giving an account of non-statistical normality. This is a serious problem, indeed.

Here is why it is plausible to suppose that biologists make appeal – explicit or tacitly – to non-statistical normality in distinguishing normal variations from mutations like albinism. The first thing to note is something Nickel himself points out: that normal variations are adaptive or at least not maladaptive whereas albinism is maladaptive and thus the symmetry between the developmental mechanisms can be broken by appeal to the ultimate, adaptive explanation. Adaptivity claims about

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<sup>30</sup> Cf. Jennifer Huizen, 'Rare albino raven murdered', *Audubon* (2015, July), retrieved from <https://www.audubon.org/news/rare-albino-raven-murdered>

<sup>31</sup> N.B. that some polymorphisms are caused by environmental cues alone, but we can safely ignore these cases and restrict our focus on the genetically-determined polymorphisms.

features are claims that an organism is better off for having those features with respect to a set of environmental pressures and affordances. They're claims to the effect that the *kind's* relation to its environment (or perhaps more properly to its *niche*) sets standards which members of the kind meet to varying degrees. Since members of a kind don't all share the traits that are adaptive for that kind, but it nevertheless remains adaptive, adaptivity claims have the hallmark inferential profile of normality claims. On this basis, I'm claiming that adaptivity claims are a species of normality claim.

Second, the task before the biologist is to distinguish cases of normal variation from abnormal variations in the same respect. The problem is that they must do so without appeal to normality. What does this entail? Well, any theorist of normality will agree that 'normal' in the non-statistical sense describes properties which characterize a kind *independently* of the statistical prevalence of that property in the population of actual members of that kind.<sup>32</sup> So, any principle that biologists appeal to in distinguishing between explanations that ground normal variation and those that ground abnormalities like albinism will have to make appeal to either universal laws governing the relevant biological kind or statistical generalizations about the prevalence of the properties in the population. Since biology famously doesn't conform to universal laws, we're stuck with statistical generalizations. I'm pessimistic that a distinction between black and albino ravens can be drawn on purely statistical grounds, simply since it's conceptually possible that albinism runs rampant, thus characterizing a majority of ravens. If we're pessimistic that this can be done in biology, even by appeal to partitioning and the like,<sup>33</sup> then we're in even hotter water when it comes to artifacts, where standards and functions are built into the kind in a more obvious and intimate way.

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<sup>32</sup> Assent to this seems to be a necessary precondition to theorizing about non-statistical normality and so is perfectly neutral between accounts of normality. Either way, I think at least Nickel would agree with this minimal characterization.

<sup>33</sup> See Ariel Cohen, 'Generics, Frequency Adverbs, and Probability', *Linguistics and Philosophy* 22 (1999), 221–253 for a sophisticated attempt. Cf. Ströβner, op. cit. as well.

This is all salubrious for the explanatory link account, which thinks that the explanation of the presence of normal properties is disconnected in important ways from what it is to be a normal property. A link account holds that normality is logically prior to the actual population of members of the kind. In a slogan: no kinds without normality.<sup>34</sup> Nickel thinks kinds are out there and normality is grounded in explanations attaching to those kinds. This, I think, spells trouble for his account.

On final analysis, then Nickel needs to do more to show that the experts that we're supposed to defer to in picking out normality-grounding explanations aren't themselves contaminated with normality. Regardless of the success of this enterprise, link accounts side step the whole problem and so are better for it.<sup>35</sup>

#### 4. The Explanatory Account of Normality

The explanatory link account of normality relies on the intuition that when a normal outcome obtains, it is *explained* by the kind of thing for which it obtains. Dispositions and functions and the like are posited in part *in order to explain* the outcomes that regularly occur for their possessors, so of course whenever a normal outcome obtains (in the normal way), it will be explained by the disposition or function or the like. Furthermore, citing a disposition or function or the like is often *typing* the possessor of that disposition or function or the like by the kind for which that disposition or function or the like is characteristic if not constitutive. In the case of a normal outcome, therefore, we need only cite the kind of thing in question in order to explain the outcome. Why did that thing turn on when that button was pressed? Well, that's a computer and that's its 'on' button

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<sup>34</sup> The converse is also true: there is no normality if there are no kinds. I think most would agree with this assessment.

<sup>35</sup> More broadly, I'm tempted to think that our conception of normality should illuminate what biologists are up to rather than the other way around, but one can see the merits in thinking the reverse. Note that biology will be one way we answer questions about what is normal for a given species, and why a property is normal for a given species, but I don't expect it to also play a role in our conception of what it is to be normal.

(part of being a computer is being disposed to spring into action at the pressing of one's 'on' button). Why does that thing have four legs? Well, it's a dog and dogs have four legs. Why is he here at 2pm? That's Dev, he's normally in his office at 2pm<sup>36</sup> (Dev's diachronic dispositional profile – part of his nature – explains his being in the office at 2pm). Why does this muscle group constrict like that? That's a heart, and hearts (constitutively) constrict rhythmically in order to pump blood.

Kind explanation – the citing of a kind or the (modally and temporally extended) nature of an individual as the *explaniens* – is closely related to Aristotle's 'formal explanation', where citing the kind of thing – the same as citing the thing's essence – explains a given feature of the thing.<sup>37</sup> To get onto the intuition behind formal explanation, it's best to think about the opposition between formal explanation and material explanations. Certain facts about me obtain because I am a human – being a human explains why I am the way I am. Other facts, though, obtain because I am a human with a particular body with a particular history and with particular abnormalities and oddities. That I have a scar in my left eyebrow isn't explained by my being a human, it's instead explained by my having run face-first into the corner of a table in kindergarten – a particular fact about my history.<sup>38</sup> The fact that a tree has one ring that is significantly thinner than the rest isn't explained by its being a tree, it's explained by its having insufficient material resources during one year of its development. Seeing that there is a contrast here helps us to get onto the intuition that there's a form of explanation that appeals as an *explaniens* to the kind of thing involved.

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<sup>36</sup> It is interesting to note that we often use phrases like 'he's always in his office at 2pm' to express a normality judgment. We clearly, when pressed, don't mean such statements as universal statements – even with a suitably restricted domain that rules out weekends and work holidays – since we are likely well aware that Dev is sometimes sick or on vacation or at the birth of his child on work days.

<sup>37</sup> Aristotle offers the somewhat unhelpful example of citing the fact that an octave in music is a numerical relation in order to explain certain facts about octaves. This is far from the most helpful example available. (*Physics* II 3, 194b24)

<sup>38</sup> Furthermore, certain facts about me obtain because I am *who* I am and not because of some accidental fact about me – like my running into a table and scarring my brow. For instance, it seems true that I pursued a PhD in Philosophy *because that's the kind of person I am* or because I am Me and not someone else.

But the claim here isn't that only *essential* features are explained by the kind of thing involved (or the nature of the individual). Instead the claim is more liberal – that *normal* features are the features explained by the kind of thing involved. Some of these '*per se*' or principled features are *necessary*: some (the constitutive) are part of what it means to be a kind of thing as is (according to Aristotle) being sensitive a part of being an animal; others (the *propria* or proper in the sense of exclusive possession) are not constitutive of being that sort of thing, but nevertheless are always found in subjects of that kind and are only found in subjects of that kind as is the feature of having angles equal to 180°; still others (the generic) are necessary preconditions of being a member of that kind – and so are necessary but neither *propria* nor constitutive – as is being physically extended for being an animal.<sup>39</sup> There are also non-necessary but 'natural' or 'proper' (now in the evaluative sense of the word) features of members of a kind which are still had in virtue of being a member of the kind and so still *per se* features. An example of the natural is that of being a friend for the kind humans. The fullest and best human lives are ones in which one has friends, but one can go one's whole life without having a friend without threat to one's status as a human being (though perhaps Aristotle will question one's *humanity* or status as a full member of the species). Still others are merely *unique* to the kind for which they are *per se*. Humans are the only things (that we know of) that can find treasure<sup>40</sup> or have wine cellars.<sup>41</sup> All of these *per se* features, activities, and conditions are normal on the account under analysis here. The view therefore might be characterized as the view that the normal outcomes are the non-accidental or principled outcomes.

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<sup>39</sup> How can a *necessary* feature be nevertheless *normal*? Well, remember that the distinction between necessities and normalities *qua* types of relations between kinds and features

<sup>40</sup> Is a raccoon stumbling upon a squirrel's nut cache a raccoon *finding treasure*? I'm not so sure. What I am sure of is that if I say, 'treasure was discovered in my back yard', one won't immediately think of squirrels but will instead normally think of human contexts.

<sup>41</sup> Both examples and the overall thought thanks to Gavin Lawrence.

What to make of ‘explain’ here, though, when this word is now famously polysemous at best and hopelessly ambiguous at worst? For our purposes, we can get a lot of latitude out of the concept by staying at a fairly naïve level. Explanations are or are expressed by answers to ‘why’ questions, which themselves express or are calls for explanations. For one to give an explanation, therefore, is for one to answer an implicit or explicit ‘why’ question – which will determine which kind of explanation is appropriate, perhaps by explicitly or implicitly furnishing the contrast class for the explanandum.<sup>42</sup> So explanation has a pragmatic element, but perhaps is something over and above a pragmatic process.<sup>43</sup> Because here we’re interested in understanding the mystery of normality by appeal to concepts that we understand better, it doesn’t profit us to get bogged down in the mysteries surrounding the concept of explanation if we have an intuitively accessible naïve account of what explanation is (so long as our naïve account isn’t incoherent). That is to say: I take it that we already have an intuitive understanding of what it means to give an explanation of some phenomenon (beyond the pragmatics of answering ‘why’ questions) and I take it furthermore that this understanding is more accessible to us than is our intuitive understanding of normality.

Having as we now do some motivation for the explanatory link account and some intuitive idea of how it might work, let us begin with an initial account and build toward something stricter:

(Explanatory Link<sub>1</sub>) Normal outcomes are those which are explained by the kind of thing for which they obtain.

Some features of a thing are had *insofar as* it is a certain kind of thing, while others are had insofar as it is a different kind of thing. As a human, it’s incidental that one fail to aspirate one’s H’s. As a New Yorker, though, it’s normal or part of the kind in question – i.e. non-accidental.

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<sup>42</sup> Cf. for example, Bas Van Fraassen, ‘The Pragmatics of Explanation’, *American Philosophical Quarterly* 14:2 (1977), 143–150; and ‘The Pragmatic Theory of Explanation’, *The Scientific Image* 5 (1980), 97–157 for a discussion of the contrastive nature of causation and therefore likely of explanation in general.

<sup>43</sup> Whereas Van Fraassen (‘The pragmatic Theory of Explanation’) thinks that an explanation is an answer to a why-question and that’s all, I am skeptical of such a view. Explanations are answers to why-questions, but perhaps they are other things as well (relations between facts, for instance).

This account faces an immediate problem: some explanations are ‘indirect’. My being a human in some sense explains a runner tripping over me. Humans are solid objects and so my being a human as opposed to being a puddle explains why that runner who ran into me as I laid reading in a field *tripped* rather than *got wet*. But we wouldn’t want to claim that it’s normal for humans to trip runners. It might not be abnormal, but it is intuitively too strong to say that it’s *normal*.<sup>44</sup> With this sort of case in mind, let us posit the distinction between *direct* and *indirect* explanation.

Indirect kind explanation is explanation that cites a kind (or a specification of an entity) as the *explanans* but which has explanatory force *in virtue of* that kind bearing some connection to another kind – the kind which by itself would serve as an *explanans*. Whatever explanatory force there is in saying that I tripped the runner because I’m a human being is had in virtue of the fact that human beings are solid objects and not liquid or gaseous objects. A direct kind explanation, alternatively, is one that cites the kind that gives the explanation its explanatory force. With this distinction in mind, let us make the following revision to our account:

(Explanatory Link<sub>2</sub>) Normal outcomes are those which are directly explained by the kind of thing for which they obtain.

In adding the condition that the explanation in question be direct, we avoid cases where the connection between the kind of thing in question and the outcome is incidental.

One might worry at this point about the following kinds of cases:

(Adoption) Katie really likes dogs and wants to adopt a dog. She adopts Leeroy. Leeroy’s being adopted by Katie is explained directly by Leeroy’s being a dog. After all, Katie was set on adopting a dog rather than a cat or mongoose.

This is at least an apparent problem because the explanatory link account seems to entail that it’s normal for Leeroy to get adopted by Katie.<sup>45</sup> ‘Leeroy gets adopted by Katie’ sounds even stranger to

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<sup>44</sup> There seem to be many examples of properties which are neither normal nor abnormal. Cambridge properties seem mostly to be neutral with respect to normality, as is the property of painting one’s skin green – it’s not a normal thing to do, but it’s too strong to say that it’s *abnormal*.

<sup>45</sup> Thanks to Katrina Elliot for raising these worries.

our ears. Intuitively, there's no regularity here that could be a normality – a connection between some general entity and a feature – and so it can't be normal for Leeroy to get adopted by Katie. Part of the strangeness is that it's a relation between individuals and so appears to be at best a one-off case instead of a regularity and it seems like normalities have to be at least potentially regularities.

There's a lot to say, so it will be best to say each quickly. First, we need to get clear on the contrasts implicit in the context. 'Leeroy getting adopted by Katie rather than Missy the cat getting adopted by Katie' is one plausible contrast, and 'Leeroy getting adopted by Katie rather than Kitty the cat lover' is another potential contrast. Leeroy's being a dog, it seems, explains the explanandum in both cases. However, the question might have been 'why did Leeroy the Labrador rather than Rufus the Rottweiler get adopted by Katie?' to which the response 'because he's a dog' sounds otiose. We'll have to appeal to Leeroy's special or individual qualities to answer the question.

Second, we must pay careful attention to the work that tense does here. It might sound odd to say, 'it's normal for Leeroy to get adopted by Katie', but it won't sound as odd to say 'it *was* normal for Leeroy to get adopted by Katie.' This doesn't quite alleviate the worry that one-off events can't really be normalities, but it gets us some way towards understanding what is going on in this case.

Finally, it seems that perhaps the specification of the beings in question might have gone wrong. Is it normal that Leeroy got adopted by Katie or is it normal that Leeroy got adopted by a dog lover? Is it normal that Katie adopted Leeroy or is it normal that Katie adopted a dog? Again, contrasts are important to track. If the question is about why Leeroy was adopted by Katie rather than Missy the cat, then the answer will be 'because Leeroy's a dog'. If the question is about why Leeroy was adopted by Katie rather than Kitty the cat lover, then Katie's being a dog lover is relevant to answering the question. 'It's normal for Katie to adopt dogs' seems like a perfectly good judgment and a true one at that – especially if we subjunctivize it to 'it would be normal for Katie to adopt a dog'. 'It's normal for dogs to get adopted by dog lovers' is certainly just as good. 'It'd be normal for

Leeroy to be adopted by someone who is attracted to his upbeat energy and peerless loyalty' also rings true.

It's less clear, this far into the analysis, that 'it's normal for Leeroy to be adopted by Katie' is a bullet that needs to be bitten by the Explanatory Link theorist because the normality in question seems not to be between individuals (or an individual and a property which makes reference to another individual) but between an individual and a general entity akin to a kind. Once we've gotten clear on the contrasts, we'll have abstracted away from an individual-individual relationship to something that looks more like an individual-kind relationship and that's the sort of thing that can uncontroversially be called a normality. The individual-individual explanations, it seems, are indirect explanations.

Now that the basic view is on the table, it is time to test whether it accounts for the core features of normality judgments. Let's rehearse those features:

(Tolerance) Normality judgments all tolerate (remain true in spite of) exceptions to the corresponding universally quantified judgment. That is, they don't have straightforward counterexamples.

(Insensitivity) Normality judgments are all *relatively* insensitive to changes in the prevalence of the relevant outcome in the population over which they generalize.

(Normativity)(?) Normality judgments entail that any individual over which they generalize, insofar as it is a member of the relevant kind, *should* have the outcome being attributed.

The explanatory account of normality judgments tells us why they should be tolerant: if the relevant feature *would* be explained by the kind *were* it to obtain, then there's simply no entailment that it should obtain in *any* particular circumstance (or potentially any *proportion* of particular circumstances). We can also account for why they should be insensitive: there aren't clearly any principles governing how many outcomes should be explained by the kind for which that outcome is normal—a rare, but normal spotted zebra has markings that are explained by its being the sort of thing it is even though one wouldn't therefore expect any particular prevalence of spottedness to follow. This is what we'd

expect pretheoretically given commonly-held intuitions about the lax relationship between normality and prevalence.

Some normality claims also seem to be *normative* in inferential structure: at least certain normative generalizations entail *should* claims for the individuals over which they generalize. The explanatory account of normality accounts for this, but in a roundabout way. On this account, having some feature is normal for one insofar as one is an *f* if and only if having that feature will be explained by one's being an *f*. If one fails to have a feature that *would* be explained by one's being an *f*, then it's natural to think that being an *f* won't explain one's *not* having that feature (though this isn't an entailment). Given that we need an explanation for such an outcome, we'll have to look elsewhere from the standard 'x is an *f* explanation normally available to us. We'll have to look at *what went wrong*.

Now, the shift from explanation to something going wrong isn't yet warranted. Why not simply think that we won't appeal to the kind *f*, but we can appeal to a different kind *k*? Or, alternatively, why not think that we can simply point to something that was *irregular* or *uncommon* to explain the abnormal outcome? Obviously, there is a lot of work to do here. Quickly, though, in the context of an explanation, things are specified according as they help bring about some state of affairs. And, insofar as they are so specified, it is a *bad* for them not to bring about that state of affairs. A stepping stone *qua* rock doesn't 'care' how stable it is, but *qua* stepping stone it is important to its success as a stepping stone that it be stable. Something will have gone wrong at some level if the normal outcome fails to obtain because in our explanatory practices we'll be looking for what it was that – at least analogously – went *wrong*.<sup>46</sup>

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<sup>46</sup> Some normalities – 'complete normalities' – are such that they will obtain absent interference, while others – 'incomplete normalities' – are such that if they obtain they will be normal, but there is no reason to think they will in fact obtain unless we have more information than the kind for which they are normal. The normative inferential profile can in principle only apply to complete normalities. There is no normative pressure toward the obtaining of an incomplete normality: a cat can be calico, black, white, or orange tabby without anything going wrong. In fact, those are

In addition to offering a successful account of functionals, trajectory claims, and characterizing claims, the Explanatory Link Account can also deal with less central cases. A habitual is a normality judgment on this account because Dev's work habits *explain* why he's in fact in his office at 2pm, but does not *entail* that he will be in his office at 2pm. Moreover, a disposition *explains* a particular outcome – such as a computer powering on – when that outcome occurs, but again does not entail that the disposed computer will *in fact* do such a thing.

We thus have an account that appears to cover the focal cases we set out to account for and has the potential to cover many more types of normality judgments. With that in mind, we've got a *prima facie* successful account of the content of normality judgments.

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*all* normal outcomes. So to make an inference to a 'should' claim about an individual from an incomplete normality judgment would be an error in reasoning.