Compatibilism about Coincidence[*]

Thomas Sattig
Washington University in St. Louis

It seems to be a platitude of common sense that distinct ordinary objects cannot coincide, that they cannot fit into the same place nor be composed of the same parts at the same time. The paradoxes of coincidence are instances of a breakdown of this platitude in light of counter-examples that are licensed by innocuous assumptions about particular sorts of ordinary object. Since both the anti-coincidence principle and the assumptions driving the counter-examples flow from the folk conception of ordinary objects, the paradoxes threaten this conception with inconsistency.

Typical approaches to the paradoxes reject the anti-coincidence principle or some portion of the assumptions driving the counter-examples, thereby partially revising our common conception of the world around us. This paper offers a compatibilist solution to the paradoxes that sustains the folk conception of ordinary objects in its entirety. According to this solution, the various cases of distinct coincidents do not clash with the anti-coincidence principle, since the cases and the principle manifest different yet compatible perspectives on the world.

1 Conflict

Let us say that an object x *coincides* with an object y at time $t =_{df} x$ and y (exactly) occupy the same place at t, and x and y have the same microphysical parts at t.[1] Let us further say that ordinary objects are the things

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[1]If sharing microphysical parts at a time entails sharing exact location at that time, then the first clause in the definiens is redundant.

to which ordinary sortal terms, such as 'person', 'chair', 'cat', 'mountain', 'piece of paper', 'lump of tissue' and 'hunk of wood' apply. Under the actual laws of nature, how many ordinary objects fit exactly into a given region of space at a time? And how many ordinary objects can be composed of a given collection of microphysical particles at a time? According to pre-philosophical opinion, the answer to both questions would seem to be *one*. In other words, distinct ordinary objects cannot coincide. The following anti-coincidence principle thus appears to rank as a platitude of common sense:

(AC) Necessarily, for any ordinary objects o and o^*, and for any time t, if o coincides with o^* at t, then o is identical with o^*.[2]

This principle seems to have a number of compelling counter-examples, giving rise to the paradoxes of coincidence. What follows are five cases, (A)-(E), supporting the coincidence of distinct ordinary objects under the actual laws of nature. Cases (A), (B) and (E) are cases of coincidence of distinct objects falling under different sorts, whereas cases (C) and (D) are cases of coincidence of distinct objects falling under the same sort. Moreover, cases (A)-(D) establish the distinctness of coinciding objects on the basis of differences between these objects at times other than the time of coincidence, whereas case (E) establishes the distinctness of coinciding objects on the basis of differences between the objects at the time of coincidence.[3]

1.1 Cases

(A)
A child builds a paper airplane by folding a piece of paper in a certain way. Once the folding process is completed, there is a paper plane and there is

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[2]Restricting the principle to ordinary objects and nomological necessity leaves room for the coincidence of distinct fundamental particles and of distinct universals or tropes under the actual laws of nature, as well as for the coincidence of distinct ordinary objects under exotic, merely possible laws of nature which allow persons and cars to pass through each other.

[3]While the upcoming selection of cases covers considerable ground, it is not exhaustive. In particular, no cases are included that establish the distinctness of coinciding objects on the basis of differences between these objects at possible worlds other than the world of coincidence. The reason is that while the kind of treatment to be proposed for the temporal cases is expected to be extendable to the modal cases, the modal cases are expected to require a different technical background (see footnotes 25 and 36 below). The most prominent of the modal cases of coincidence is Allan Gibbard's case of Lumpl and Goliath, in Gibbard 1975.

a piece of paper. While the piece of paper existed before the child went to work, the paper plane did not. By Leibniz's Law, which says that identical objects must share all their attributes, it follows that the paper plane is distinct from the piece of paper. Yet the paper plane and the piece of paper are ordinary spatio-temporally extended artifacts that exactly occupy the same places over the period of time during which the paper plane traverses the skies, and that have the same microphysical parts during that period. Hence, the paper plane and the piece of paper are distinct, coinciding artifacts.

(B)
Tibbles is a cat, whereas Tib is a lump of feline tissue consisting of all of Tibbles except for her tail. By Leibniz's Law, Tibbles and Tib are distinct objects. Now suppose that Tibbles loses her tail. Since a cat can survive the loss of certain parts, such as tails, Tibbles survives. Moreover, since nothing happens to Tib apart from having something external detached from it, Tib survives as well. Since both Tibbles and Tib survive, and since both Tibbles and Tib are ordinary spatio-temporally extended objects that exactly occupy the same place and have the same microphysical parts after the tail is detached, distinct ordinary objects coincide at that time.

(C)
Suppose with Kit Fine that Bruce writes a letter to his wife Bertha on a piece of paper.[4] Upon receiving the letter, Bertha writes a letter to Bruce on the other side of the same piece of paper without affecting what Bruce had written. As a consequence, there is a letter that Bruce wrote and a letter that Bertha wrote. Is the former identical with the latter? It seems not. For a letter typically comes into existence when it is written. Bruce writes a letter at one time, Bertha writes a letter at another time. Since one cannot write a letter that exists already, Bertha's letter is distinct from Bruce's letter. So we have two letters. Moreover, since Bruce's letter is not destroyed when Bertha writes hers, Bertha's letter and Bruce's letter co-exist at various times. As Fine points out, these letters have all the standard attributes of ordinary spatio-temporally extended objects; "they can be stacked, weighed, damaged, destroyed, and so on". Further, it is plausible to say that at any time at which either letter exists, its exact location is the location of the piece of paper on which it is written, and its microphysical parts are the microphysical parts of that piece of paper. As in case (A), we

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[4]See Fine 2000.

have coincidence of distinct artifacts. But this time the artifacts belong to the same sort.

(D)

A human organism lives for a thousand years. During this time span it undergoes perpetual psychological change, to the effect that its early memories and character traits fade gradually and are eventually replaced by completely different memories and character traits. The organism ends up lacking any psychological connection with its earlier stages across long periods of time.[5] Where there is a human organism with higher-order mental capacities, there is a person constituted by this organism.[6] Suppose that the organism at time t constitutes a person P, and that the organism at a time 800 years later than t constitutes a person P^*. Is P identical with P^*? The answer seems to be *no*, given that psychological connectedness has faded away completely. So personal identity seems to require psychological connectedness: a person P at t_1 is identical with a person P^* at t_2 only if P at t_1 is psychologically connected to P^* at t_2. Let us follow David Lewis in stipulating that psychological connectedness has a maximal span of 137 years.[7] Then no person persists through a span of more than 137 years. Let us further assume that for every span of 137 years or less lived by our organism, some person persists through that span. Given that the organism persists from 1900 to 2100, some person, P, persists from 1900 to 2000, and some person, P^*, persists from 2000 to 2100. Since no person persists from 1900 to 2100, P and P^* are distinct. On the plausible assumption that each person constituted by the organism at time t exactly occupies the place occupied by the organism at t, and is composed of the same microphysical parts the organism is composed of at t, it follows that P and P^* are distinct persons coinciding in year 2000. Moreover, since year

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[5]There is a standard distinction between psychological connectedness and psychological continuity in the literature on personal identity. Stages of an organism are psychologically connected if they are psychologically similar to a certain minimal degree; they share at least some memories and character traits. Stages of an organism are psychologically continuous if they are connected by a chain of stages, such that adjacent stages in the chain are massively psychologically similar. The present case stresses connectedness. I shall employ both notions in Section 2.1.

[6]In this context, the relation of constitution is invoked without philosophical ambition, and accordingly its nature is left unspecified. By analogy with the treatment of the relationship of the paper plane and the piece of paper to be proposed in the following sections, it will turn out that constitution is not identity. At any rate, as long as we are dealing with the case of the long-lived organism, issues regarding the relationship between a person and the organism it constitutes may be set aside.

[7]See Lewis 1983, 66.

2000 is part of infinitely many 137-year spans, we must admit that infinitely many persons coincide then.[8]

(E)

A chair is built from a piece of wood. Once the building process is completed, there is a chair and a coincident piece of wood. The chair has artifactual as well as physical properties: in addition to having a certain shape, mass and decomposition, it is functionally defective. The piece of wood, on the other hand, is not defective. Hence, the chair and the piece of wood are distinct, coinciding objects.[9] In the previous cases, coincidence of distinct objects is established on the basis of a difference in temporal extension, a diachronic difference; one of the coinciding objects comes into or goes out of existence before the other does. In the present case, coincidence of distinct objects is established on the basis of a difference obtaining at the same time, a synchronic difference.

1.2   Pluralism and monism

Resolving the apparent conflict between the anti-coincidence principle (AC) and the various cases of distinct coincidents is usually thought to require a choice between rejecting the principle and denying the plausibility of the cases, a choice between *pluralism* and *monism*.[10] Responses to the paradoxes of coincidence differ further with respect to their scope of application. An important question is whether the response is *unified*—that is, whether it works both for cases of coincidence of distinct objects of different sorts and for cases of coincidence of distinct objects of the same sort, and whether it works both for diachronic cases of coincidence and for synchronic cases of coincidence.

Pluralists accept at least some of the cases of coincidence and reject the compelling principle (AC). Such rejection is typically accompanied by a philosophical recipe for living with deviance from common sense, a meta-

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[8]This type of case is discussed in Parfit 1975, 217-19 and Lewis 1983, 65-7. A modal case closely related to this one is "Chisholm's Paradox"; see Chisholm 1968. I shall set aside doubts about the empirical basis of the long-lived organism case and assume that it is nomologically possible, rendering it maximally disturbing in light of the construal of (AC) as a claim of nomological necessity. Metaphysicians worried about coincidence should face this type of case head-on, in order to avoid giving hostage to empirical fortune.

[9]Or consider again the two letters introduced in (C). One letter is addressed to Bruce, the other to Bertha; one letter is written on the front side of the paper, the other is written on the back. See Fine 2003, 206 for more examples of this type.

[10]I borrow the terms 'pluralism' and 'monism' from Fine 2003.

physical framework in which the coincidence of distinct ordinary objects may be illuminated and tolerated. One pluralist approach is the three-dimensionalist account of coincidence as constitution, whose centerpiece is an explication of the constitution relation. According to this approach, the paper plane and the piece of paper of case (A) coincide at a time in virtue of the piece of paper constituting the paper plane. Likewise, Tib constitutes Tibbles in case (B), and the piece of wood constitutes the chair in case (E). As regards the issue of scope, typical proponents of the constitution account acknowledge that it only applies to cases of coincidence involving objects of different sorts, and hence that cases involving a single sort require a different approach.[11]

Another pluralist approach is the four-dimensionalist account of coincidence as temporal overlap, according to which distinct ordinary objects, such as the paper plane and the piece of paper of case (A) or Tibbles and Tib of case (B), coincide at a time in virtue of sharing a common temporal part at that time. While the temporal-parts account handles distinct coincidents of the same sort as easily as it handles distinct coincidents of different sorts, the account is still limited in scope, since it only applies to diachronic cases of coincidence, leaving synchronic cases in the dark. The problem for the temporal-parts strategy of accepting but deflating distinct coincidents is that the account fails to capture the qualitative difference between the chair and the piece of wood in case (E), given that sharing a temporal part at a time results in sharing all attributes at that time. A different type of resolution is needed in this case.[12]

Monists accept (AC) and reject one or more assumptions driving the cases of coincidence. A prominent monist approach is the dominant-sorts view, according to which an ordinary object may belong to different sorts, only one of which is dominant. The dominant sort of the object is the one that determines the object's persistence conditions. As applied to case (A), this account manages to reduce the number of artifacts present at each time to one by rejecting the seemingly innocuous assumption that the piece of paper making up the paper plane is identical with the original unfolded piece of paper; folding a piece of paper in the right way destroys the latter. Likewise, the account rejects the assumption of case (B) that the lump of tissue survives the removal of Tibbles' tail, a removal of a mere external

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[11]Three-dimensionalist pluralists follow the lead of Wiggins (1968 and 2001). For two prominent explications of the constitution relation, see Baker 2000 and Thomson 1998.

[12]Four-dimensionalist pluralists follow the lead of Lewis (1983). While not fully unified, the four-dimensionalist account presented in Sider 2001, Chapter 5 is a pluralist account of all the diachronic paradoxes.

attachment. The dominant-sorts account is limited in scope, in virtue of applying only to cases of coincidence involving objects of different sorts. It is, moreover, unclear how synchronic cases of coincidence are to be treated within this framework.[13]

Another monist approach is the sortal-relativity account, according to which an object has attributes that are relativized to different sorts under which the object falls. In case (A), one and the same object is both a piece of paper and a paper plane. This object exists at t *qua* piece of paper, whereas it fails to exist at t *qua* paper plane. Similarly for case (E). One and the same object is both a chair and a piece of wood. This object is defective *qua* chair but fails to be defective *qua* piece of wood. Conflict with Leibniz's Law is avoided in both cases, because the different sortal-relative attributes are compatible. This way of avoiding conflict, however, creates some tension with unreflective common sense. There is an artifact that is present at time t, and there is an artifact that is absent at t. Without a doubt, the philosophically uninitiated will infer that we are dealing with distinct artifacts, taking for granted that presence at t and absence at t are incompatible properties. The friend of sortal relativity does not permit the naïve inference, as presence at t and absence at t may turn out to be compatible properties, depending on how they are sortally relativized.

As regards scope, the sortal-relativity account is severely limited. First, the account does not apply to case (B). Tibbles and Tib are distinct, because one has a tail that the other lacks. So there are two objects. Since both objects survive the tail-removal, and both objects end up in the same spatial region, p, at t, there should be at least two objects in region p at t. This description of the case seems innocuous. Yet monists insist that region p contains a single object at t. It is entirely unclear how sortal-relative attributes are supposed to help with this seemingly inconsistent scenario. Secondly, the account does not cover all cases of same-sort coincidence. Consider case (C). A letter L exists at t_1 and at t_2, and a coinciding letter L^* exists at t_2 but not at t_1. If L and L^* are the same object, then this object both exists and fails to exist at t_1. Throwing sortal relativity into the mix, to the effect that L/L^* exists at t_1 *qua* letter and does not exist at t_1 *qua* letter, fails to alleviate the threat of inconsistency. Moreover, enriching the sortal modifiers, to the effect that L/L^* exists at t_1 *qua* letter to Bertha but fails to exist at t_1 *qua* letter to Bruce, provides a temporary remedy at best. For suppose that Bertha returns the original letter to Bruce without a response. As a result, Bruce tries again and writes another letter to Bertha

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[13]For the dominant-sorts view, see Burke 1994.

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on the back of the original. Then we have two coinciding letters to Bertha, and hence a single material object that exists at t_1 *qua* letter to Bertha, and that also fails to exist at t_1 *qua* letter to Bertha. Contradiction reinstated. In general, for any enriched sortal term +K, if cases of distinct, coincident Ks are possible, then cases of distinct, coincident +Ks cannot be ruled out easily.[14]

1.3 Compatibilism

Traditionally the debate over the paradoxes of coincidence has been a debate between pluralists and monists, a debate framed by the quiet concession that the folk conception of ordinary objects is unstable. If an established scientific theory contradicts the anti-coincidence principle, then the folk conception of ordinary objects is probably false. If, on the other hand, cases (A)-(E) contradict the anti-coincidence principle, then the folk conception is inconsistent, since the assumptions driving the counter-examples themselves flow from this conception. My aim in this paper is to save the folk conception of ordinary objects from inconsistency in the face of coincidence. Thus I shall argue that this conception can be preserved in its entirety; no revision is required. For those who are compelled to accept the outcome of the cases of coincidence, and who also take seriously the platitude of common sense that no distinct ordinary objects can ever coincide, I shall offer a *compatibilist* way out of the conflict: properly understood, there is no conflict; the cases and the platitude are compatible. I shall steer away from the traditional metaphysical dispute between monists and pluralists, by arguing that monist and pluralist intuitions do not register incompatible metaphysical features of the world, but rather manifest different yet compatible perspectives on the world. Furthermore, this solution to the paradoxes of coincidence will be unified; all of the mentioned cases will be shown to be compatible with the anti-coincidence principle on the same grounds.[15] In Section 2, I shall sketch

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[14]Friends of sortal relativity include Gibbard (1975), Gupta (1980), and Lewis (1968 and 1971), although their focus is on modality. Lewis's counterpart theory has been "temporalized" by Sider (2001, Section 5.8). For a recent discussion that questions the viability of sortal relativity as a hypothesis about ordinary language, see Fine 2003. For responses, see Frances 2006 and King 2006.

[15]My aim is to show that the outcome of cases (A)-(E) *may* plausibly be accepted in the presence of (AC), not that they *should* be accepted. Therefore I shall rest content with the way in which the cases are presented here and refrain from discussion of doubts about the "data". Moreover, as the list of puzzle cases is not exhaustive, more work is required to show that the solution to be proposed is truly unified. This work, however, lies beyond the scope of the present paper.

a metaphysical account of ordinary objects as well as a semantic account of discourse about ordinary objects. In Section 3, I shall employ this apparatus in dissolving the conflict.

2 Apparatus

I shall paint a picture of the language and reality of ordinary objects with the following outline. Ordinary objects are double-layered logical constructions. The different layers permit different perspectives on the world of objects; and ordinary discourse about objects employs different modes of predication that correspond to these perspectives. I shall begin with the metaphysics and then turn to the semantics.

2.1 Ordinary objects as compounds

Ordinary objects include persons, chairs, cats and mountains, but also lumps of tissue, pieces of paper and hunks of wood. What follows is a sketch of a metaphysical picture of ordinary objects, a picture with a distant Aristotelian flavor, according to which ordinary objects are compounds of material objects and K-paths.

2.1.1 Material objects

There is a basic, non-derivative sense of existing at a time, or instant, of occupying a place at a time, and of having a property at a time. A *material object* is a thing that exists at times, occupies places at times, and has properties at times in this basic sense. I shall assume that there are material objects, and that material objects obey the mereological principles of atomism, universalism and extensionality. a) Atomism: any material object a that exists at any time t is either an *atom* at t—an object without any proper parts at t—or composed of atoms at t.[16] b) Universalism: for any plurality of material objects, the xs, existing at a time t, there is a further material object that is composed of the xs at t. c) Extensionality: composite material objects are individuated mereologically; sameness of the parts of composite material objects a and b is necessary and sufficient for the identity of a and b:

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[16]Objects a and b *overlap* at t iff they share a part in common at t. And a plurality of material objects, the xs, *compose* an object a at t iff every x is a part of a at t, and every part of a at t overlaps an x at t.

(M) Necessarily, for any composite material objects a and b, a is identical with b iff for any times t and t^* and for any pluralities of xs and ys, if a is composed of the xs at t and b is composed of the ys at t^*, then the xs are the same as the ys.

Four points of clarification about (M). First, by (M), coincidence at t, which was earlier defined in terms of the complete sharing of microphysical parts at t, implies identity. By (M), distinct material objects cannot coincide at any time. (The significance of this consequence will become apparent later.) Second, (M) implies that a material object cannot change in parts over time; the parts go where it goes. If a material object a is composed of the xs at any time of its existence, then a is composed of the xs at all times of its existence.[17] Third, given universalism, (M) implies that a material object can survive radical scattering; it goes where the parts go. If the xs compose material object a at any time, then they compose a when the xs are spatially close together, jointly exhibiting, say, the shape of a cat, but also when the xs are scattered across the universe. Fourth, (M) is a principle about material objects, not about ordinary objects. To hold (M) is thus not automatically to deprive a cat of the ability to survive the loss of a tail, or to allow a cat to survive radical spatial separation of its parts. As we will see, mereological change and unity of ordinary objects are compatible with (M). This is why extensionality about material objects, even in combination with universalism, is harmless by the lights of common sense.[18]

To conclude the characterization of material objects, let me emphasize that the present point of adducing the principles of atomism, universalism and extensionality is to provide a transparent and well-understood foundation for a metaphysical account of ordinary objects that supports a compatibilist solution to the paradoxes of coincidence. This desideratum is satisfied by the mereological principles, but it may perhaps be satisfied by alternative, non-mereological principles, as well.

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[17]The doctrine that sameness of parts is necessary for identity is known as mereological essentialism. This doctrine was popular among a number of 18th-century philosophers, including Leibniz (1982), Butler and Reid (see the excerpts in Perry 1975). More recently the doctrine was defended by Chisholm (1976: App. B) and van Cleve (1986).

[18]Those still worried about radically scattered material objects may want to reject mereological universalism and adopt some form of restriction on composition. Principles of composition such as universalism deserve more attention than I shall be able to afford them here. See van Inwagen 1990.

2.1.2 K-paths

For any ordinary sortal noun K, such as 'chair', 'cat' or 'person', there is a range of properties that can meaningfully be ascribed to Ks.[19] A chair, for example, can meaningfully be ascribed artifactual as well as physical properties—in addition to having a certain shape, mass and decomposition, it may be functionally defective or well-designed—though a piece of wood may not meaningfully be said to have such artifactual properties in addition to its physical ones. In general, an ordinary sortal noun is associated with a characteristic range of properties, its "sphere of discourse". These are the properties that have meaningful application to objects falling under the sortal.[20] The sortals 'chair' and 'piece of wood' have different spheres of discourse.

Many properties in the sphere of discourse of K are not defining features of K. The material constitution of a chair is not what makes it a chair; but its shape is what makes it a chair. In addition to its sphere of discourse, a sortal noun K is associated with a range of properties that *realize* K-hood. In the case of chairhood, there is a cluster of shapes, such that each shape in the cluster realizes chairhood. In the case of personhood, there is a cluster of mental profiles, such that each profile in the cluster realizes personhood.

A *K-state* of a material object a is a complex, conjunctive fact about a that obtains at a particular time:[21] it is the maximal conjunction of the facts that a exists at t, that a has ϕ_1 at t, that a has ϕ_2 at t, ..., that a has ϕ_n at t, such that (i) each ϕ_i is an intrinsic property of a at t, (ii) each ϕ_i falls in the sphere of discourse of the sortal noun K, and (iii) a subset of ϕ_1, ϕ_2, ..., ϕ_n realize K-hood. A chair-state thus has artifactual as well as physical facts about an object as conjuncts, whereas a piece-of-wood-state has physical but no artifactual facts about an object as conjuncts. Notice that a chair-state and a piece-of-wood-state may be complex facts about the same material object.

A *K-path* is a maximal conjunction of K-states, of the same or distinct material objects, that obtain at different times and that are interrelated by

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[19] A precise characterization of sortal terms is desirable. But for present purposes, we may rest content with singling out ordinary sortal terms by example.

[20] See Fine 2003, 207.

[21] I shall make the following minimal assumptions about facts and states of affairs. States of affairs form a *sui generis* ontological category. They are complex entities whose constituents are structured in a certain way. There are basic and non-basic, or molecular, states of affairs. In particular, there are conjunctive states of affairs. The existence of a state of affairs is distinct from its obtaining. Thus, it is open whether there are states of affairs that do not obtain. A fact is a state of affairs that obtains.

similarity and causal dependence. For present purposes, I shall assume that a K-path has a unique K-state at a time. More precisely, for a K-state s, let t_s be the time of s, in the sense that s is a conjunction of facts that obtain at t_s. Then the following condition on K-paths is assumed to hold: If s and s^* are conjuncts of a K-path and $t_s = t_{s*}$, then $s = s^*$. Consider a person-path. First, the included person-states—person-states because they involve the beliefs, character traits and experiences that realize personhood—are interrelated by similarity. The states are psychologically continuous: any two temporally close states in the path are massively psychologically similar; psychological change from one moment to the next is gradual. Moreover, the states are psychologically connected: any two states in the path are psychologically similar to some minimal degree; psychological change over longer periods of time happens within limits.[22] Secondly, the person-states in a person-path are interrelated by lawful causal dependence. If an object's being in a person-state now and an object's having been in a person-state yesterday are included in the same person-path, then the current person-state causally depends on the previous person-state. That is, each person-state in a person-path depends for its character on the person-states before it. The causal relation linking K-states is often called immanent causation.[23] Finally, person-paths are maximal. No segment of a larger conjunction of person-states interrelated by similarity and causal dependence is a person-path. Only the largest conjunction of person-states interrelated in this way counts as a person-path.[24]

Some further terminology. If a fact is a conjunct of a K-state or a K-path, then the fact is *included* in the K-state or the K-path. If a fact that is included in a K-state or a K-path has a property ϕ and a time t as constituents, then the K-state or the K-path *contains* ϕ and t, or simply the temporal property of being ϕ at t. If a K-path includes a plurality of facts that contain incompatible properties of a certain type paired with different times, then the K-path includes a change in this type of property. For example, if a K-path includes the fact that a is composed of the xs at t and the fact that b is composed of the ys at t^*, where the xs are not the ys and t^* is later than t, then the K-path includes a change in parts over time.

While a K-state is an instantaneous, three-dimensional qualitative pro-

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[22]How much similarity is required is a vague matter. Lewis's stipulation in case (D) that psychological connectedness have a maximal span of 137 years is an arbitrary removal of some of this vagueness.

[23]The notion goes back to Lotze 1887. The locus classicus is Johnson 1924. For recent developments, see Swoyer 1984 and Zimmerman 1997.

[24]My constraints on K-paths derive from Lewis 1983, 55-60.

file, a K-path is a cross-temporal, four-dimensional qualitative profile, which includes a particular spatio-temporal trajectory and a particular distribution of facts across this trajectory. Given the nature of material objects as mereologically individuated, the four-dimensional profile, the K-path, is typically not the profile of a single material object. For chair-paths and person-paths include a change of parts over time, whereas material objects cannot change in parts over time. So a K-path, while localized in virtue of including a particular spatio-temporal trajectory, is not tied to a particular material object.[25]

2.1.3   Ordinary objects

Ordinary objects are the things to which ordinary sortal terms apply. As stated above, an ordinary sortal term K carves out a class of K-paths—a class of complex facts unified by similarity in K-relevant respects and causal dependence. I shall say that a material object that is the subject of any fact included in a K-path is a subject of that K-path (not *the* subject, since a K-path typically has many subjects in this sense). Now, an object to which K applies, an ordinary object of kind K, is a *compound*, an ordered pair, of a material object and a K-path, such that the material object is a subject of the K-path. If o is an ordinary object, then for some material object a and some K-path i, $o = \langle a, i \rangle$. Take a particular material object. The latter is a subject of a chair-path. The ordered pair, the compound, of the material object and the chair-path is a chair. In neo-Aristotelian fashion, I shall characterize the component material object as the chair's *underlying matter*, and the component chair-path as the chair's *individual form*. The chair-path is a form of a chair because it contains properties, all of which fall in the sphere of discourse of 'chair' and some of which realize chairhood; and it is an individual form of a chair because it is localized, a distribution of facts across a particular four-dimensional region of spacetime. The material

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[25]A word on the modal profile of K-paths is on order. It is a key feature of K-paths that they include changes, property-variations, across time. This feature, as will become apparent below, is responsible for capturing the intuition that ordinary objects change in various ways over time. As K-paths are conjunctions of *facts*, however, they do not include any changes across possible worlds. For example, a K-path is not allowed to include the states of affairs of a's having ϕ at t and of b's having ψ at t, where ϕ and ψ are incompatible properties, such that one of these states of affairs obtains while the other does not but could obtain. That K-paths do not include qualitative variation across possible worlds has the consequence that the account of temporal predication to be given in Section 2.2 lacks a straightforward extension to modal predication (see footnote 36). A proper discussion of the modal dimension of my proposed picture lies beyond the scope of this paper. Thanks to a referee for helpful comments on this issue.

object is the chair's underlying matter, because we get to it by stripping away the chair's form.[26]

Ordinary objects understood as double-layered are ontologically thin. They are logical constructions dependent on, or derived from, material objects and facts about material objects. Assuming that the category of material object and the category of state of affairs, to which facts belong, are fundamental ontological categories, ordinary objects belong to a derived, higher-level ontological category.[27] Furthermore, ordinary objects understood as compounds are abundant. Ordinary objects are absolutely identical just in case they have the same components—that is, the same underlying matter and the same individual form. Suppose that one material object is both a subject of a piece-of-paper-path and a subject of a distinct paper-plane-path (recall that paper-plane-paths contain artifactual properties not contained in piece-of-paper-paths). Then there are two absolutely distinct compounds, a piece of paper and a paper plane with a common underlying quantity of matter. Or suppose that two material objects are subjects of a single person-path (in virtue of the objects' person-states being sufficiently similar and causally connected). Then there are two absolutely distinct compounds, two persons with a common individual form. This way of individuating ordinary objects immediately raises an issue of fit with common sense, an issue that will be addressed shortly.

Let me emphasize that what has just been given is a metaphysical theory of ordinary objects as compounds. In what follows, this theory will be motivated by its role as a powerful basis for perspectival predication, which in turn will constitute a tool for sustaining a massive portion of the qualitative profile ordinary thinkers ascribe to ordinary objects. That is, the proposed metaphysical theory of ordinary objects as compounds will be evaluated by how well it fares in capturing our ordinary conception of the world, by whether it renders true a system of predications that we commonly hold true. This standard of evaluation is the only plausible standard. It would

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[26]To emphasize, the phrases 'underlying matter' and 'individual form' are meant to be vivid heuristic devices, not precise terms. The precise terms are 'material object' and 'K-path'.

[27]While ordered pairs of material objects and K-paths are well-understood candidates for the role of compound, other candidates may be considered. In particular, compounds may be conceived mereologically instead of set-theoretically, to the effect that an ordinary object is a whole with a material object and a K-path as parts. In this case, it is important to emphasize that the components of an ordinary object are only the K-path and the material object that the K-path has as a subject. That is, not any part of a mereologically individuated compound is a component. I prefer ordered pairs for reasons that play no role here.

be a mistake to expect a metaphysical theory of ordinary objects to match exactly what ordinary folks think these objects are. It would, accordingly, be misguided to criticize the proposed theory on the grounds that ordinary objects have components—namely, K-paths and mereologically individuated material objects—that ordinary folks do not know about. The limited access of ordinary thinkers to the true nature of chairs presents no reason for concern. Whereas a metaphysical theory can plausibly be expected to sustain an ordinary conception of the world, it cannot plausibly be expected to survive in the guise of a folk theory of the world.

2.2   Sortal sensitivity and sortal abstraction

Having addressed the metaphysics of ordinary objects, let us turn to the semantics of ordinary discourse about these objects. It is a common view that the things over which quantifiers of ordinary discourse (about objects) range and the things to which the singular terms of ordinary discourse refer are ordinary objects, the objects to which ordinary sortal terms apply. I shall adopt this view in combination with the compound view of ordinary objects developed above. Thus, the domain of quantification in ordinary discourse is restricted to the set of ordered pairs of material objects and K-paths, such that the material object is a subject of the K-path, and each singular term in ordinary discourse refers to (or purports to refer to) a member of this restricted domain. With these assumptions about quantification and singular reference in place, let us focus on predication. My central semantic thesis is that ordinary predication is perspectival: ordinary predications employ modes of predication that correspond to different perspectives on ordinary objects.

2.2.1   Perspectives and modes of predication

We typically conceive of the macroscopic objects around us in ways that are sensitive to the sort or sorts to which these objects belong. When we conceive of an object as a musical instrument, we conceive of it as belonging to some instrument sort or other. When we conceive of an object as a piano, we conceive of it as belonging to a particular sort, and as having the defining properties of objects of that sort. When we conceive of an object as a spinet, we conceive of it as a piano with certain further distinguishing features. Conceiving of an object in any of these ways constitutes a type of

perspective on the object that will be called *sortal-sensitive*.[28]

While this is the default perspective of unreflective common sense on the world of objects, I claim that it is not the only perspective of common sense. Just as we can think of objects under sortal covers, we can strip away these sortal covers and think of the same objects as mere quantities of matter. That is, we can think of an object in a way that places no emphasis on any properties that define what it is to belong to a particular sort, for any sort. Conceiving of an object in a highly general way that abstracts from sortal differences may, for example, include conceiving of it as occupying a unique region in space. Conceiving of an object in such a way constitutes a type of perspective on the object that will be called *sortal-abstract*. That ordinary thinkers shift between the sortal-sensitive and the sortal-abstract perspective on objects is a substantive thesis. This thesis requires support, and the nature of the sortal-abstract perspective requires further clarification. In Section 3.2, I shall go some way towards satisfying these desiderata.

A third perspective on the world of objects transcends both the sortal-sensitive and the sortal-abstract perspectives. This is the *absolute* perspective of the philosopher who conceives of objects as compounds of sort-realizing individual forms and underlying quantities of matter, and who explains content and connection of the other perspectives by saying that the sortal-sensitive perspective focuses on an object's individual form, whereas the sortal-abstract perspective focuses on an object's underlying matter. The absolute perspective, which brings into view the logical structure of ordinary objects, is hidden from ordinary thinkers. Ordinary thinkers shift between the sortal-sensitive and the sortal-abstract perspectives on objects but never rise to the absolute perspective.

To a type of perspective on objects corresponds a mode of predication. Such a mode is here understood as a certain way of predicating a property of an object. First, some terminology. By adopting the sortal-sensitive perspective on an ordinary object, a speaker employs the *formal* mode of predication when describing the object. By adopting the sortal-abstract

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[28]The adjective 'sortal-sensitive' is not to be confused with 'sortal-relative'. The standard view is that an attribute is sortal-relative if it applies to one or more objects under one sort to which the object or objects belong, whereas it fails to apply to the object or objects under another sort to which it or they belong. If identity is sortal-relative, to take the most prominent type of sortal relativity, then *o* may be the same person as *o**, while *o* is a different organism than *o**. See also the sortal-relativity approach to the paradoxes of coincidence discussed briefly in Section 1.2. No form of sortal relativity will be defended here.

perspective on an ordinary object, a speaker employs the *material* mode of predication when describing the object. By adopting the absolute perspective on an ordinary object, a speaker employs the *absolute* mode of predication when describing the object.[29]

Consider, for example, a chair, *o*. If I conceive of *o* as a chair and say that *o* is comfortable, then my utterance is a formal predication. If I conceive of *o* as a quantity of matter and say that *o* occupies a unique region in space, then my utterance is a material predication. If I conceive of *o* as a compound and say that *o* is a logical construction, then my utterance is an absolute predication. In accordance with what has been said about the accessibility of the various perspectives, predications about objects in ordinary discourse may employ the formal or the material mode, the formal mode being the default. The absolute mode, however, is not represented in ordinary discourse about objects; it is confined to the technical language of the seminar room.[30] The thesis that ordinary discourse may employ both the formal and the material mode of predication will be called *perspectivalism*.[31]

Let me give a brief outline of the syntax and semantics of these modes of predication. Consider a monadic predication '*o* is F' about an ordinary object *o*. (The extension to polyadic and temporal predications will be straightforward.) This predication may be read in three different ways, as an absolute predication, as a formal predication and as a material predication. In order to represent modes of predication in a formal language, an indicator of the mode of predication must attach to the indicator of predication. The familiar parentheses will be used as indicator of predication. The subscripted

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[29]The different perspectives convey a sense of the circumstances in which the formal, the material and the absolute mode of predication are in play. While these modes of predication will be made precise below, the intuitive notion of a perspective will remain unanalyzed.

[30]Let me emphasize that this thesis is restricted to discourse about ordinary objects, and thereby leaves open whether the absolute mode of predication is represented in ordinary discourse about other categories of things.

[31]Two issues should be mentioned. First, material predications, uttered from the sortal-abstract perspective, typically describe ordinary objects in a highly general way that is meant to apply to all objects (more on paradigmatic cases in Section 3.2). Could statements that describe an object in a fairly specific way employ the material mode of predication? For example, could a statement such as '*o* is comfortable' be read as a material predication? Second, predications with a proper name or a variable in subject position can plausibly employ the material as well as the formal mode of predication. Could statements with a noun phrase in subject position that is governed by a sortal term employ the material mode of predication? For example, could a statement such as 'That chair is extended in space' be read as a material predication? I hope to address these and related questions of detail on another occasion.

tag of 'form' to the right-parenthesis will indicate the formal mode of predication; and the subscripted tag of 'mat' to the right-parenthesis will indicate the material mode of predication. The unsubscripted right-parenthesis will indicate the absolute mode of predication. Thus, if 'o is F' is read as an absolute predication, then it has the familiar logical form '$F(o)$'. If 'o is F' is read as a formal predication, then it has the logical form '$F(o)_{form}$'. If 'o is F' is read as a material predication, then it has the logical form '$F(o)_{mat}$'. Henceforth, I shall specify these readings semi-formally, as 'o is absolutely F', 'o is formally F' and 'o is materially F', respectively.[32]

The rough semantic picture of how these modes of predication work is the following. First of all, the semantics of absolute predication, whether temporal or atemporal, will be taken as understood, and no truth conditions will be specified. As regards formal and material predication, it will be assumed that an ordinary object is a compound; it has an individual form and an underlying quantity of matter as components. When we ask what the object is like *formally*, we ask which properties are contained in the object's individual form, emphasizing the sort(s) to which the object belongs (for the link between sorts and individual forms, see Section 2.1). When we ask what the object is like *materially*, we ask which properties are instantiated by the object's underlying matter, abstracting from the object's sort(s). In short, formal, sortal-sensitive predication concerns form, whereas material, sortal-abstract predication concerns matter.

Perspectivalism also applies to ordinary statements of identity. Consider a chair o and a chair o^*. Adopting the sortal-sensitive perspective, we can ask whether o is formally identical with o^*; and adopting the sortal-abstract perspective, we can ask whether o is materially identical with o^*. Both of these questions are weaker than the philosopher's question whether o and o^* are absolutely identical. When we ask whether o and o^* are formally identical, we ask whether they have the same individual form. When we ask whether o and o^* are materially identical, we ask whether they have the same underlying matter. And when the philosopher asks whether o and o^* are absolutely identical, she asks whether they have the same individual

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[32]In an ordinary predication with a copula 'is' the best way to indicate the formal and the material mode of predication is to subscript a marker 'form' or 'mat' to the copula, the mark of predication, as in 'o is$_{form}$ F' or 'o is$_{mat}$ F'. Since we will regularly encounter formal and material predications without a copula, such as 'o exists at t', I shall not follow the subscription strategy, and rather indicate the formal and the material mode of predication, in informal contexts, by means of the adverbs 'formally' and 'materially', as in 'o exists formally at t' and 'o exists materially at t'. It must be emphasized, however, that 'formally' and 'materially' are not to be understood as predicate modifiers. I am grateful to a referee for help with the syntactic dimension of the proposed picture.

form *and* the same underlying matter. Given the close relationship between the concept of identity and the concept of number, if statements of identity can be read in these different ways, then so can statements of cardinality, statements about the number of things.

It is important for what follows that the properties contained in a chair's individual form typically differ to some extent from the properties instantiated by the chair's underlying matter. A chair's individual form will, for example, typically include a change in parts over time. A chair's underlying quantity of matter, however, cannot change in parts. Accordingly, the spatio-temporal trajectory traced by the component chair-path diverges from the spatio-temporal trajectory possessed by the component material object. In short, perspectival predication typically involves perspectival variation. Likewise for identity statements. Absolutely distinct chairs may have the same chair-path and distinct material objects as components. Then they are formally identical but materially distinct. A piece of paper and a paper plane may have the same material object but distinct K-paths as components, a paper-plane-path and a piece-of-paper-path. Then they are formally distinct but materially identical. Perspectival variation will be central to dissolving the paradoxes of coincidence. But first I shall work out the semantics of formal and material predication in greater detail.

2.2.2 Formal predication

Formal predication concerns an object's individual form, its component K-path. Consider the statement 'P is formally happy at t', where P is some person.[33] P has a component person-path and a component material object. A person-path is a particular distribution of person-relevant facts across space and time. Such a distribution includes the causally connected possession of different beliefs, desires, emotions, and so on, by the same or different material objects at different times. For P to be formally happy at t is for P's component person-path to contain happiness at t. Notice that in order for P's person-path to contain happiness at t, it is not necessary that P's component material object itself instantiate happiness at t—if P = $\langle a, i \rangle$, then for P to be formally happy at t, it is not necessary that a be happy at t. For a person-path to contain a property is for some subject of the person-path, not any particular subject, to instantiate the property. K-paths typically have many subjects; property-containment is a division of

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[33]Remember that 'formally' is not a predicate modifier, but rather a copula modifier, indicating the formal mode of predication.

labor among them.[34]

The truth conditions of temporal predications in the formal mode may be stated as follows: for any ordinary object o,

(T1) o exists formally at t iff there is a kind K and a K-path i, such that o has i as a component, and for some material object a, i includes the fact that a exists at t.[35]

(T2) o is formally F at t iff there is a kind K and a K-path i, such that o has i as a component, and for some material object a, i includes the fact that a is F at t.[36]

We expect a person to be formally happy at a time only if it exists formally at that time. In the present framework, if o is formally F at t, then o's component K-path includes a K-state of some material object a that obtains at t. A K-state of a material object a that obtains at t is required to include the fact that a exists at t. If o's component K-path includes a

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[34]For simplicity, I am here assuming that 'P' determinately refers to a certain compound. Below I shall open the door for referential indeterminacy of ordinary proper names.

[35]Designators of the form 'the fact that a exists at t' and 'the fact that a is F at t' are to be read as 'the fact that a exists absolutely at t' and 'the fact that a is absolutely F at t'.

[36]Two extensions and a limitation. First, sortal predicates. Assuming that $\ulcorner F_i^K \urcorner$ stands for a complex K-realizing property, the temporal application conditions of a sortal K are usually construed roughly along the following lines: o is a K iff for all times t at which o exists, there is some predicate $\ulcorner F_i^K \urcorner$, such that o is F_i^K at t. This condition schema is to be read as employing the formal mode of predication: o is a K iff for all times t at which o exists formally, there is some predicate $\ulcorner F_i^K \urcorner$, such that o is formally F_i^K at t. Given the nature of material objects and the semantics of material predication to be specified below, if the application conditions of K-hood were read as material conditions, then there would probably be no Ks.

Second, negative predicates. The truth conditions of attributions of non-existence are the following: o does formally not exist at t iff o has a K-path i as a component, and for any material object a, i does not include the fact that a exists at t. Analogously for the truth conditions of negative predications of the form 'o is formally not-F at t'.

Third, modal predicates. The present account of temporal predication lacks a straightforward extension to modal predication. Person o is actually happy at t but could be sad at t instead. More perspicuously, there is a possible world w, such that o is formally happy at t in the actual world but o is formally sad at t in w. Since K-paths are conjunctions of facts, o's person-path does not include any states of affairs that do not actually obtain. Hence, o's being formally sad at t in w cannot be a matter of o's person-path including a state of affairs of a's being sad at t, for some material object a, which obtains in w but not in the actual world. I shall address the question of how modal predications of this type are to be treated within the present framework elsewhere.

K-state that includes the fact that a exists at t, then o exists formally at t. Hence, if o is formally F at t, then o exists formally at t.

How should (T2) be extended to formal predications of relations? Consider first the predication 'P is formally taller than P^* at t', where P and P^* are persons. This is a predication of an internal relation, a relation of similarity or difference in intrinsic respects. Internal relations are grounded in the intrinsic profiles of its relata, in the present case the heights of persons.[37] For P to be formally taller than P^* at t is for P's component person-path to include the fact that a has height H at t, for some material object a, and for P^*'s component person-path to include the fact that b has height H* at t, for some material object b, such that the pair of a's having H at t and b's having H* at t grounds the fact that a is taller than b at t. The relation of grounding obtains in this case when the value of H is greater than the value of H*.[38] The point can be put by saying that while P's and P^*'s person-path both *explicitly* contain a certain height, the pair of P's and P^*'s person-paths *implicitly* contain the taller-than relation. In general, where R is an internal relation, for any ordinary objects o and o^*,

(T3) o is formally R to o^* at t iff there is a kind K, a kind K*, a K-path i and a K*-path i^*, and there are properties ϕ and ϕ^*, such that o has i as a component, and for some material object a, i includes the fact that a has ϕ at t, and o^* has i^* as a component, and for some material object b, i^* includes the fact that b has ϕ^* at t, and the pair of a's having ϕ at t and b's having ϕ^* at t grounds the fact that a is R to b at t.[39]

How about external relations, relations that are not grounded in the intrinsic profiles of its relata? The clearest cases of external relations are spatio-temporal relations. Consider the sentence 'B is formally north of B^* at t', where B and B^* are buildings. It is common to view spatio-temporal predications that superficially ascribe a spatial or temporal relation to objects as really ascribing such a relation to places or times occupied by these objects. The mentioned example may then be read as 'B formally

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[37] See Lewis 1986, 62.

[38] The relation of grounding is intuitively well-understood. I shall refrain from suggesting an explication.

[39] Formal predications of parthood, such as 'The engine is a part of the car at t', are a special case of implicit containment: o is formally a part of o^* at t iff there is a kind K, a kind K*, a K-path i and a K*-path i^*, such that o^* has i^* as a component, and for some material objects a and b, i^* includes the fact that a has b as a part at t, and o has i as a component, such that i includes the fact that b exists at t.

occupies a place p at t, B^* formally occupies a place p^* at t, and p is north of p^* at t.' Here the ascription of the north-of relation is not sortal-sensitive, only the ascription of occupation is. And 'B formally occupies place p at t' is covered by truth conditions (T2) of monadic formal predications, if 'occupies p' is read as a complex monadic predicate.[40]

Finally, consider the relation of coincidence, which is of central interest to the present inquiry. This relation may be ascribed in a formal and in a material way. Accordingly, the standard definition of coincidence (stated in Section 1) has different readings. Here is its formal reading: for any ordinary objects o and o^*,

(FC) o formally coincides with o^* at $t =_{df}$ there is a place p and a plurality of microphysical particles, the xs, such that o formally occupies p at t and is formally composed of the xs at t, and o^* formally occupies p at t and is formally composed of the xs at t.[41]

Formal predications of the form 'o formally occupies p at t' and 'o is formally composed of the xs at t', as they occur on the right-hand side of (FC), are

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[40]The property of occupying a certain place is here viewed as an intrinsic property of a material object. This type of relational property is thus a candidate for being explicitly contained in a K-path.

[41]In the present framework, to say that o formally coincides with o^* at t is to predicate the relation of coincidence to o and o^* in the formal way. As a reminder of the background of this claim, consider the questions with which we started (see Section 1): How many objects fit into a given place at a time? And how many objects can be composed of a given collection of particles at a time? The perspectivalist wants to make sense of different perspectives on these questions, and hence on the spatial and mereological profile of ordinary objects. To say, from the sortal-sensitive perspective, that o and o^* occupy the same place at t is to say that o and o^* formally occupy the same place at t. Similarly, to say, from the sortal-sensitive perspective, that o and o^* are composed of the same microphysical particles at t is to say that o and o^* are formally composed of the same particles at t. These are predications in the formal mode. By following standard practice and introducing 'coincidence' as a label for a complex spatio-mereological relation, the perspectivalist is thus committed to treating claims of coincidence made from the sortal-sensitive perspective as employing the formal mode of predication. (Those who think of coincidence only spatially or only mereologically may simplify (FC) accordingly.)

Let me add that there is room in the framework of perspectivalism for recognizing a distinctive relation of formal coincidence that is predicated absolutely: o and o^* stand (absolutely) in the relation of formal coincidence at t iff there is a kind K, a kind K*, a K-state s and a K*-state s^*, such that o has s at t, o^* has s^* at t, and $s = s^*$. To mark a difference from (FC), ordinary objects may stand in this relation, although these objects are formally non-spatial, in the sense that they do not formally occupy any spatial region at any time. I shall leave discussion of the use of this device to another occasion. Thanks to a referee for helpful suggestions regarding formal coincidence.

covered by truth conditions (T2) of monadic formal predications, if 'occupies p' and 'is composed of the xs' are read as complex monadic predicates.[42]

Let us move on to formal predications of identity. This chair and that chair are formally identical just in case they have the same component chair-path, the same individual form. In general, for any ordinary objects o and o^*,

(T4) o is formally identical with o^* iff there is a kind K, a kind K*, a K-path i and a K*-path i^*, such that o has i as a component, o^* has i^* as a component, and i is identical with i^*.[43]

Given the intimate relationship between the concept of identity and the concept of number, cardinality statements have a formal reading if identity statements do. Formally counting Ks is, roughly, determining formal distinctness of Ks. Determining formal distinctness of Ks amounts to determining absolute distinctness of K-paths. Thus, formally counting Ks is counting K-paths.

Ordinary statements of identity do not ascribe identity absolutely; they only do so formally or materially (more on the material mode shortly). This is an instance of my general thesis, expressed earlier, that the absolute mode of predication is not represented in ordinary discourse about objects. The question whether o is formally identical with o^* is weaker than the question whether o and o^* are absolutely identical. Ordinary objects o and o^* may have distinct material objects, distinct quantities of matter, but the same chair-path, the same individual form, as components. This makes o and o^* absolutely distinct but formally identical. In other words, formal identity is not identity; it is the weaker equivalence relation of having the same K-path as a component.[44]

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[42]How about the relation of marriage? It is not an internal relation between two people. Nor is it a relation between places or times. A rough but natural suggestion is that it really is an internal relation between two people and a social institution, in which case it could be treated by straightforward extension of (T3). A more detailed discussion of relations like these lies beyond the scope of this paper.

[43]As regards the truth conditions of attributions of formal, sortal-sensitive distinctness to o and o^*, notice that such attributions are true only if o is a K and o^* is a K*, for some K and K*. Thus, o is formally distinct from o^* iff there is a kind K, a kind K*, a K-path i and a K*-path i^*, such that o has i as a component, and o^* has i^* as a component, and i is distinct from i^*. Formal attributions of distinctness are different from formal attributions of non-identity.

[44]Strictly speaking, there is no such thing as the relation of formal identity. There is only the formal mode of predicating the relation of identity. There is, however, a relation R—the relation of having the same individual form—such that o and o^*'s standing in R

Consider the following objection to the claim that absolute identity of objects is not represented in ordinary language. When we assert in an everyday context that o and o^* are (numerically) identical, then we expect o and o^* to be indiscernible, to have all their properties in common. If all we mean, however, is that o and o^* are formally identical, then we do not have reason to expect them to be indiscernible, since o may have a property, such as having a certain material object as a component, that o^* lacks. Thus, we do not mean formal identity, but rather a relation that preserves indiscernibility, namely absolute identity. The natural response to this objection is to point out that our ordinary expectations of indiscernibility are restricted in accordance with the thesis that the absolute perspective on the world of objects is off-limits to ordinary speakers. When we assert that o and o^* are formally identical, we do not expect o and o^* to be *absolutely* indiscernible. Our assertion of formal identity indicates that we view o and o^* from the sortal-sensitive perspective, and accordingly we expect o and o^* to be *formally* indiscernible. The principle of the formal indiscernibility of formally identical objects may be stated as follows: for any ordinary objects o and o^*,

(FI) If o is formally identical with o^*, then for all properties ϕ and times t, o has ϕ formally at t iff o^* has ϕ formally at t.

Given that absolutely identical K-paths are absolutely indiscernible, and given truth conditions (T1)-(T4), this principle is satisfied.

Notice, finally, that the present picture of ordinary identity statements raises an issue about proper names. Consider three absolutely distinct material objects a_1, a_2 and a_3. Let a_1 be absolutely F at t_1, let a_2 be absolutely F at t_2 but not at t_1, and let a_3 be absolutely F at t_3 but not at t_1, for some property F-ness. Furthermore, let chair-path i include the facts that a_1 is F at t_1, that a_2 is F at t_2 and that a_3 is F at t_3. Then there are three compounds, three chairs: $o_1 = \langle a_1,\, i \rangle$, $o_2 = \langle a_2,\, i \rangle$ and $o_3 = \langle a_3,\, i \rangle$. By the semantics of formal predication, o_1, o_2 and o_3 are formally identical and formally F at t_1, because each has i as a component, and i includes the fact that a_1 is F at t_1. Notice that this is the case, even though a_2 and a_3 are not F at t_1. Suppose further that i is the only chair-path that contains F-ness at t_1. Now consider the definite description 'the chair that is formally F at t_1'. For an object to satisfy this definite description is for it to satisfy the formula 'x and only x is formally F at t_1, and x is a chair'.

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makes it true that o is formally identical with o^*. I speak loosely when I refer to R as the relation of formal identity.

Since this formula employs the formal mode of predication, the 'only' is to be unpacked in terms of formal identity: 'x is formally F at t_1 and x is a chair, and for all y, if y is formally F at t_1 and y is a chair, then y is formally identical with x'. Since o_1, o_2 and o_3 are formally identical chairs, and since i, their common individual form, is the only chair-path that contains F-ness at t_1, each of o_1, o_2 and o_3 satisfies the description 'the chair that is formally F at t_1'. Suppose, finally, that the proper name 'C' is introduced by this definite description. Given that three compounds satisfy the description, to which of these compounds does the proper name 'C' refer? I shall not address this issue in any detail but mention a natural view to take in response. According to Hartry Field, the word 'mass' as used in pre-relativistic physics was referentially indeterminate, in the sense that it partially denoted proper mass and partially denoted relativistic mass. The theory of relativity then allowed physicists to distinguish between the two types of magnitude.[45] Analogously, the proper name 'C' as used by ordinary speakers is referentially indeterminate, in the sense that it partially denotes multiple ordinary objects, namely o_1, o_2 and o_3. The absolute perspective allows philosophers do distinguish these ordinary objects.[46]

2.2.3 Material predication

Material predication concerns an object's underlying matter, its component material object. Suppose that I adopt the sortal-abstract perspective on the world of objects and assert that o materially occupies a unique spatial region at a time. Ordinary object o has a component K-path and a component material object. For o materially to occupy a unique spatial region at a time is for o's component material object absolutely to occupy a unique spatial region at a time. The truth conditions of temporal predications in the material mode may be stated as follows: for any ordinary objects o and o^*,

(T5) o exists materially at t iff there is a material object a, such that o has a as a component, and a exists at t.[47]

(T6) o is materially F at t iff there is a material object a, such that o has a as a component, and a is F at t.

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[45]See Field 1973.

[46]Henceforth, I shall ignore this type of referential indeterminacy. Thanks to a referee for helpful suggestions regarding the treatment of proper names in the present framework.

[47]In this and the following principles, all predications with material objects as subjects are to be understood as absolute predications.

(T7) o is materially R to o^* at t iff there is a material object a and a material object b, such that o has a as a component, o^* has b as a component, and a is R to b at t.

(T8) o is materially identical with o^* iff there is a material object a and a material object b, such that o has a as a component, o^* has b as a component, and a is identical with b.

As statements of coincidence are of central interest to the present inquiry, it must be emphasized that the standard definition of coincidence has a material as well as a formal reading (for the formal reading, see (FC) above). Here is its material reading: for any ordinary objects o and o^*,

(MC) o materially coincides with o^* at $t =_{df}$ there is a place p and a plurality of microphysical particles, the xs, such that o materially occupies p at t and is materially composed of the xs at t, and o^* materially occupies p at t and is materially composed of the xs at t.[48]

Predications of the form 'o materially occupies p at t' and 'o is materially composed of the xs at t', as they occur on the right-hand side of (MC), are covered by truth conditions (T6) of monadic material predications, if 'occupies p' and 'is composed of the xs' are read as complex monadic predicates.

Furthermore, it should be pointed out that the the principle of the formal indiscernibility of formally identical objects, (FI), has a material analogue: for any ordinary objects o and o^*,

(MI) If o is materially identical with o^*, then for all properties ϕ and all times t, o has ϕ materially at t iff o^* has ϕ materially at t.

Given that absolutely identical material objects are absolutely indiscernible, and given truth conditions (T5)-(T8), this principle is satisfied.

Take the example of persistence statements and compare the truth conditions of material predications to the truth conditions of formal predications

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[48]In the present framework, to say that o materially coincides with o^* at t is to predicate the spatio-mereological relation of coincidence to o and o^* in the material way. The background of this claim is analogous to the one sketched in footnote 41 for coincidence in the formal mode. I should add that there is room in the framework of perspectivalism for recognizing a distinctive relation of material coincidence that is predicated absolutely: o and o^* stand (absolutely) in the relation of material coincidence at t iff there is a kind K, a kind K*, a K-state s and a K*-state s^*, such that o has s at t, o^* has s^* at t, and s has the same material object as subject as s^*. As in the case of the relation of formal coincidence mentioned in footnote 41, I will not discuss applications of this new relation of material coincidence here.

given earlier. While P's formal persistence through time depends on the temporal trajectory included in P's component person-path—by virtue of this path's including, for example, the facts that a exists at t and that b exists at t^*, for some material objects a and b—P's material persistence depends on the temporal trajectory of P's component material object. While our typical, sortal-sensitive talk tracks ordinary objects under sortal covers, sortal-abstract talk strips away all those covers. Since ordinary objects are double-layered, composed of individual form and underlying matter, shifting between sortal-sensitive and sortal-abstract talk—between formal and material predication—is shifting between different aspects of the same subject.

2.2.4   Modesty and variability

Perspectivalism has two features of particular importance. First, perspectivalism is metaphysically modest, because the formal and the material mode of predication do not correspond to multiple modes of instantiating a property or relation. A mode of predication at the syntactic level corresponds to an operation on properties or relations in reality. Let us assume that a predicate F stands for a property ϕ of a sort suited to being instantiated by material objects. For a material object a designated by $\mathbf{a}$, if $\ulcorner F(\mathbf{a})\urcorner$ is true, then it is true because a instantiates ϕ. For an ordinary object $o = \langle a,\, i \rangle$, designated by $\mathbf{o}$, if $\ulcorner F(\mathbf{o})_{form}\urcorner$ is true, then it is true because o instantiates a property ϕ^* determined by ϕ along the lines of (T2), namely the property of having a component K-path that includes the fact that b instantiates ϕ, for some material object b. Similarly, for an ordinary object o designated by $\mathbf{o}$, if $\ulcorner F(\mathbf{o})_{mat}\urcorner$ is true, then it is true because o instantiates a property ϕ' determined by ϕ along the lines of (T6), namely the property of having a component material object that instantiates ϕ. Assuming further that the predicate I stands for the relation of identity, we can say the following for ordinary objects o and o^*, designated by $\mathbf{o}$ and $\mathbf{o^*}$: if $\ulcorner I(\mathbf{o},\, \mathbf{o^*})_{form}\urcorner$ is true, then it is true because o bears a relation R to o^* determined by the relation of identity along the lines of (T4), namely the relation of having the same component K-path; and if $\ulcorner I(\mathbf{o},\, \mathbf{o^*})_{mat}\urcorner$ is true, then it is true because o bears a relation R* to o^* determined by the relation of identity along the lines of (T8), namely the relation of having the same component material object.[49]

Secondly, incompatible properties may be ascribed consistently to the same ordinary object from different perspectives—in short, perspectival

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[49]Thanks to a referee for help with clarifying this feature of the framework.

predication permits perspectival variation. The component chair-path of an ordinary object o may include a change in parts, whereas o's component material object has the same parts at all times of its existence. Then o changes formally but not materially in parts over time. The component person-path of an ordinary object o may contain happiness at t, while o's component material object is not happy at t. Then o is formally but not materially happy at t. Somewhat more rigorously, suppose that material object a exists at t_1 but not at t_2, that material object b does exist at t_2, and that a K-path i includes the facts that a exists at t_1 and that b exists at t_2. Consequently, there is an ordinary object o, the pair $\langle a, i \rangle$, such that, by truth conditions (T1), o exists formally at t_2, and by truth conditions (T5), o does not exist materially at t_2. In short, the formal trajectory of o diverges from the material trajectory of o. It is essential to these cases of perspectival variation that property-containment is a division of labor among distinct material objects; for a K-path to contain a property is for some subject of the K-path, not any particular subject, to instantiate the property.

Perspectival variation also extends to predications of identity. By truth conditions (T4), being formally identical is having the same component K-path. By truth conditions (T8), being materially identical is having the same component material object. Chair o has a certain chair-path and a certain material object as components. Chair o^* has the same chair-path but a distinct material object as components. Then o is formally identical with o^* but materially distinct. Piece of paper o and paper plane o^* contain the same material object but distinct K-paths, a paper-plane-path and a piece-of-paper-path. Then o is formally distinct from o^* but materially identical.

Perspectival variation is the key to dissolving the paradoxes of coincidence. The basic idea is that we "see" different things from different perspectives. From the sortal-sensitive perspective the ordinary world is a place crowded with distinct coincidents, whereas from the sortal-abstract perspective no distinct coincidents are to be found anywhere.[50]

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[50]The present framework's powers of handling paradoxical features of ordinary objects reach well beyond cases of distinct coincidents. I restrict my focus in order to present an application in appropriate detail.

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3 Dissolution

The apparent conflict between our cases of coinciding ordinary objects (A)-(E) and the anti-coincidence principle (AC)—the common-sense principle that distinct ordinary objects cannot coincide—will be dissolved in two steps. First, I will reconstruct cases (A)-(E) as well as the anti-coincidence principle (AC) within the framework of perspectivalism. Then I will show that the cases and the principle thus construed are compatible.

3.1 Formal coincidence

The crux of cases (A)-(E) may be compressed into the following claims:

(A) A piece of paper P exists at t_1 and t_2, and a paper airplane P^* exists at t_2 but not at t_1. Hence, P is distinct from P^*. Moreover, P coincides with P^* at t_2.

(B) A cat Tibbles exists at t_1. A lump of tissue Tib also exists at t_1. Since tail T is a part of Tibbles at t_1 but not a part of Tib at t_1, Tibbles is distinct from Tib. Since Tibbles still exists at t_2 after T is destroyed, and Tib still exists at t_2 as well, Tibbles and Tib coincide at t_2.

(C) A letter L exists at t_1 and t_2, and a letter L^* exists at t_2 but not at t_1. Hence, L is distinct from L^*. Moreover, L coincides with L^* at t_2.

(D) A person P exists at t_1 and at t_2 but not at t_3, and a person P^* exists at t_2 and at t_3 but not at t_1. Hence, P is distinct from P^*. Moreover, P coincides with P^* at t_2.

(E) Chair C is defective at t, but piece of wood W is not. Hence, C is distinct from W. Moreover, C coincides with W at t.

Descriptions (A)-(E) are plausibly construed as manifesting the sortal-sensitive perspective on the world. In cases (A)-(D), distinctness of coinciding objects is established on the basis of diachronic differences specific to pieces of paper, paper planes, cats, lumps of tissue, letters and persons. In case (E), distinctness of coinciding objects is established on the basis of synchronic differences specific to chairs and pieces of wood. Assuming that the sortal-sensitive perspective on objects has a corresponding mode of predication, the formal mode (as characterized in Section 2.2), (A)-(E) may be given the following perspicuous readings:

(A*) A piece of paper P exists formally at t_1 and t_2, and a paper airplane P^* exists formally at t_2 but not at t_1. Hence, P is formally distinct from P^*.[51] Moreover, P coincides formally with P^* at t_2.

(B*) A cat Tibbles exists formally at t_1. A lump of tissue Tib also exists formally at t_1. Since tail T is formally a part of Tibbles at t_1 but not a part of Tib at t_1, Tibbles is formally distinct from Tib. Since Tibbles still exists formally at t_2 after T is formally destroyed, and Tib still exists formally at t_2 as well, Tibbles and Tib coincide formally at t_2.

(C*) A letter L exists formally at t_1 and t_2, and a letter L^* exists formally at t_2 but not at t_1. Hence, L is formally distinct from L^*. Moreover, L coincides formally with L^* at t_2.

(D*) A person P exists formally at t_1 and at t_2 but not at t_3, and a person P^* exists formally at t_2 and at t_3 but not at t_1. Hence, P is formally distinct from P^*. Moreover, P coincides formally with P^* at t_2.

(E*) Chair C is formally defective at t, but piece of wood W is not. Hence, C is formally distinct from W. Moreover, C coincides formally with W at t.

3.2 Material anti-coincidence

The anti-coincidence principle (AC) says that no distinct ordinary objects can coincide at any time (under the actual laws of nature). Why do we find this principle so compelling? I doubt that we are committed to this principle because it is encoded in our sortal concepts. That is, I doubt that we reach the principle on the grounds that distinct persons cannot coincide, that distinct artifacts cannot coincide, and so on. I doubt this because the impression that distinct ordinary objects cannot coincide seems entirely independent of the specific properties that make objects persons, letters or paper planes. The principle does not seem to derive from the specific psychological, physical and social ways in which we think about persons, letters, paper planes and other kinds of object. The question 'How many things fit into a spatial region?' seems to have a fundamentally different status than the question 'How many things fit into a refrigerator?'. The second question seems sensitive to the sorts by which we typically classify objects, whereas

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[51] This inference employs principle (FI) from Section 2: If o is formally identical with o^*, then for all properties ϕ and all times t, o has ϕ formally at t iff o^* has ϕ formally at t. Likewise for the inferences to distinctness in (B*)-(E*).

the sort of a thing seems entirely irrelevant to the first question. In short, the principle does not seem to manifest the sortal-sensitive perspective on the world.

My hypothesis is the following. We find the anti-coincidence principle so compelling—we recognize it as a platitude of common sense—because it partly constitutes our conception of macroscopic objects in abstraction from the sorts to which these objects belong. This conception manifests the sortal-abstract perspective on the world, from which perspective ordinary macroscopic objects are attributed a common, minimal spatio-temporal and mereological profile. Abstraction starts with sortally individuated ordinary objects and then strips them from their sortal profile. Abstraction involves a transition from the sphere of enmattered forms to the sphere of mere quantities of matter. I suggest that ordinary thinkers have a frame-conception of the world that does transcend the sortal sphere in this way. The principle that distinct ordinary objects cannot coincide at any time is one pillar of our sortal-abstract conception of the world. It is not the only pillar. The principle is naturally complemented by others, for example the principle that an ordinary object cannot exactly occupy distinct spatial regions at the same time (under the actual laws of nature). The latter principle, like the anti-coincidence principle, seems independent of any sort-determining features of ordinary objects.

Given that the sortal-abstract perspective on objects has a corresponding mode of predication, the material mode (as characterized in Section 2.2), the status of (AC) as a principle that abstracts from sortal profiles may be captured by the following reading:

(AC*) Necessarily, for any ordinary objects o and o^*, and for any time t, if o coincides materially with o^* at t, then o is materially identical with o^*.

Notice that on my construal of the anti-coincidence principle as sortal-abstract, coincidence of distinct objects of different sorts and coincidence of distinct objects of the same sort have the same status. The puzzlement induced by both types of coincidence arises from the same extra-sortal principle, (AC*).

3.3 Compatibility

While the construal of (A)-(E) as the sortal-sensitive (A*)-(E*) and the construal of (AC) as the sortal-abstract (AC*) are taken to possess intrinsic plausibility, the main motivation of these construals lies in their role

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in dissolving the paradoxes of coincidence. For if (A)-(E) are understood as (A*)-(E*), and (AC) is understood as (AC*), then paradox disappears, since (A*)-(E*) are compatible with (AC*). This may be shown by specifying the metaphysical basis of each of (A*)-(E*) in a way that preserves (AC*). The metaphysical basis of (A*)-(E*) will be specified in terms of mereologically individuated material objects, K-paths, and ordinary objects construed as compounds of material objects and K-paths. Notice that if the metaphysical basis of (A*)-(E*) is specified in consistency with extensionality principle (M) about material objects, then compatibility with (AC*) is established, since (AC*) follows logically from (M), assuming the truth conditions of material predication, (T5)-(T8), and the definition of material coincidence (MC). Moreover, all ascriptions of properties in the upcoming metaphysical specifications will be understood as absolute ascriptions. For ease of exposition, I shall refer to truth conditions (T1)-(T4) together with the definition of formal coincidence, (FC), as the semantics of formal predication, and to truth conditions (T5)-(T8) together with the definition of material coincidence, (MC), as the semantics of material predication.

First, a material object a exists at times t_1 and t_2, and a is piece-of-paper-shaped at t_1 and t_2, whereas a is paper-plane-shaped at t_2 but not at t_1. (Henceforth, I shall use 'K-shaped' to indicate the possession of K-relevant properties, whatever these properties may be.) Further, piece-of-paper-path i includes the fact that a exists at t_1, that a exists at t_2, that a exactly occupies place p at t_2, and that a is composed of the xs, a plurality of microphysical particles, at t_2. Paper-plane-path i^*, on the other hand, includes the fact that a exists at t_2, that a exactly occupies place p at t_2, and that a is composed of the xs at t_2, but does not contain existence at t_1. Thus, i and i^* are distinct but include the instantiation of the same spatial and mereological properties at t_2. Finally, piece of paper P is the pair $\langle a, i \rangle$, whereas paper plane P^* is the pair $\langle a, i^* \rangle$. By the semantics of formal predication, these specifications make (A*) true. (Note that what we get here is a simple version of case (A) in which no mereological variation occurs in the transition from piece of paper to paper plane.) By the semantics of material predication, these specifications are consistent with (AC*), since P is materially identical with P^*.

Second, a material object a_1 is cat-shaped and exists at t_1. Since a tail-shaped part of a_1 is destroyed after t_1, and since a_1 is mereologically individuated (see principle (M)), a_1 does not exist at t_2. Further, material object a_2 is a proper part of a_1 in the shape of a cat without a tail, that exists at t_1 and at t_2. Cat-path i includes the fact that a_1 exists at t_1 and that a_2 exists at t_2, but not that a_2 exists at t_1. Lump-of-tissue-path i^*,

on the other hand, includes the fact that a_2 exists at t_1 and that a_2 exists at t_2. Moreover, distinct paths i and i^* include the instantiation of the same spatial and mereological properties at t_2 (a condition spelled out in detail for case (A*) above). Finally, Tibbles the cat is the pair $\langle a_1, i \rangle$ and Tib the lump of tissue is the pair $\langle a_2, i^* \rangle$.[52] By the semantics of formal predication, these specifications make (B*) true. And by the semantics of material predication, the specifications are consistent with (AC*); since Tib but not Tibbles persists materially from t_1 to t_2, Tibbles and Tib do not coincide materially at t_2.[53]

Third, a material object a_1 is letter-shaped and exists at time t_1. A material object a_2 is also letter-shaped and exists at time t_2. Objects a_1 and a_2 are distinct in virtue of minor differences in their mereological composition (still assuming that material objects are individuated by their parts). Letter-path i includes the fact that a_1 exists at t_1 and that a_2 exists at t_2, whereas letter-path i^* includes the fact that a_2 exists at t_2 but does not contain existence at t_1. Moreover, distinct paths i and i^* include the instantiation of the same spatial and mereological properties at t_2. Finally, letter L is the pair $\langle a_1, i \rangle$ and letter L^* is the pair $\langle a_2, i^* \rangle$. By the semantics of formal predication, these specifications make (C*) true. (Note that we are here construing case (C) as involving minor mereological variation in the original letter L between times t_1 and t_2.) By the semantics of material predication, the specifications are consistent with (AC*); L and L^* do not coincide materially at t_2, since their component material objects, a_1 and a_2, differ in parts.

Fourth, a person-shaped material object a_1 exists at time t_1, a person-shaped material object a_2 exists at t_2, and a person-shaped material object a_3 exists at t_3, where t_1 and t_2 as well as t_2 and t_3 are a hundred years apart.

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[52]The assignment of the pair $\langle a_1, i \rangle$ to the name 'Tibbles' is arbitrary, given that our specifications present us with another cat, namely $\langle a_2, i \rangle$, that is an equally good candidate to be the referent of 'Tibbles'. I shall set issues of reference aside (see Section 2.2 regarding proper names), and merely note that since $\langle a_1, i \rangle$ is formally identical with $\langle a_2, i \rangle$, the intuition that case (B) involves a single cat is preserved. As pointed out in Section 2.2, formal identity is weaker than absolute identity. It is plausible, however, to interpret the default mode of counting cats on the street as sortal-sensitive. Analogous considerations apply to the treatment of cases (C) and (D) below.

[53]I assumed that a_1 does not exist at t_2, after its tail-shaped part is destroyed. Suppose, instead, that the atoms composing the tail-shaped part at t_1 are scattered rather than destroyed at t_2, and hence that a_1 still exists at t_2. These specifications are still consistent with (AC*). Both Tibbles and Tib exist materially at t_2. However, Tibbles' component material object, a_1, and Tib's component material object, a_2, differ in parts at t_2, as they did at t_1. Since material coincidence of Tibbles and Tib at t_2 requires the sharing of parts by a_1 and a_2 at t_2 (see (MC)), Tibbles does not coincide materially with Tib at t_2.

Objects a_1, a_2 and a_3 are distinct in virtue of major differences in their mereological composition. Person-path i includes the fact that a_1 exists at t_1 and that a_2 exists at t_2, but does not contain existence at t_3. Person-path i^*, on the other hand, includes the fact that a_2 exists at t_2 and that a_3 exists at t_3, but does not contain existence at t_1. Moreover, distinct paths i and i^* include the instantiation of the same spatial and mereological properties at t_2. Finally, person P is pair $\langle a_1, i \rangle$ and person P^* is pair $\langle a_2, i^* \rangle$. By the semantics of formal predication, these specifications make (D*) true. (Note that we are here construing case (D) as involving major mereological variations in person P between t_1 and t_2 and in person P^* between t_2 and t_3.) By the semantics of material predication, the specifications are consistent with (AC*); P and P^* do not coincide materially at t_2, since their component material objects, a_1 and a_2, differ in parts.

Fifth, a material object a is both piece-of-wood-shaped and chair-shaped at time t, and hence a is a subject of a chair-path i and of a piece-of-wood-path i^*. Chair-path i includes the fact that a is (functionally) defective at t, whereas piece-of-wood-path i^* does not include the fact that a is defective at t. (Recall from Section 2.1 that K-paths are sensitive to the spheres of discourse of sortal nouns.) Moreover, distinct paths i and i^* include the instantiation of the same spatial and mereological properties at t. Chair C is pair $\langle a, i \rangle$ and piece of wood W is pair $\langle a, i^* \rangle$. By the semantics of formal predication, these specifications make (E*) true. By the semantics of material predication, the specifications are consistent with (AC*), since C is materially identical with W.

Having demonstrated the compatibility of cases (A*)-(E*) with principle (AC*), it should be emphasized that this compatibility rests on perspectival variation. In essence, cases (A*)-(D*) are compatible with (AC*), because an ordinary object's individual form may contain properties that the object's underlying matter fails to possess. And case (E*) is compatible with (AC*), because an ordinary object's underlying matter may possess properties that the object's individual form fails to contain.

I conclude that the compound view of ordinary objects in combination with perspectivalism about predication offers a unified, compatibilist solution to the paradoxes of coincidence. Our pluralist intuitions supporting the cases of distinct coincidents and our monist intuitions supporting the anti-coincidence principle manifest different perspectives on the world; our ordinary conception of the world is spliced together from sortal-sensitive and sortal-abstract beliefs. The cases of coincidence are cases of formal coincidence, manifesting the sortal-sensitive perspective on the world. In each of the cases, distinctness of coinciding objects is established on the

basis of features specific to which sort or sorts of object are involved. The anti-coincidence principle, on the other hand, is a principle of material anti-coincidence, manifesting the sortal-abstract perspective on the world. The principle abstracts from sortal input, registering only a minimal spatio-temporal and mereological profile common to all material objects. The compatibility of these perspectives protects the folk conception of ordinary objects from inconsistency. The world as we know it is safe.

4 Alternative?

The proposed perspectival dissolution of the paradoxes of coincidence is based on an account of ordinary objects as compounds of material objects and K-paths. In order to justify the choice of this metaphysical picture, I shall evaluate the prospects of sustaining a compatibilist solution to the paradoxes on the basis of a simpler account of ordinary objects, according to which an ordinary object is identical with a K-path, for some K.[54] My aim in this final section is to show that perspectivalism based on this view of ordinary objects is inferior to perspectivalism based on the compound view.

The core perspectivalist idea is this: we can take the sortal-sensitive perspective and conceive of an ordinary object under a sortal cover or we can take the sortal-abstract perspective and strip away this cover, conceiving of the same object as a mere quantity of matter. Perspectivalism offers a compatibilist way out of the paradoxes of concidence: from the sortal-sensitive perspective there are distinct coincidents, whereas from the sortal-abstract perspective there are none. In order to focus the discussion, let us restrict our attention to the case of the piece of paper and the paper plane, (A). The perspectivalist resolves the apparent conflict between (A) and the anti-coincidence principle (AC) in two steps. The first step is to interpret (A) as employing the formal mode of predication and to interpret (AC) as employing the material mode of predication:

(A*) A piece of paper P exists formally at t_1 and t_2, and a paper airplane P^* exists formally at t_2 but not at t_1. Hence, P is formally distinct from P^*. Moreover, P coincides formally with P^* at t_2.

(AC*) Necessarily, for any ordinary objects o and o^*, and for any time t, if o coincides materially with o^* at t, then o is materially identical with o^*.

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[54]This proposal stands in close proximity to the position adopted in Broad 1925 and Chisholm 1986.

The second step is to show that (A*) and (AC*) are compatible, on the basis of a semantic account of formal and material predication. If an ordinary object is a K-path, as opposed to a compound of a K-path and a material object, is such a compatibilist semantic account available?

First, formal predication. Truth conditions of temporal predications in the formal mode may be obtained by simplifying the compound view's condition (T2) in the following way: for any ordinary object o, where an ordinary object is a K-path, for some K,

(T9) o is formally F at t iff there is a material object a, such that o includes the fact that a is F at t.[55]

Analogously for formal predications of relations. Specifying truth conditions of formal predications of identity is equally straightforward. If ordinary objects are compounds, then they are formally identical just in case they have the same component K-path. If ordinary objects are just K-paths, then they are formally identical just in case they are absolutely identical: for any ordinary objects o and $o*$,

(T10) o is formally identical with $o*$ iff o is identical with $o*$.

Next, material predication. Predication in the material mode involves stripping an ordinary object down to its underlying matter by removing its sortal cover. How can this idea be developed if an ordinary object is a K-path, and hence typically has many material objects, many quantities of matter, as subjects? Let us begin with temporal predications in the material mode. Let a material object a be a subject of a K-state at time t iff the K-state includes the fact that a exists at t (or some fact to the effect that a has some property at t). And let a be a subject of a K-path at t iff a is a subject of some K-state in that K-path at t.[56] I shall assume that a K-path has at most one subject at any time. The idea of stripping away an ordinary object's sortal cover may now be relativized to a time t; and stripping away an ordinary object's sortal cover at t may be understood as passing from a K-path to its unique subject at t (if it has one). Truth conditions of temporal predications in the material mode may then be obtained by transforming the compound view's condition (T6) correspondingly: for any ordinary object o,

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[55]I shall continue to use 'o' as a variable ranging over ordinary objects. Since ordinary objects are now viewed as K-paths, the current os are the is of previous sections.

[56]This definition of the notion of being a subject of a K-path at a time is an extension of the definition of the notion of being a subject of a K-path given in Section 2.1

(T11) o is materially F at t iff there is a material object a, such that a is a subject of o at t, and a is F at t.[57]

Analogously for material predications of relations.

The remaining semantic task is to specify truth conditions of material predications of identity and distinctness. I shall continue to adopt the orthodox view that predications of identity and distinctness are temporally unrelativized.[58] Accordingly, the act of stripping away an ordinary object's sortal cover in the case of predications of identity and distinctness cannot be relativized to a particular time. How should the idea be developed, given that an ordinary object *qua* K-path typically has different material objects as subjects at different times? Let us say that ordinary objects are materially identical iff they have some common subject at some time: for any ordinary objects o and o^*,

(T12) o is materially identical with o^* iff there is a material object a, and there is a time t, such that a is a subject of o at t and a is a subject of o^* at t.

Moreover, o is materially distinct from o^* iff o and o^* have no common subject at any time.

Assuming this semantic picture of formal and material predication, the sortal-sensitive case of distinct coincidents (A*) and the sortal-abstract anti-coincidence principle (AC*) are compatible. (As in Section 2, predications of coincidence in the formal mode are to be understood along the lines of (FC) and predications of coincidence in the material mode are to be understood along the lines of (MC).) Suppose that piece of paper P is a piece-of-paper-path that includes the fact that material object a exists at t_1, that a exists at t_2, that a exactly occupies place p at t_2, and that a is composed of the xs at t_2. Suppose further that paper plane P^* is a paper-plane-path that includes the fact that a exists at t_2, that a exactly occupies place p at t_2, and that a is composed of the xs at t_2, but does

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[57]One might wonder whether the truth conditions of formal predications of the form 'o is formally F at t' specified by (T9) are equivalent to the truth conditions of material predications of the form 'o is materially F at t' specified by (T11). In order to show that this is not the case, consider (E). Piece of wood W is not formally defective, by (T9), because W does not contain the property of being defective at t. Yet W is materially defective at t, by (T11), because W's subject at t is defective at t.

[58]If this constraint is lifted, then the objections to be raised below may be avoided. This is not the place, however, for evaluating the costs of temporally relativizing ordinary predications of identity.

not contain existence at t_1. Since P and P^* are distinct but include the instantiation of the same spatial and mereological properties at t_2, it follows by the present semantics of formal predication that (A*) is true. By the present semantics of material predication, these specifications are consistent with (AC*), since P is materially identical with P^*, in virtue of P and P^* having a common material subject at t_2. With this perspectival approach to the paradoxes of coincidence the compound view faces a competitor with a simpler architecture. This competitor, however, has fatal flaws. I shall raise two objections concerning material identity.

The first objection concerns transitivity. Ordinary objects, K-paths, typically have different material subjects at different times. Suppose, as it may happen in case (D), that persons P_1 and P_2 have a common subject at time t, that persons P_2 and P_3 have a common subject at time t^*, but that P_1 and P_3 have no common subject at any time. It follows by (T12) that P_1 is materially identical with P_2, that P_2 is materially identical with P_3, but that P_1 is not materially identical with P_3. Material identity is intransitive. In order to illustrate the significance of this consequence, consider this familiar question: How many objects can exactly occupy a given spatial region at a time? According to perspectivalism, from the sortal-sensitive perspective more than one object can exactly occupy a given spatial region at a time, but from the sortal-abstract perspective at most one object can exactly occupy a given spatial region at a time. As perspectivalists we thus expect to be able to count objects by material identity as well as by formal identity. But objects can be counted by material identity only if material identity is an equivalence relation, and hence transitive.

The second objection concerns indiscernibility. Whenever we assert in an ordinary context that o and o^* are (numerically) identical, we expect o and o^* to be indiscernible. To capture this expectation in the framework of perspectivalism, according to which our ordinary identity claims either employ the formal or the material mode of predication, is to sustain both the principle of the formal indiscernibility of formally identical objects, (FI), and the principle of the material indiscernibility of materially identical objects, (MI). The latter principle (first stated in Section 2) looks as follows:

(MI) If o is materially identical with o^*, then for all properties ϕ and all times t, o has ϕ materially at t iff o^* has ϕ materially at t.

This principle fails in the present semantic framework. Consider again the case of the piece of paper and the paper plane. Suppose that piece of paper P has material object a as its subject at t_1 and at t_2, and that a is F at

t_1. Suppose further that paper plane P^* has a as its subject at t_2, but that P^* does not have a paper-plane-state at t_1, and hence does not have any subject at t_1. Since P and P^* have a common subject at t_2, P is materially identical with P^*, by (T12). Yet P is materially F at t_1, while P^* is not materially F at t_1, by (T11).

In response to these objections, one might contemplate rejecting (T12) in favor of the following truth conditions of material predications of identity: for any ordinary objects o and o^*,

(T13) o is materially identical with o^* iff for any material object a, and for any time t, a is a subject of o at t iff a is a subject of o^* at t.

If material identity amounts to having *all* subjects in common, then the transitivity of material identity and the material indiscernibility of materially identical objects are obviously preserved. The disastrous downside is that the anti-coincidence principle (AC*) ends up being false. For example, piece of paper P and paper plane P^* materially coincide at t_2, by (T11), and P and P^* are materially distinct, by (T13), since they have some but not all subjects in common. Hence, distinct coincidents are countenanced from the sortal-abstract as well as from the sortal-sensitive perspective. Compatibilism about coincidence is lost.

It remains to emphasize that the compound version of perspectivalism avoids these considerable costs. The compound view offers a perspectival dissolution of the paradoxes of coincidence on the basis of the metaphysical thesis that an ordinary object has a K-path and a unique material object as components. In this framework, in which a material predication of identity is true of objects o and o^* iff o and o^* have the same material component, material identity is transitive and materially identical objects are materially indiscernible. I conclude that a palatable unified, compatibilist solution to the paradoxes of coincidence is guaranteed only by the compound view.

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