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Inductive Metaphysics Versus Logical Construction—Russell's Methods and Realisms in 1912 and 1914

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Abstract
In his 1912 book *The Problems of Philosophy*, Bertrand Russell advocates an indirect realism with regard to physical objects. Only two years later, in his book *Our Knowledge of the External World* and the paper "The Relation of Sense-Data to Physics", he changes his method in philosophy. Instead of inferring the existence of physical objects, he now sets out to construct them out of sense-data. As I will argue in this article, the main argument from *The Problems of Philosophy* can be rationally reconstructed as an inference to the best explanation which infers to unobservable objects. The main motivation for the new approach in *Our Knowledge of the External World*, on the other hand, is to establish a more direct variant of realism, in particular because Russell became skeptical with regard to inferences to unobservable objects. As I will argue, the resulting theory of the physical world loses so much in simplicity that it becomes an unattractive alternative to his earlier position, and Russell's reason for rejecting simplicity as a criterion of theory choice turns out to be inconsequential.

Keywords Bertrand Russell · Realism · Inference to the best explanation · Inductive metaphysics · Logical construction

1 Introduction

In his 1912 book *The Problems of Philosophy*, Bertrand Russell discusses the problem of our knowledge of the external world and advocates an indirect realism with respect to physical objects. Only two years later, in his book *Our Knowledge of the External World* and the paper "The Relation of Sense-Data to Physics", he rejects this position and tries out a new path to solve the same problem. Instead of *inferring* the existence of physical objects from sense-data, he now sets out to *construct* them out of sense-data.

In this article, I will compare these two approaches with regard to the *different methods* used to solve the problem of our knowledge of the external world, as well as with regard to the *different kinds of realism* resulting from the application of the two methods. In Sect. 2, I reconstruct the main argument from *The Problems of Philosophy* as a creative abductive inference, which is an inference to the best explanation in which new concepts are introduced in the conclusion. The concept introduced in this inference is that of real external objects, which are not directly observable. Accordingly, the form of realism advocated by Russell in 1912 is an indirect, inferential realism with regard to the external world.[1] As I will argue in Sect. 3, the main motivation for introducing the new method of logical construction in 1914 is to get rid of unobservable entities and to establish *a more direct variant of realism*. But as Russell himself recognized, he had to continue to rely on inferences in the new approach, which will be examined in Sect. 4. These inferences make Russell's realism concerning physical objects at least partly an indirect realism. As I will argue in Sect. 5, the resulting theory of the external world lacks simplicity in several respects and therefore looks unattractive in comparison to his 1912 indirect realism. Russell's

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[1] Indirect realism can be distinguished into two types. On the one hand, there is a classical representative realism, according to which we have direct access to representations from which we can infer the properties of external objects, at least in principle. On the other hand, there is a realism that is more skeptical, according to which there are real external objects, but we have no access to their characteristics. Kant, for example, advocates a realism of the second kind with respect to things in themselves. Russell advocates indirect realism of the first kind in 1912. According to him, we can infer from the sense-data directly accessible to us not only the existence of external world objects, but also some of their properties. In particular, Russell believes that we can at least infer *relational* features of physical objects from our sense-data (1959 [1912], 34).

argument for the rejection of the principle of simplicity his 1912 approach relied on turns out to be problematic, because it leaves open the question how, in the light of this criticism, he can consistently adhere to other inductive principles he wishes to retain, and in particular the one he must rely on for the inferences he needs within his 1914 approach.

2 *The Problems of Philosophy*—The Inductive[2] Argument for External World Realism

In *The Problems of Philosophy*, first published in 1912, Russell begins his considerations concerning external world realism by identifying our immediate sensory experiences as that from which our knowledge of the external world, should such knowledge be possible at all, must be derived (1959 [1912], 7). But what are the *objects* of our immediate sensory experiences? On the basis of a simple consideration, Russell rejects a direct realism with regard to physical objects (ibid., 8 ff.).

The argument against this form of realism goes as follows. If we want to ascribe a certain property, for example a certain color, to a table, we realize that the table appears different to us depending on perspective and lighting conditions. Russell concludes that color is not inherent to the table as a property, but is dependent on the table, the viewer, and the lighting conditions. The same is true for all other properties that we perceive through direct experience, regardless of which of our senses is involved. This consideration leads to a distinction between appearance and reality: the way the table really is (if it exists at all) is to be distinguished from the way it appears to us through our senses. As a working hypothesis Russell posits that our sensations do not *directly* reveal the properties of the table, but rather can be seen as "*signs* of some property which perhaps *causes* all the sensations" (ibid., 11; italics in original). The properties of external objects are not experienced directly by us, they are *inferred* from what we experience (ibid.).

To have a name for the objects of our immediate experience, Russell introduces the term "sense-data" (ibid., 12). Sense-data include, for example, colors, sounds, smells, hardness and roughness. The fate of our knowledge of the external world is thus decided by the following question:

> Granted that we are certain of our own sense-data, have we any reason for regarding them as signs of the existence of something else, which we can call the physical object? (Ibid., 19 f.)

The first thing Russell notes about this is that in the face of Descartes's skeptical hypotheses, the existence of an external world *cannot be proved with certainty.* Therefore, Russell is willing to settle for a weaker form of justification. His argument for the existence of external world objects reads as follows:

> [A]lthough [the supposition that the whole life is a dream] is not logically impossible, there is no reason whatever to suppose that it is true; and it is, in fact, a less simple hypothesis, viewed as a means of accounting for the facts of our own life, than the common-sense hypothesis that there really are objects independent of us, whose action on us causes our sensations. (Ibid., 22 f.)

This argument can be divided into a negative and a positive part. The negative part consists of the statement that while the skeptical hypotheses cannot be ruled out, there is also nothing to support their truth. The positive and more interesting part consists in a consideration that, as I will argue in the following, is best analyzed, or reconstructed,[3] as an inference to the best explanation.[4]

[2] The term "inductive" is meant in a wide sense here. Inductive inferences in this sense include all kinds of non-deductive inferences, in particular enumerative-inductive inferences, analogical inferences, and inferences to the best explanation. As I will argue, Russell's main argument for realism in *The Problems of Philosophy* is based on an inference to the best explanation. I use the more inclusive term "inductive" here and also in the title of the present article, for two reasons. First, as we will see in Sect. 2, Russell himself uses the term "inductive" in this wide sense when he calls his realist argument from *The Problems of Philosophy* an inductive argument. Second, I would like thereby to give reference to the tradition of inductive metaphysics, with whose basic methodological ideas Russell's 1912 account is in surprising agreement (see n. 14 below) and which also use the term "inductive" in this broad sense.

[3] Since Russell does not use the term "inference to the best explanation" (see next footnote), and since his own metacommentaries on his inference are quite sketchy, it is difficult to prove that the inference takes exactly the form of an inference to the best explanation. To be on the safe side, therefore, I am characterizing my interpretation as a *rational reconstruction* in which I try to read, against the background of our current knowledge of inferences to the best explanation, his inference as as strong an inference as possible (in the sense of: well justified), while at the same time presenting textual evidence to support this reconstruction.

[4] Russell, of course, does not use the term "inference to the best explanation", nor is he particularly explicit about the details of the inference he makes use of. The term "inference to the best explanation" was introduced by Gilbert Harman (1965). Also common is the term "Abduction" introduced by Charles S. Peirce (cf. Schurz 2008, 202 f.). I use the expressions "inference to the best explanation" and "abductive inference" synonymously in the present paper.

In a nutshell, an inference to the best explanation starts with a set of observed phenomena that require an explanation. In a second step, various hypotheses are considered which, if they were true, would explain the observed phenomena. These hypotheses are then compared to determine which of them explains the phenomena best. When it is determined which hypothesis offers the best explanation, the inference is drawn: We infer to the hypothesis which is considered to be the best explanation of the observed phenomena (Lipton 2004 [1991], 56; Bartelborth 1996, 141).

In the case considered here, Russell starts from our immediate experience of sense-data. The inference, then, relies on a comparison of possible explanations of the fact that we experience the sense-data that we experience.[5] Among what needs to be explained is that our sense-data exhibit a certain stability. A particularly straightforward explanation of this is that sense-data are caused by stable objects existing independently of our perception. The explanation can even be taken further by appealing to laws of perspective and reflection of light (ibid., 32).

What makes an explanation a good explanation, or a better explanation in comparison with its competitors? In addition to the passage that contains the argument quoted above, Russell emphasizes the *criterion of simplicity* several more times as crucial:

> Thus every principle of simplicity urges us to adopt the natural view, that there really are objects other than our selves and our sense-data which have an existence not dependent upon our perceiving them. (Ibid., 24).
>
> [O]ur instinctive belief that there *are* objects *corresponding* to our sense-data […] tends to simplify and systematise our account of our experiences, [so that] there seems no good reason for rejecting it. (Ibid.; italics in original).

In the last quoted passage, besides simplicity, *systematicity* is also mentioned as a criterion.[6] What exactly does Russell mean by these criteria?

The criterion of simplicity is explained by Russell in a longer passage that is worth quoting in full:

> The way in which simplicity comes in from supposing that there really are physical objects is easily seen. If the cat appears at one moment in one part of the room, and at another in another part, it is natural to suppose that it has moved from the one to the other, passing over a series of intermediate positions. But if it is merely a set of sense-data, it cannot have ever been in any place where I did not see it; thus we shall have to suppose that it did not exist at all while I was not looking, but suddenly sprang into being in a new place. If the cat exists whether I see it or not, we can understand from our own experience how it gets hungry between one meal and the next; but if it does not exist when I am not seeing it, it seems odd that appetite should grow during non-existence as fast as during existence. And if the cat consists only of sense-data, it cannot be *hungry*, since no hunger but my own can be a sense-datum to me. Thus the behaviour of the sense-data which represent the cat to me, though it seems quite natural when regarded as an expression of hunger, becomes utterly inexplicable when regarded as mere movements and changes of patches of colour, which are as incapable of hunger as a triangle is of playing football. (Ibid., 23; italics in original).

The basic point is that the hypothesis of physical objects *explains* what otherwise seems "utterly inexplicable" (ibid.), and does so in a particularly simple way.[7] Now it could be objected that this consideration speaks in favor of the realist hypothesis only if compared with the relatively unspecific hypothesis that the cat consists of "mere movements and changes of patches of colour" (ibid.), which is no explanation at all. But what about the dream hypothesis, which is the competitor for an explanation of the occurrences of our experiences? As we will now see, it is at this point that the

[5] Granted, Russell considers only two possible explanations, namely realism and the Cartesian dream hypothesis. But I read the text as implying that Russell holds that no other possible explanation is better than the one he infers.

[6] As we will see below, passages from Russell's unpublished manuscript "On Matter" suggest that simplicity and systematicity are not two independent criteria, but that simplicity is one of several sub-criteria of systematicity. In *The Problems of Philosophy*, on the other hand, it sometimes sounds like they are two different criteria. The fact that Russell does not explicitly reflect on the relationship between these criteria and that his few remarks on them are not particularly precise makes a reconstruction both necessary and difficult. In my presentation of Russell's account, I follow here first the indications from the quoted passages in *The Problems of Philosophy*, which in my opinion do not provide sufficient information on the relationship between the two criteria. Therefore, I leave the question of the relation between them open for now. I am ultimately of the opinion that the clearer and more complete picture of Russell's theory emerges once we add the material from "On Matter" in a later part of this section.

[7] We will see shortly that according to Russell the explanation is simple because it relies on simple explanatory laws.

other criterion[8] mentioned by Russell, systematicity, plays a decisive role.

First of all, Russell points out that our belief in an independent external world is an *instinctive* believe, i.e. a belief we naturally have without first having to be convinced of it by an argument. He then determines the general task of philosophy with regard to instinctive beliefs as follows:

> Philosophy should show us the hierarchy of our instinctive beliefs, beginning with those we hold most strongly, and presenting each as much isolated and as free from irrelevant additions as possible. It should take care to show that, in the form in which they are finally set forth, our instinctive beliefs do not clash, but form a harmonious system. There can never be any reason for rejecting one instinctive belief except that it clashes with others; thus, if they are found to harmonize, the whole system becomes worthy of acceptance. (Ibid., 25).

As it becomes clear, the criterion of systematicity is a *coherence* criterion, though one not set out in detail by Russell (cf. Hylton 1992, 381).[9] But we at least get an impression of the basic idea: Since our belief in an independent world is an instinctive belief, *and* it can be embedded into a harmonious system with (most of our) other instinctive beliefs, it can be said to be justified at least to a certain degree. The Cartesian dream hypothesis, on the other hand, clashes with many of our instinctive beliefs, which gives us a reason to discard it, at least in case there is a better alternative.

We get even a little bit more insight into the inference at play by taking a look at a passage from "On Matter", which was written in 1912, the same year *The Problems of Philosophy* was published, but which was not published in Russell's lifetime. This manuscript is a particularly interesting document in our context, as it represents the transition from his earlier to his later position. Russell first criticizes his own very recent realist argument from *The Problems of Philosophy* and then goes on to give a sketch of what would become his constructivist position two years later in *Our Knowledge of the External World*. Let us concentrate on his own summary of his earlier argument,[10] which he calls the *inductive argument*[11]:

> One argument in favour of the existence of matter, which formerly seemed to me very strong, is the inductive argument, which may be stated, in outline, as follows: Physical science, by supposing that there is matter, is able to frame theories which fit the facts in all verifiable respects, and combine in a system many facts which would otherwise remain isolated and chaotic. The appearance and disappearance of sense-data is *primâ facie* irregular and capricious, but by supposing them caused by the interaction of matter and the observer, they can be brought under general laws which are simple and render sense-data to some extent predictable. This argument, though it has *some* weight, no longer appears to me to give any very overwhelming probability in favour of matter. (Russell 1992 [1912], 86; italics in original).

As this passage suggests, there is a close connection between the criteria of simplicity and systematicity: a hypothesis adds *systematicity* to our experiences *by unifying* them into a system through the formulation of *simple* general laws. Thus, as it now turns out, it is more appropriate to regard the criterion of simplicity as a sub-criterion of systematicity. Also, Russell now mentions as a positive argument for the existence of matter that, on the basis of this hypothesis, physical science is able to account for "*many* facts which would otherwise remain isolated and chaotic" (ibid.; my emphasis). While the postulated laws are simple, they explain not only a few singular phenomena, but a *large set of facts*, thus providing a large measure of systematic connection. This *comprehensiveness* of the resulting system is apparently also a positive justification criterion for Russell, which we can take as another sub-criterion of systematicity.

If we combine this with the earlier characterization of the argument in *The Problems of Philosophy*, the following picture emerges[12]: according to the so-called inductive argument, the hypothesis of the existence of matter is regarded as (fallibly) justified, because it offers *the best explanation* of our experiences, while "the best" is analyzed as the most systematic. The criterion of *systematicity*, in turn, consists of several aspects: an overall explanation of our experiences is the more systematic, (i) the more facts it can account for (*comprehensiveness*), (ii) under postulation of as simple laws

[8] Strictly speaking, to speak of two different criteria here will turn out to be misleading. But in the passages from *The Problems of Philosophy* quoted above, there is no clear indication of the relationship between the two criteria. See above, n. 6.

[9] Later in this section we will see in more detail what coherence, in the sense of systematicity, encompasses as a criterion according to Russell, namely the sub-criteria of comprehensiveness of the system, explanatory relations conferred by the simplest possible laws, and fit with our instinctive beliefs.

[10] We will go into the reasons why Russell, starting with "On Matter", rejects the argument under consideration here below.

[11] As will become clear, he uses the term "inductive" in a wide sense here. See above, n. 2.

[12] The criterion emerging here is reminiscent, in a rudimentary form, of the so-called unificationist account of explanation as developed in the twentieth century most notably by Michael Friedman (1974) and Philip Kitcher (1981; 1989).

as possible (*simplicity*). From the discussion above we get the additional criterion that (iii) the system should save as many of our instinctive beliefs as possible (*compatibility with instinctive beliefs*).[13]

We can analyze this inference to the best explanation used by Russell more precisely by characterizing it as a *creative abductive inference*. A creative abductive inference is an inference to the best explanation in which a new concept is introduced in the conclusion (cf. Schurz 2008, 202; 2021, 52). In the case at hand, Russell introduces the concept of real physical objects in the conclusion, a concept that does not appear in the premises, which are only statements about sense-data. The hypothesis of real physical objects is what enables the systematization of our experiences in the above sense, which justifies their postulation.[14] As we will see in the following, it is precisely this use of a creative abductive inference as a response to the problem of the external world that Russell abandons only two years later and which marks the decisive difference between his positions of 1912 and 1914.

3 *Our Knowledge of the External World*—Logical Construction and a New Kind of Realism

As Russell announces in the subtitle of his 1914 book *Our Knowledge of the External World*, he intends to consider the epistemological problem of the external world "As a Field for Scientific Method in Philosophy". At first glance, and in particular in light of the position Russell had taken only two years earlier in *The Problems of Philosophy*, this might lead one to think that he wants to apply an inductive method in the field of philosophy.

But as it turns out, by "scientific method" Russell, in 1914, means something else. In *Our Knowledge of the External World* he introduces a method from mathematics into philosophy. In the preface he explicitly mentions the fact that his new approach differs from the one in *The Problems of Philosophy* and credits Whitehead for giving him the idea of "the world of physics as a *construction* rather than an *inference*" (Russell 1926 [1914], 8; italics in original).

As he famously[15] puts it in the paper "The Relation of Sense-Data to Physics", first published in the same year as *Our Knowledge of the External World*, "the supreme maxim in scientific philosophising is this: *Wherever it is possible, logical constructions are to be substituted for inferred entities*" (1918 [1914], 155; italics in original).[16] Let us now see how this new method works.

[13] Criterion (i) can be read to include (iii) in a sense already, but it seems clearer to me to name this aspect separately. It highlights that for Russell, instinctive beliefs enjoy a special status.

[14] Creative abductive inferences play an important role in science, in particular when it comes to inferences to hypotheses about unobserved objects or properties (cf. Schurz 2008, 218 f.; 2021, 52). It is noteworthy that Russell uses an inference of this kind within a *philosophical* investigation of the problem of the external world, i.e., within *metaphysics*. This brings him close to a tradition that advocated the use of inductive methods in metaphysics, namely the tradition of inductive metaphysics, which emerged in the mid- and late nineteenth century and the early twentieth century in Germany. Representatives of this tradition include Gustav Theodor Fechner (1801–1887), Rudolph Hermann Lotze (1817–1881), Wilhelm Wundt (1832–1920), Eduard von Hartmann (1842–1906), Oswald Külpe (1862–1915), Hans Driesch (1867–1941) and Erich Becher (1882–1929). (For a general historical overview of the program of inductive metaphysics, see Scholz (2018). In addition, Engelhard, Feldbacher-Escamilla, Gebharter & Seide (2021) set the basic ideas of this tradition in relation to current debates in metaphysics.) It is noteworthy that several of the inductive metaphysicians have argued for realism with regard to the external world. In particular, Eduard von Hartmann (1885 [1871]), Oswald Külpe (1912–1923) and Erich Becher (1914, 1921, and 1926) argued for a so-called critical realism (or, as von Hartmann calls it, transcendental realism) within the framework of inductive metaphysics. Becher's argument for external world realism actually bears considerable similarity to Russell's argument. In particular, Becher uses a creative abductive inference to infer the existence of real physical objects from our perceptions. For a detailed analysis of this argument, see Seide (2021).

[15] One reason for the fame of this passage may be that Carnap placed it as an epigraph at the beginning of his early main work *Der logische Aufbau der Welt* (1928). This certainly contributed to the fact that Quine (1969, 74), for instance, understood Carnap's *Aufbau* as a consistent continuation of Russell's project of reducing the external world to sense-data. This interpretation of Carnap's *Aufbau* was contested, though, by Michael Friedman (1999), who elaborates on some important differences between Russell's and Carnap's projects and emphasizes some Kantian elements in Carnap's *Aufbau.*

[16] It may not be clear at first sight exactly which inferences Russell means at this point, which are to be substituted by constructions. The examples he uses to explain this principle come from mathematics (see in particular Russell 1918 [1914], 155 ff.). But as will become clear in what follows, his main point in *Our Knowledge of the External World* is to apply the (originally mathematical) method of construction *to philosophy*, in particular to the problem of the external world. Russell emphasizes that the new method leads to "differences between the views advocated here [in *Our Knowledge of the External World*] and those suggested in *The Problems of Philosophy*" (1926 [1914], 8). That it is the (in a broad sense) inductive inference to the real existence of external objects advocated in *The Problems of Philosophy* that he wishes to replace now is also particularly evident in "On Matter" (see above, Sect. 2). There, he directly contrasts the method of inductive inference from *The Problems of Philosophy* with the method of construction, which he will advocate in 1914.

3.1 Hard Data and Soft Data

As Russell admits, a comprehensive radical skeptical doubt cannot be disproved, and therefore, for a philosophical inquiry into our knowledge, we must at least fundamentally presuppose that we have knowledge (1926 [1914], 73). But he believes it is possible to distinguish different degrees of certainty, and he strives to build our knowledge from the most secure foundations available to us (ibid., 74).

The secure foundation he makes out, which he calls the "hard data", basically consists of two different kinds, namely "the particular facts of sense, and the general truths of logic" (ibid., 78). The particular facts of sense are the basic material for the logical constructions, and logic provides the tools. While Russell admits that "verbal doubt" with regard to these hard data is possible, he holds that "[r]eal doubt, in these two cases, would […] be pathological" (ibid.).

In contrast, "soft data" is data that can easily be put into doubt by critical reflection. As Russell points out, large parts of physics and common sense are soft data (ibid., 88 f.). As particular examples, Russell cites belief in the persistence of sensible objects while they are unperceived, and belief in the existence of other people's minds (ibid., 79).

The problem of the external world is formulated by Russell as the question: "Can the existence of anything other than our own hard data be inferred from the existence of those data?" (ibid., 80) As he himself points out, one of the difficulties to face is that we cannot rely on testimony to solve this problem, because the existence of other people's minds is part of that which is put into question. The ambitious goal, then, is to "confine ourselves to the hard data, with a view of discovering what sort of world can be constructed by their means alone" (ibid., 79). He adds:

> I think it may be laid down quite generally that, *in so far* as physics or common sense is verifiable, it must be capable of interpretation in terms of actual sense-data alone. The reason for this is simple. Verification consists always in the occurrence of an expected sense-datum. (Ibid., 88 f.; italics in original).

But as it turns out in the process, the problem presented in this way is too difficult. When Russell starts to construct the physical world and its objects, he helps himself by making additional assumptions, or rather, seemingly going against his own principles, by *inferring additional entities* that he is not able to construct. In particular, these include the sense-data of other people, as well as unsensed sensibilia, which, to put it succinctly, can be understood as the sense-data of merely possible, not actual subjects.

That he would have liked to avoid inferred entities in general is shown very clearly by several passages. For example, in "The Relation of Sense-Data to Physics", he writes:

> A complete application of the method which substitutes constructions for inferences would exhibit matter wholly in terms of sense-data, and even, we may add, of the sense-data of a single person, since the sense-data of others cannot be known without some element of inference. This, however, must remain for the present an ideal, to be approached as nearly as possible, but to be reached, if at all, only after a long preliminary labour of which as yet we can only see the very beginning. (Russell 1918 [1914], 157).

And the closing remark of the article reads:

> I should hope that, with further elaboration, the part played by unperceived "sensibilia" could be indefinitely diminished, probably by invoking the history of a "thing" to eke out the inferences derivable from its momentary appearance. (Ibid., 179).

While Russell expresses the hope that he will eventually be able to overcome this problem, he in fact never succeeded in doing so (cf. Hager 1994, 54). This means that we have to judge the theory in the state we have it. This includes the inferences to unsensed sensibilia, which we will consider in more detail in Sect. 4, and which we have to compare with the earlier inference to real objects from 1912, which Russell now rejects.

3.2 Russell's Direct Realism with Regard to Sense-Data

What exactly are the particular facts of sense? The short answer is: the *facts of our own sense-data* (ibid., 79). *Sense-data* are described in the same way as in *The Problems of Philosophy*. Examples are particular patches of color and particular noises (ibid., 83). By a *fact* of sense-perception Russell means "that a certain thing has a certain quality, or that certain things have a certain relation" (ibid., 60). Examples are "this is red" and "this is before that" (ibid., 62). *Epistemologically* speaking, the facts of sense-perception are facts we come to know without inference (ibid., 62 f.). They are "completely self-evident" (ibid. 75).

With respect to the *ontological* status of sense-data, Russell now takes a very interesting position. While he admits that there are arguments that make it plausible that sense-data are *subject*-dependent in some sense,[17] he does not regard them as *mind*-dependent. Instead, he holds that they are *physiologically* dependent on our bodies, in particular on our sense-organs and our brain (ibid., 71). This point, which is discussed at length in *Our Knowledge of*

[17] The most basic argument that suggests a subject-dependency of some sort is the variability of the appearance of physical objects, which we already know from the first chapter of *The Problems of Philosophy* (see Sect. 2 above).

the External World, comes out more succinctly in his paper "The Relation of Sense-Data to Physics". As he puts it there, sense-data are to be regarded as *physical* (1918 [1914], 150). As we will see later, sense-data are identified with aspects of physical objects, and as such they are part of the subject matter of physics.

Russell's claim that sense-data are mind-independent may seem puzzling at first. Sense-data are per definition the immediate objects of sense, which seems to imply their mind-dependence. To dispel this misunderstanding, Russell introduces the concept of sensibilia as a concept that is more general than the concept of sense-data:

> I shall give the name *sensibilia* to those objects which have the same metaphysical and physical status as sense-data, without necessarily being data to any mind. Thus the relation of a *sensibile* to a sense-datum is like that of a man to a husband: a man becomes a husband by entering into the relation of marriage, and similarly a *sensibile* becomes a sense-datum by entering into the relation of acquaintance. It is important to have both terms; for we wish to discuss whether an object which is at one time a sense-datum can still exist at a time when it is not a sense-datum. (1918 [1914], 148 f.; italics in original).[18]

Sensibilia are not mental entities, and in particular they exist independently of being sensed. As soon as they are sensed, we call them sense-data, but that does not mean that their metaphysical status changes.[19] "Logically a sense-datum is an object, a particular of which the subject is aware" (ibid., 152), and these particulars are mind-independent sensibilia.

What we have now seen is that Russell determines sense-data as the immediate objects of sense-perception and has a realist conception of them. Since they are perceived directly—in Russell's terminology, we can say that we are acquainted with them[20]—and are not inferred, we can summarize Russell's position on this as a *direct realism with respect to sense-data*.

Interestingly, Russell's direct realism does not stop here. In addition to sense-data, Russell holds that we also have acquaintance with some universals, namely *relations*, such as time-relations, space-relations and resemblance.[21] In *The Problems of Philosophy*, Russell advocates a realism with respect to relations (1959 [1912], 95 ff.).[22] He then points out that we are first acquainted with *instances* of relations between sense-data, but that through a process of abstraction from particular instances, we become *acquainted with the universals* (ibid., 102).

Although in 1914 Russell is more cautious about metaphysical assumptions of the existence of entities, his position with regard to relations has apparently not changed.[23] He explicitly includes spatial and temporal relations, as well as "some facts of comparison, such as the likeness or unlikeness of two shades of colour" (1926 [1914], 79), among the "hard data". This means that they are part of the material out of which the external world is to be constructed. And as we will see below, they are even very important ingredients.

3.3 The Construction of the External World

Now that we already have a little insight into the underlying setup, we can take a look at the execution of the construction of the external world.[24]

Russell considers the construction of space as the first task, which is the basis for the overall construction of the external world. First, he starts from the *perspectives of the individual minds* and points out that each mind perceives a complex three-dimensional world at any given moment (Russell 1926 [1914], 94). Since no two minds share exactly the same perspective, the worlds they perceive always differ at least slightly. In line with his direct realism with regard to sense-data, he does not conceive of these various perceived worlds as merely subjective phenomena, but rather holds that "each exists entire exactly as it is perceived, and might be exactly as it is even if it were not perceived" (ibid., 95).

[18] The term "sensibilia" is introduced in "The Relation of Sense-Data to Physics" and does not occur in *Our Knowledge of the External World*. But Russell takes the same position there, as he introduces unperceived perspectives (1926 [1914], 95), which boils down to the same idea.

[19] Russell admits that it is an open question "whether the objects which are at one time sense-data continue to exist at times when they are not data" (ibid., 148), but not because they are mind-dependent, but because of their *physiological dependence* on our sensory apparatus. As a result of this physiological dependence, "sense-data […] probably never persist unchanged after ceasing to be data" (ibid., 151). Still, "[t]he existence of the sense-datum is […] not *logically* dependent on that of the subject" (ibid., 152; my emphasis).

[20] Hylton (1992, 371) emphasizes Russell's notion of acquaintance as the notion that "encapsulates, and ensures, Russell's realism, for it is the point of direct contact between the mind and what is alien to it".

[21] This is emphasized by Hager (1994, 80 ff.) and Nasim (2008, 162 ff.).

[22] Russell is more cautious with regards to properties, of which he holds that we cannot strictly prove their existence, but argues for the claim that "there must be *relations*, i.e. the sort of universals generally represented by verbs and prepositions" (1959 [1912], 95; italics in original). The reason for the difference is that according to Russell, qualities can be reduced to relations of likeness between particulars, while these relations of likeness in turn cannot be reduced to anything non-universal (cf. Hager 1994, 82).

[23] As we will see below, Russell's metaphysical caution in 1914 is limited to kinds of entities with which we have no acquaintance.

[24] For reasons of brevity, I will confine myself to the presentation of the basics of the construction.

That is, instead of only one world, we now have a multiplicity of worlds, each belonging to a particular perspective. Russell then even goes one step further and assumes, in accordance with the assumption of unsensed sensibilia, that not only worlds actually perceived by minds exist, but also "an infinite number of such worlds which are in fact unperceived" (ibid.).

Next, Russell points out that although the perspectives are different, some of the different perspectives may be similar enough that a correlation can be established between them. This happens, for example, when two people can correlate objects contained in their own perspective in conversation with objects perceived by the other person. These persons can then talk about "the same table", although strictly speaking they each perceive a (slightly) different table from their perspective.

The next step is then to construct, on the basis of such relations of similarity between perspectives, a common space in which all perspectives are contained together. This common space, which Russell calls the *perspective space*, is to be distinguished from the different spaces contained in each individual perspective. The basic idea of its construction, succinctly put, is that the spatial closeness between two perspectives in this space is reduced to the degree of their similarity to each other (ibid., 96). As Russell points out, the resulting perspective space, the space we all share, has six dimensions instead of only three, because at each point in the three-dimensional physical space there is a three-dimensional perspective (1918 [1914], 162).

After this construction of a shared space, it is now possible to construct *common-sense things*, the shared objects of the physical world. Starting with an object in one perspective, say a table as it appears to me, we can combine its appearance with all the appearances of the correlated objects in other perspectives. Each appearance of the thing in one perspective—the particular color of the table I perceive, the particular color of the table you perceive—becomes an aspect of the constructed common-sense table (1926 [1914, 96). In terms of sensibilia, we can say that a thing at a certain time is defined as the class of all those sensibilia from the different perspectives that are correlated with each other and are regarded as appearances of the same thing (1918 [1914], 160). Since the correlation of the objects of different perspectives depends on similarities, the relation of similarity has a central place in the construction of physical objects. Also, space-relations within perspectives play an important role. And when we go a step further and add the dimension of time to the construction, we also have to consider the temporal relations between the classes of sensibilia that make up an object at a point in time.[25]

As we can now see, with regard to our epistemic relation to them, common-sense things are kind of a mixed bag. In part, they consist of sense-data and of relations we are directly acquainted with. In part, though, and even mostly, physical objects consist of the sense-data of other people, and even of unsensed sensibilia, which, from the viewpoint of a single observer, are both not directly perceived, but inferred entities. Let us now take a closer look into the inferences involved.

4 *Our Knowledge of the External World*—The Arguments for the Existence of Sensibilia and of the Minds of Other People

An *argument for the existence of unsensed sensibilia* is indicated in the following passage:

> We have not the means of ascertaining how things appear from places not surrounded by brain and nerves and sense-organs, because we cannot leave the body; but continuity makes it not unreasonable to suppose that they present *some* appearance at such places. Any such appearance would be included among *sensibilia*. (Russell 1918 [1914], 150; italics in original).

I want to suggest that the most straightforward way to understand this argument is to analyze it as an inference to the best explanation.[26] To see that, we have to understand why Russell mentions *continuity* as the reason for supposing that sensibilia exist. What does he mean by that? This is illustrated by an example from *Our Knowledge of the External World*:

> If two men are sitting in a room, two somewhat similar worlds are perceived by them; if a third man enters and sits between them, a third world, intermediate between the two previous worlds, begins to be perceived. It is true that we cannot reasonably suppose just this world to have existed before, because it is conditioned by the sense-organs, nerves, and brain of the newly arrived man; but we can reasonably suppose that *some* aspect of the universe existed from that point of view, though no one was perceiving it. (Russell 1926 [1914], 95; italics in original).

[25] As Hager (1994, 91 ff.) points out, this aspect of Russell's construction of physical objects is often overlooked in the secondary literature, in part because in his formulations, Russell often confines himself to the preliminary step of constructing an object *at a point in time*. Hager argues that this is a relevant point, though, because the case of time-relations highlights the central role of relations in Russell's construction of physical objects.

[26] The caveat formulated in n. 3 above also applies in this case, of course.

Our experience shows that in principle (apart from practical obstacles like the extension of our bodies) it is always possible to take an intermediate perspective between any two perspectives, however similar they may be. The explanation Russell supposes here is that for every possible perspective, there *actually* exists a possible private world of a possible observer, even if the perspective is not occupied at the moment (ibid., 96). In terms of sensibilia, this means that for every possible perspective there exist sensibilia presenting a world, even in case the sensibilia are unsensed. This hypothesis accounts for a continuous transition between each two occupied perspectives.

Before we compare this inference to the best explanation to the one Russell uses in *The Problems of Philosophy*, let me note that in this argument, Russell takes the *existence of other persons and their sense-data* for granted. How can *this* assumption be justified in turn? Russell suggests two arguments for this, namely an analogical inference and, again, an inference to the best explanation.

First, Russell points out that "[t]he obvious argument is, of course, derived from analogy" (ibid., 102): we can perceive the bodies of other people, bodies that look similar to our own and behave in a similar way to ours when we have certain thoughts or feelings. It suggests itself to infer by analogy that the behavior of these bodies is related to thoughts and feelings, just like in our own case.

Russell does not think that this is a strong argument, but as he notes, it can be easily developed into an inference to the best explanation, with the analogy only providing the inspiration for the explanation:

> The hypothesis that other people have minds must, I think, be allowed to be not susceptible of any very strong support from the analogical argument. At the same time, *it is a hypothesis which systematizes a vast body of facts* and *never leads to any consequences which there is reason to think false*. There is therefore nothing to be said against its truth, and good reason to use it as a working hypothesis. (Ibid., 103; my italics).

Just as he did in *The Problems of Philosophy*, Russell here indicates *systematicity* as a standard of evaluation for explanations. The details of the idea of systematicity in play here remain vague. But at least the *comprehensiveness* of the system is particularly emphasized: the new hypothesis "enables us to extend our knowledge of the sensible world by testimony, and thus leads to the system of private worlds which we assumed in our hypothetical construction" (ibid., 103 f.).[27]

As we can see here, Russell does allow for inferences to the best explanation even in 1914. The main criterion mentioned for evaluating explanations – systematicity – at least overlaps with the one he used in *The Problems of Philosophy*. A particularly important question, of course, is why Russell now so rigorously rejects the explanation that our sense-data are caused by things-in-themselves,[28] although he classified it as the best explanation of our experiences in *The Problems of Philosophy*.

5 Simplicity Given Up?

The first question that arises in this context is what role simplicity plays in the new approach. As we have seen in Sect. 2, simplicity plays a significant role in the 1912 approach, as a sub-aspect of systematicity. However, simplicity is not specifically mentioned in the argument just discussed.

First of all, it becomes clear that Russell's assessment of the simplicity of the hypothesis of the existence of things-in-themselves has not changed in 1914[29]:

> [I]f I look at the moon on two nights a week apart, there is a very close causal connection between the

[27] As we will see below, though, Russell's new approach does not perform well in terms of the criterion of simplicity, though.

[28] Russell does not use the term "things-in-themselves" for external objects in *The Problems of Philosophy*, but introduces it (or rather the singular form "thing-in-itself") in *Our Knowledge of the External World* to signify what he called external objects in the earlier book: A thing-in-itself is "something which, together with us and our sense-organs, causes our sensations, but is never itself given in sensation", and the most basic example is a table, which, according to the theory he now rejects, "must be quite different from the sense-data to which it gives rise" (1926 [1914], 92). The reason for the introduction of this term in *Our Knowledge of the External World* is probably that Russell in 1914 still believes in the existence of external physical objects (as witnessed by the title of his book, *Our Knowledge of the External World*), with the notable difference that he now identifies them with collections of sensibilia. In order to be able to contrast his new account with his old one, he needs a distinctive term for what he called "physical objects" in 1912—the objects he now wants to erase from his ontology–, and therefore names them "things-in-themselves".

The term "things-in-themselves" is of course inherited from Kant. In Russell's use of the term, it is stripped from Kant's theory of transcendental idealism, according to which space and time are ideal, with the result that according to Kant, things-in-themselves are not in space and time. In accordance with the passages quoted at the beginning of the present footnote, I read Russell as entertaining a definition of "things-in-themselves" according to which things-in-themselves are objects that (i) are different in nature from our sense-data and (ii) are the causes of our sensations.

[29] As outlined in n. 28 above, Russell did not use the term "things-in-themselves" in 1912, but simply called them physical objects. For the reasons why it is better to use the term "things-in-themselves" to formulate his 1912 hypothesis from the perspective of his 1914 account, see again n. 28.

> two sense-data. *The simplest, or at least the easiest, statement of the connection is obtained by imagining a "real" moon* which goes on whether I look at it or not, providing a series of possible sense-data of which only those are actual which belongs [sic] to moments when I choose to look at the moon. (Russell 1926 [1914], 89; my italics).

The reason why Russell, even in the light of this estimation, now prefers constructions on the basis of sensibilia over an inference to things-in-themselves, is that sensibilia, in contrast to things-in-themselves, are not entities of a kind that needs to be newly introduced through an inference. In other words, the inference to the best explanation that Russell makes use of in 1914 is precisely not a *creative* abductive inference, and this is what makes it permissible in his view. This becomes clear when he refers to a version of Occam's razor to justify his approach:

> The above extrusion of permanent things affords an example of the maxim which inspires all scientific philosophizing, namely "Occam's razor": *Entities are not to be multiplied without necessity*. In other words, in dealing with any subject-matter, find out what entities are undeniably involved, and state everything in terms of these entities. (Russell 1926 [1914], 112, italics in original; see also 1918 [1914], 155).

The main motivation for this criterion is apparently the *degree of certainty* of the existence of the entities postulated in the hypotheses under consideration. In the case of sensibilia, we at least know for certain that entities *of this kind* exist, because we have a direct epistemological access to some of them (our own sense-data). With regard to things-in-themselves, this is not the case: "the common-sense belief in fairly permanent and fairly rigid bodies […] is a piece of audacious metaphysical theorizing" (Russell 1926 [1914], 107).

The criterion Russell relies on here—the version of Occam's razor cited in the last quoted passage—is of course also a criterion of simplicity. But while in the criterion of simplicity favored in *The Problems of Philosophy* simplicity is conceived as the *ability of the hypothesis to systematize our experiences* via *the formulation of simple laws*, the new criterion favors hypotheses that are *simpler with regard to their general ontological commitments*.[30]

It is also worth noting that Russell's new theory gives up simplicity in at least three other meanings of the term compared to his older realist hypothesis[31]:

1) The simplicity of physical objects: the *particular physical objects* constructed from the sensibilia look *much more complex* than the physical objects postulated by Russell in 1912. According to Russell's new theory, each physical object consists at any time t of *infinitely many* sensibilia, each of them representing a different potential perspective of a potential observer on the constructed object at that time. Here, all potential perceivers and their different perceptual setups (such as their particluar eyes, brain, etc.) would have to be considered at all points in space that are in a line of sight to the object (cf. Leerhoff 2008, 131). All the different sensibilia which are part of these indefinitely many possible perspectives would be part of the object, which makes the object a rather crowded bundle of sensibilia.
2) Simplicity of the physical world: Connected to the last point is the fact that according to Russell's theory the whole physical world, including physical space, is much more complex than according to the standard realist picture. In particular, as Russell points out, according to his theory, space has six dimensions instead of only three, because at each point in the three-dimensional physical space there is a three-dimensional perspective (1918 [1914], 162), which consists of the appearance which the universe presents from this particular point of view (ibid., 160).
3) Simplicity in terms of the number of the postulated occurrences of basic entities: Russell's version of Occam's razor limits the number of the postulated *types* of entities, in particular to those types of entities we are acquainted with. But Russell's theory does not fare well with regard to the number of the postulated *occurrences* of the basic entities of his theory. According to his theory, the basic entities of the world are sensibilia: they "are to be recognised as the ultimate constituents of the physical world" (Russell 1918 [1914], 152). And as the first and second point above jointly make clear, Russell has to postulate quite a lot of these entities.

As these considerations make clear, Russell sacrifices a lot of simplicity for the one kind of simplicity he favors. What are his reasons for doing so?

[30] It has to be stressed, though, that Russell's use of Occam's razor does not mean that he is in favor of a strict ontological parsimony in the sense of nominalism (cf. Hager 1994, 85 ff.). In fact, as we have seen above, Russell advocates a realism with regard to relations, and relations even play a crucial role in the construction of physical objects.

[31] As we will see below, Russell formulates an argument against simplicity as a criterion for theory choice in the manuscript "On Matter". Thus, he was obviously aware of the lack of simplicity of his new theory, but did not evaluate this as a striking objection.

To explore Russell's reasons for abandoning simplicity as a criterion, it is worth taking another look at the manuscript "On Matter", where he criticizes his old inference to the real existence of external objects.

The background of the self-critique is Russell's conviction, already expressed in *The Problems of Philosophy* (1959 [1912], 60), that all knowledge of existence rests on "(1) immediate acquaintance, which assures us of the existence of our thoughts and feelings and sense-data […]; [and] (2) general principles, according to which the existence of one thing can be inferred from that of another" (Russell 1992 [1912], 80). In the case of standard enumerative induction, the relevant principle is a principle of the uniformity of nature according to which the future resembles the past (ibid., 81). Due to the nature of this principle, it is clear that it cannot lead us from sense-data to something completely different from sense-data, such as external objects, since it only allows us to infer the *similarity of previously unobserved cases to already observed cases*. Thus, the inference to external objects has to rely on a different principle.

In his self-critique Russell formulates the required principle and immediately rejects it:

> The argument from simplicity, to begin with, is merely teleological; and has absolutely no weight whatever. If it were known that the universe had been created for the purpose of delighting mathematicians, there would be some reason to suppose that, *of two hypotheses which both fit the facts, the simpler is more likely to be true*. As, however, there is no evidence that this is the purpose of the universe, there is no reason whatever to expect the true laws of nature to be simple. (Russell 1992 [1912], 86; my emphasis).

As this passage reveals, the principle on which the argument from *The Problems of Philosophy* is based is a principle of simplicity (cf. Hylton 1992, 386). However, seeing no reason why the world should do us the favor of being simple, he now rejects the principle and accordingly rejects the argument. Accordingly, Russell would now not accept the criticism I formulated above, according to which his new theory is deficient because the constructed external world lacks simplicity in several respects.

This rejection, although it has an initial plausibility, has certain difficulties in the context of Russell's overall position. First of all, as Russell makes clear, we have no justification for the principle of enumerative induction either. The only argument in favor of its use is that we depend on it if we are to study the world empirically at all.[32] But, of course, this is not an argument which shows that it is the case (or at least probable) that the world actually conforms to the principle. It seems a little arbitrary to reject the principle of simplicity on the one hand because there is no justification for it, but on the other hand to admit the principle of uniformity of nature as the basis of our investigations, although it also seems unfounded.

Furthermore, it should also be noted that ironically, the principle of uniformity is also a principle of simplicity. What it assumes, basically, is that future cases fall under *the simplest general law* consistent with previous observations.[33] As we have already seen in Sect. 2, Russell identifies the criterion of simplicity underlying the criticized argument for the existence of external objects with a *simplicity of explanatory laws* (Russell 1992 [1912], 86). Strictly speaking, then, the principles of simplicity and enumerative induction are not far apart, with the only (and notable) difference being that the criticized principle of simplicity allows inferences to unobservable entities, provided this is conducive to simplicity.[34] Even though the principle of enumerative induction is weaker in this sense, Russell's willingness to rely on this principle causes some headaches against the background of his general criticism of the assumption of the simplicity of the world.

Another point that needs to be made is that Russell, as we have seen above, relies on inferences in the context of his new approach, namely to the existence of sense-data of "all possible observers" (Russell 1992 [1912], 94). He recognizes that "[t]his view still uses an à priori principle by which it draws inferences from what is actually given in sense to what is not actually given, but the principle which it uses seems less precarious and much more self-evident than any which can be used by a less naively realistic theory" (ibid.). As we have seen in Sect. 4, the principle this inference invokes is also a kind of *principle of systematicity*, with the aspect of comprehensiveness playing a central role. And again, we can ask a similar question as before: Why should the world do us the favor of being precisely such that large sets of facts are closely interconnected rather than being isolated from one another?[35] Granted, just as the principle

[32] This is a position that has not changed by the time he wrote *Our Knowledege of the External World*, where he expresses the same agnostic position with regard to the principle of (enumerative) induction (Russell 1926 [1914], 46; cf. Hylton 1992, 383).

[33] In *The Problems of Philosophy*, Russell writes: "The belief in the uniformity of nature is the belief that everything that has happened or will happen is an instance of some general law to which there are *no* exceptions." (1959 [1912], 63; italics in original).

[34] Against this background it seems plausible to me to regard the principle of the uniformity of nature as a special case of the principle of simplicity. This roughly corresponds to the position of Harman (1965), who, on the basis of a similar consideration, takes enumerative induction to be a special case of inference to the best explanation. See in particular Harman (1965, 90 f.).

[35] I take it for granted here that coherence does not consist in the mere absence of inconsistencies, but includes positive connections between the elements of the system, e.g. brought about by laws. I

of enumerative induction, this principle is weaker than the principle of simplicity he criticizes, in that it does not allow for inferences to unobservable entities. But if Russell thinks that the principle of simplicity is unfounded, his insistence that the principle of systematicity in use here is "much more self-evident" (ibid.) is puzzling. The rejection in principle of inferences to unobservable objects seems arbitrary, especially against the background of the fact that inferences to unobservable, theoretical entities are relatively widespread in science.

6 Conclusion

As we have seen, Russell's main motivation for introducing the new method of construction into philosophy is mainly to avoid inferences to unobservable objects. The result is a theory of the physical world that lacks simplicity in several respects (in the sense of the three forms of simplicity described in Sect. 5) and that seems overly artificial. Russell brings forward an argument against the principle of simplicity as a criterion for theories, but this argument could be made in a similar form against any kind of inductive principle, including those on which he wishes to continue to rely. Russell's rejection of simplicity as a criterion for theory choice thus seems relatively arbitrary.

To give a final assessment, it seems to me that Russell's 1914 attempt to establish a more direct variant of realism remains inconsequential and problematic. The resulting theory of the physical world loses so much in simplicity that the gain from avoiding the postulation of unobservable objects at any price seems comparatively marginal.

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Footnote 35 (continued)

think it is fair to assume that this is what Russell has in mind when he speaks of systematicity.

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