

# AGAINST WATKINS: FROM A POPPERIAN POINT OF VIEW \*

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This paper deals with Watkins's attack on Popper's Theory of Science (*PTS*). Watkins claims that Popper's theory of verisimilitude (together with his theory of corroboration) introduces justificationist and inductivist elements into *PTS*. The aim of the paper is to show that Watkins's accusation is false. In *PTS* there is no good (positive) reason for any conjecture. Similarly, there is no way how any conjecture could be attained by means of induction.

## Introduction

The issue of this paper has been provoked by the astonishing worry about the finding that *either we know something* ('know' in the traditional sense) *or not* (and there is *no* third possibility) by which are haunted some critical papers on Popper's theory of science. The paper I have in mind now is Watkins's *Popperian Ideas on Progress & Rationality in Science* (Watkins 1997) which contains an attack on Popper's theory of science (hereinafter called *PTS*). This attack results in the following condemnation: 'His [Popper's] later philosophy was tainted by justificationism as well as by inductivism' (1997, § 20).

Watkins's accusation is very simple. First, he claims that according to *PTS* 'we can know, or at least have reason to believe, that we are making progress with respect to truth' (*op. cit.*, § 16) and this is surely a justificationist element. Secondly, Popper says that '[i]f two competing theories have been criticized and tested as thoroughly as we could manage, with the result that the degree of corroboration of one of them is greater than that of the other, we will, in general, have *reason to believe* that the first is a better approximation to the truth than the second' (Popper 1982, p. 58). This passage is sufficient for Watkins for his conclusion that '[i]n short, corroboration-appraisals provide some justification for the corresponding verisimilitude-appraisals ... It seems clear that an inductive element has been let in here'

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\* I am indebted to David Miller for his useful e-mail comments on earlier draft of this paper. However, the responsibility for potential mistakes is mine.

(1997, § 16 & 17). What can be worse for *PTS* 'whose proud claim was to have dispensed with induction' (*op. cit.*, § 17)?

However, in this paper I will try to show that Watkins misread some Popper's texts, the one quoted above included. Although some passages from (Popper 1982) are not unambiguous, I will suggest their new interpretation and also several arguments for its defence against Watkins's interpretation. But there will be no room for its justification.

### 1. Watkins's argument

The structure of Watkins's argument in his (1997) is following:

1. in § 11 he assumes 'for argument's sake that an adequate definition [of verisimilitude] exists'.
2. in § 15 he reminds that Popperian corroboration-appraisals are 'analytic' and that critics of *PTS* have often asked 'why the best corroborated theory is the best theory'?
3. in § 16 Watkins says bluntly that 'he [Popper] used it [his theory of verisimilitude] to turn what many saw as a pessimistic philosophy, in which the truth is permanently hidden, into an optimistic philosophy in which we can know, or at least have reason to believe, that we are making progress with respect to truth' because 'corroboration ... though not a measure, is an *indicator* of verisimilitude'. Then, only few lines later, Watkins quotes the passage from (Popper 1982, p. 58) and pronounces the previously mentioned conclusion (see the second paragraph of this paper).
4. in § 17 Watkins accuses *PTS* of inductivism because it enables us to 'proceed from evidence as to how [one theory]  $T_1$  and [another theory]  $T_2$  have performed under test in the past via a corroboration-appraisals to a verisimilitude-appraisals and thence to a conclusion about their relative reliability in the future'. In short, Watkins claims that there is an inductive inference *from* the 'analytic' corroboration-appraisals *to* the 'synthetic' verisimilitude-appraisals in *PTS*<sup>1</sup>.
5. in § 20 Watkins asserts, with reference to (Popper 1982, p. 20), 'that by a theory being preferable to another he [Popper] meant that we have *reasons* to think it a *closer approximation to the truth*' and that these reasons are positive or justificationist. So he arrives at the

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<sup>1</sup> This summary of Watkins's accusation was elucidated to me by David Miller in our e-mail conversation from January 6, 2003

condemnation of inductivism and justificationism (see the third sentence of this paper).

Watkins sums up his critique of *PTS* again in § 23 in which he says that *PTS* 'treat[s] corroborations as indicators of verisimilitude, thereby surreptitiously turning a justification for a preference for a theory into a justification of the theory' because '[o]nce it is accepted that justification allows of degrees, it seems clear that to justify a preference for a theory with respect to verisimilitude would tend to justify the theory itself' (1997, § 20). This way, Popper's answer to the question 'Why the best corroborated theory is the best theory?' (stated in (2) above) would be 'Because it is more truthlike than all the other competing theories and *we can know it*, or at least have *positive reasons* to believe that it is like that'.

But the truth is that, according to Popper, *we cannot know it* and that *we do not even have positive reasons* to believe in it. In the following text, I will try to explain why this is so and why Watkins's accusation and condemnation are miscarriages of his justice.

## 2. The problem of rational belief

I will begin by the frequently quoted passage from Popper's (1982, p. 58) (see the introduction) where he talks about our 'reason to believe'. This passage should be read in the whole context of *the subsection II* (*op. cit.*, pp. 56-62) which is, as Popper reminds us, devoted to the problem of rational belief (*op. cit.*, p. 56). There is an important Popper's emphasis: 'My view that it [i.e. the problem of rational belief] is less fundamental and interesting than the first [i.e. so called Russell's challenge<sup>2</sup>] is ... due to the fact that no really new ideas are needed to meet it' (*op. cit.*, p. 57). So one should read *the subsection II* in a close connection with *the subsection I* (which is devoted to the first problem) if not in the whole context of *the chapter I* which is devoted to the problem of induction in general. Only this way one can understand why 'no new ideas are needed to meet' the original problem. This is what Watkins omits and what leads him astray. Because at the end of *the subsection I* (*op. cit.*, p.56) Popper says: 'Only after questions about the explanatory value and testability of the two theories have been resolved may we say of them whether they are really competing with each other and whether they can be subjected to crucial observational tests which may decide against one of them

<sup>2</sup> 'Russel's challenge ... may be formulated as the question 'What is the difference between the lunatic and the scientist?'' (Popper 1982, p. 53) See *op. cit.*, pp. 53 - 56 for details.

and thereby show that the other is 'better'. In this way we may in the end come to say ... that we have a theory which, according to the present state of our critical discussion, including observational tests, appears to come nearer to the truth than all the others considered'. If we keep in mind these words, we can proceed to *the subsection II*, that is to the original problem, the problem of rational belief.

### 3. Reasonable preference

In *the subsection II* Popper says straightforwardly that 'the object of our 'rational belief' is ... not the truth, but ... *the truthlikeness* (or '*verisimilitude*') of the theories of science' (Popper 1982, p. 57). And he claims that 'it is ... possible to say of a theory not yet corroborated that it is *potentially* better than another; that is to say, that *it would be reasonable to accept it as a better approximation to the truth, provided it passes certain tests*' (*op. cit.*, p. 58; the latter emphasis is mine). Now the following question arises: 'Why is it *reasonable* to accept such hypothesis tentatively<sup>3</sup> as a better approximation to the truth?' Personally, I think that the correct answer (which, in my opinion, is also that of Popper) could be: 'Because this hypothesis is better corroborated and thus it *may* have a greater truth-content and a lower falsity-content than another competing hypothesis in this field, i.e. *it may* be closer to the truth. It *may* be so but we *cannot know* it'. This answer is in accordance with Popper's emphasis that 'a preference for a theory may be called 'reasonable' if it is arguable, and if it withstands *searching critical argument* – ingenious attempts to show that it is not true, or not nearer to the truth than its competitors. Indeed, *this is the best sense of 'reasonable' known to me*' (*op. cit.*, p. 59). It is also in accordance with his original text (Popper 1963, pp. 233-235) where he introduced the idea of verisimilitude. Thus it is reasonable to accept the corroborated theory ( $T_2$ ) as a better approximation to the truth *than another theory ( $T_1$ ) which has been refuted*. If our aim is to find the truth or to get nearer to it and if we have to (or want to) choose between  $T_1$  and  $T_2$  then we should prefer  $T_2$ .

### 4. Corroboration & preference

At this moment, one may ask: 'All right, but what can *corroborations* do for our problem of preference?'. The answer is the same as before: 'As positive reasons or justifications, they can do *nothing*. But the corroborated theory

<sup>3</sup> It may sound strange to some readers but, according to PTS, *any* acceptance of *any* hypothesis is *only tentative*, i. e. hypotheticalal & ephemeral (or, if you like, temporary)

*may be* more truthlike than the false one and it *may be* even true and that is what we want'. However, my imaginary opponent could continue by the question: 'But if we *cannot know* that  $T_2$  is true or more truthlike than  $T_1$  how can 'we have good reason to believe that some of our present [theories] are *more truthlike* than some alternatives' (Popper 1982, 61)?' This way, we enter an important field of our problem where, according to Popper, 'no really new ideas are needed to meet it' (*op. cit.*, p. 57). And the answer is really the same as before: 'We *do not know* whether  $T_2$  is more truthlike than  $T_1$  or not since our preference for  $T_2$  is a *risky guess*. But  $T_2$  may be more truthlike and this is our 'good reason' to prefer  $T_2$  (or better: and therefore it is *reasonable* to prefer  $T_2$ )'. Now I imagine that my opponent looks all wonder and asks with passion again: 'But what on earth are these 'good reasons' *if not* something what enables us to *know*?' Clearly, my opponent has been upset by the dilemma that *either we can know* something *or not* and there is no third possibility. Because *if* Popper claims that we *cannot know* that some theory is more truthlike than another, *how can we have good reasons* for our belief that it is so? Well, let us inquire!

These 'good reasons' are positive results of tests, i.e. positive degrees of corroboration. For we consider a situation where  $T_1$  has been *refuted* (i.e. its degree of corroboration is negative) and  $T_2$  *corroborated* (i.e. its degree of corroboration is positive). I can fairly limit my interest to the corroboration-appraisals because the core of Watkins's accusation is that it is them what 'provide[s] some justification for the corresponding verisimilitude-appraisals' (1997, § 16). Anyway, I will suggest later that we have other 'good reasons', too. But now I have to resolve our dilemma.

First, we should keep in mind that the 'fact' that  $T_2$  has been corroborated means that  $T_2$  *may be* true or more truthlike than  $T_1$  *just as* it *need not be* like that (i.e. neither true nor more truthlike than  $T_1$ ).<sup>4</sup> Clearly, *if* we want to use this 'fact' as a *positive* reason which *could justify* our preference for  $T_2$  *then* this would be absurd. If someone tried *to justify* something by the declaration that it *may be so just as* it *need not be so* then he *would justify nothing*. Because such a declaration is *no positive reason* at all. One who sums up a serious discourse with you and your neighbour by the words: 'Maybe I'm telling you more truth than your neighbour but it need not be so' does not justify by this confession that what he has said to you earlier was, indeed,

<sup>4</sup> Because  $T_2$  can be refuted *at any time* and *if it is* (i.e. *if it is false*) then it *cannot be* more truthlike than  $T_1$  thanks to the logical defect of Popper's qualitative definition of verisimilitude which was discovered by David Miller and Pavel Tichý independently. See (Miller 1974) and (Tichý 1974) for details

more truthlike. But then: what does it mean when I say that the corroboration may be a 'good reason'?

### 5. Critical arguments vs. positive reasons

Well, it is the time to consult *the subsection II* from (Popper 1982, pp. 56-62) again. In its end Popper says: 'We cannot justify our theories, or the belief that they are true; nor can we justify the belief that they are near to the truth. We can, however, rationally defend a preference ... for a certain theory, in the light of the present results of our discussion' (*op. cit.*, p. 61). Thus, our inquiry leads us to the question: 'How can we *rationally defend a preference* for a certain theory by 'good reasons' and what has it in common with corroboration and verisimilitude?'

However, only a negligent reader of (Popper 1982) can be startled by this question. Because Popper has already answered it *in the same chapter*, namely in *the section 2*, on page 20. Surprisingly enough, Watkins quotes this page too (see his 1997, § 20).

I have said 'surprisingly' because he did not pay enough attention to it. If he had, he would not have brought the accusation against Popper. For, on this page, there is a crucial passage which offers an answer to our last question and which also resolves our dilemma stated in the section 4 above. Here it is: 'We can often give reasons for regarding one theory as preferable to another. They consist in pointing out that, and how, one theory has hitherto withstood criticism better than another. I will call such reasons *critical reasons*, in order to distinguish them from those *positive reasons* which are offered with the intention of *justifying* a theory ... But although critical reasons can never justify a theory, they can be used to defend (but not to *justify*) our *preference* for it: that is, our deciding to use it, rather than some, or all, of the other theories so far proposed' (Popper 1982, p. 20).

This passage will also be crucial for my defence of Popper against Watkins<sup>5</sup>. On the one hand, Watkins does not notice the distinction mentioned above, on the other, he informs us (in his 1997, § 20) about another distinction 'between three problems: that of adjudicating between competing scientific theories, that of justifying scientific theories, and that of showing one scientific theory to be *preferable* to another' made by Popper in his (1982, pp. 19-20). Then Watkins says that Popper's 'idea was to leave out justification and solve the problem of adjudication via the problem of preference' (1997, § 20). Now one would expect that Watkins will explain

<sup>5</sup> See also (Miller 2002, especially pp 12-13)

this great idea further and will keep in mind the crucial passage mentioned above. But instead of this, he concludes harshly that after Popper's great idea 'comes a big letdown' since Popper 'added that by a theory being preferable to another he [Popper] meant that we have *reasons* to think it a *closer approximation to the truth*' (*ibid.*). However, it should be clear that the reasons which Popper has in mind are *the critical reasons* (or, better, *critical arguments*) and *not the positive* (or justificationist) *reasons*. Let me analyze this point in detail.

## 6. Corroborations *qua* critical arguments

I have already said that the corroboration-appraisals of competing theories occur among our critical arguments. The problem is: 'Could we use the 'fact' that  $T_2$  has been corroborated by a certain observational test while  $T_1$  has been refuted by it as a *critical reason* for *the defence* of our idea that  $T_2$  is more truthlike than  $T_1$ ? And if we could, *in what sense* is it a 'good reason'?'

The first question can easily be answered like this: 'Of course we could because we want to prefer the more truthlike theory and whereas  $T_2$  *may be* more truthlike than  $T_1$  the contrary *does not hold*'. Note that although we can *defend* our preference in this way it is not possible to *justify* it like that (as I have tried to show above – see the last paragraph of the section 4). Once we realize that our corroboration-appraisals occur among our *critical* reasons and *not* among our *positive* reasons (which do not exist), we also realize that it is by these critical reasons we *defend* our *preference* for one of competing theories but we *do not* justify it by them. We are only explaining *why* we think that some hypothesis *seems to be* better than another. But if this is so, why is there a *reason to believe* that this is so? In what sense can critical reasons be called 'good reasons'?

This is the second question as posed above. No new ideas are needed to meet it again and the answer is quite simple. It is as follows: 'Our 'good reason' or 'critical reason' or 'reason to believe' that the corroborated theory ( $T_2$ ) is also one which is closer to the truth than the refuted one ( $T_1$ ) simply consists in the 'fact' that *if* the result of the crucial test between  $T_1$  and  $T_2$  is correct<sup>6</sup>,  $T_1$  *cannot* be closer to the truth than  $T_2$ '.

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<sup>6</sup> The sentence 'if the result of the crucial test . . . is correct' is *not* a new idea. Because *if* we are to be able to say that a certain theory *was* corroborated or refuted by some test statement (or by the result of the crucial experiment) *then* we have to agree on the truth value of such statement *in advance*. So there is a conventionalist element from the beginning. But *no* justificationist or inductive element yet

## 7. Against induction

So far I have only shown that Watkins is not right to accuse *PTS* of a justificationist element. I have tried to explain why there is *no room* for justification of our verisimilitude-appraisals. Now I will try to show that there is no room for induction as well.

Clearly, I can avoid induction *qua* justification because if I showed above that there is no room for justification of our verisimilitude-appraisals in general, then I showed that there is no room for induction *qua* justification, too. But some philosophers constantly play *either* with the idea of induction *qua* ampliative inference or with the idea of induction *qua* discovering procedure. The latter possibility is of *no* interest for our issue here because it would be absurd to claim that Popper has, *in fact*, discovered his theory of verisimilitude thanks to (for example) his theory of corroboration. We should already know from his paper introducing verisimilitude (Popper 1963, chapter 10) that he 'combine[s] here the ideas of truth and of content into one – the idea of ... verisimilitude' (*op. cit.*, pp. 232-233). So the first possibility – induction *qua* ampliative inference – is also *the last* possibility which I have to inquire if I want to do justice to Watkins's accusation. And his (1997) really contains some paragraphs (namely § 17 & 20) indicating that he occasionally belonged to the first group of players just mentioned.

It is especially § 17 which is forged a little better so I will need some more space to melt it. Watkins 'consider[s] the following scenario' (1997, § 17) which I will abridge. One theory ( $T_1$ ) entails a prediction which is in conflict with a competing prediction entailed by another theory ( $T_2$ ). These predictions were not tested yet but  $T_1$  and  $T_2$  have been tested in other places and  $T_2$  was better corroborated than  $T_1$ , which gives us a reason to believe (as Popper says) that  $T_2$  is nearer to the truth than  $T_1$ . But if this is so then (according to Watkins) 'we surely have some reason' to prefer *the so far untested* prediction of  $T_2$ . And this is, of course, an inductive inference. Moreover, Watkins says that the prediction of  $T_2$  is 'worthy of being relied upon' (*op. cit.*, § 17). But note that there is no horse in *PTS* which could fit this shoe. Popper says right away: 'My refusal to bet on the survival of a well corroborated theory shows that I do not draw any inductive conclusion from past survival to future survival' (Popper 1982, p. 65). So *what reason could we have* to prefer (or rely upon) *the so far untested* prediction as Watkins persuades us? Surely we have *no* such reason and this is a straightforward consequence of the fact that, according to *PTS*, we only appraise in our critical discussions *the past performance* of competing theories as stated in the corroboration-appraisals.

What leads Watkins astray seems to be tolerably clear. It is his belief that ‘corroboration-appraisals provide some justification for the corresponding verisimilitude-appraisals’ (1997, the end of § 16). Because *if it could be so then* we ‘surely would have some reason’ to prefer *the so far untested* prediction of  $T_2$ . *But*, as we have seen, *it cannot be so*. Moreover, we are not moving from the corroboration-appraisals *to* the corresponding verisimilitude-appraisals as Watkins suggests. Thus, the second *Watkins’s mistake* consists in his opinion that *there is an ampliative inductive inference from corroboration to verisimilitude in PTS*<sup>7</sup>. And this mistake has caused a plenty of Watkins’s mistaken conclusions. One of them is that *PTS* enables us to proceed from evidence about past instances to a categorical or at least probabilistic conclusion about the next instance (1997, § 17). But, I stress again, there is *no move* from corroboration to verisimilitude which ends in ‘categorical’ or ‘probabilistic conclusion’. Something that tells us that something else *may be so just as it need not be so*, *cannot* be an inductive inference, which shows that there is *no inference* of such kind. More exactly, something that tells us that  $T_2$  *may* be more truthlike than  $T_1$  *just as it need not be so*, *cannot* clearly *be* either ‘probabilistic’ or ‘categorical conclusion’ at all. It is only our *unjustifiable guess*. And (as David Miller has put it<sup>8</sup>) ‘since a conjecture is not an inference, it is neither deductive nor inductive’. This makes all the difference. Throw away the horse shoe and try to forge a better one!

### 8. The aim of science *qua* roadsign

One important point has to be added. If we come, in the end, to *the conjecture* that the better corroborated theory *may be* also the more truthlike one and if we decide to *prefer it* then this preference will be *a result* of our critical discussion which contains not only the corroboration-appraisals but also a plenty of conventionalist elements. Our preference is *not based*, I stress again, on the (inductive) move from corroboration-appraisals to corresponding verisimilitude-appraisals as Watkins suggests (see (4) in the section 1 above). It is *not based* on anything. There are *no grounds* (or good reasons in David Miller’s terminology – see his 1994, chapter 3) for it. It is only our *risky preference* because ‘every choice remains a risky guess ... most worthy of *further critical discussion* (rather than of *acceptance*)’ as Popper reminds us in his paper introducing verisimilitude (1963, p. 218, footnote 3). Moreover, it is *a result of our critical discussion which is synthetic* (Popper 1972, p. 84) and

<sup>7</sup> This mistake accompanies Watkins since his (1984, pp. 283-288).

<sup>8</sup> E-mail communication with D. Miller from May 14, 2003.

therefore *there seems to be indeed no room* for the inductive move from 'analytic' corroboration-appraisals to 'synthetic' verisimilitude-appraisals as Watkins suggests (see (4) in the section 1 above).

But if our choice for the better corroborated theory is *not* caused by any inductive inference what are our motives for it then? Well, these motives are determined *by our aim* and our aim is to find the truth or at least to get nearer to it.

I think that this is the right time to say a few words about the aim of science in general. Because, as I will argue, Watkins arrives at his accusation against *PTS* also thanks to his conception of the aim of science, different from that of Popper. In (1997, § 13) he says that '[i]f one is to aim at X, and pursue one's aim rationally, one needs to be able to monitor the success or failure of one's attempts to achieve X'. Then he considers 'a simplified version of what, for us, would be a paradigm of scientific progress' and it consists in succession of ever more corroborable and better corroborated scientific theories ( $T_1, T_2, \dots, T_n$ ). Watkins asks: 'Was science fulfilling the aim of truth in this admirable progression?' and answers: 'Not with  $T_1$ , which turned out to be false, nor with  $T_2$  which suffered the same fate. Perhaps this aim was fulfilled with  $T_3$ ? Well, we may learn that it was not but we'll never learn that it was' (*ibid.*). I guess that this last Watkins's sentence unveils what his worry was really about. It was Popper's opinion that *we cannot know that our aim was fulfilled* what makes Watkins so uneasy<sup>9</sup>. But there is really *nothing* to worry about. Because, according to *PTS*, we *are able* to monitor our *failure* to achieve the truth or to get nearer to it<sup>10</sup>. Surely, there is *no room* for our knowledge that we have been (or are or will be) successful.

So *if* Watkins worried about our *inability* to monitor *the success* of achieving our aim *then* it is comprehensible enough that he longed for *positive reasons* which would *enable* us to *know* that our aim *has been fulfilled*. But, I stress, there is *no need* for such longing in *PTS*. Because *if* we refute one theory (say  $T_2$ ) *then* we show that it *cannot* be nearer to the truth than another theory (say  $T_1$ ). However, as I have already said in the footnotes 4 & 10, this nice feature of Popper's definition of verisimilitude is only due to its logical defect. So we should offer a new adequate definition of verisimili-

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<sup>9</sup> Note that a similar (if not the same) circumstance – namely our inability to connect the method of science with its success – makes Lakatos uneasy too – see his (1974, especially pp. 245 & 253-256).

<sup>10</sup> I have to admit that the latter of these abilities is only due to a logical defect of Popper's qualitative definition of verisimilitude as reported in the footnote 4 above. For this point see also (Miller 2003a, p. 5) and the following text

tude which would enable us to pronounce *falsifiable* verisimilitude-appraisals of scientific theories. If there was such a definition, *our preference for high verisimilitude would lead us to prefer a theory whose claim to be more truth-like than its competitors is untouched by refutation*. Clearly, no inductive element ‘has been let in here’<sup>11</sup> as Watkins suggests (1997, § 17).

## 9. Summary

Now I will try to sum up my point of view. Our conjecture that  $T_2$  is more truthlike than  $T_1$  is an *unjustifiable guess*. It is a *result* of our critical discussion and of our preference for high verisimilitude<sup>12</sup>. If we limit our attention to a case in which one theory  $T_1$  is refuted by some crucial observational test while the second theory  $T_2$  is corroborated by it (as Popper requires – see the citation from (Popper 1982, p. 56) stated in the section 2 above), our critical discussion (which is synthetic and which includes also our preference for high verisimilitude) will lead us to prefer  $T_2$ . But *if* we limit our attention to the corroboration-appraisals (or the results of our crucial observational tests) only, as Watkins does in his (1997), they *cannot* give us *positive* advice. As David Miller puts it: ‘All that may be derived from the empirical report that  $T_1$  is refuted and  $T_2$  is not refuted (together with a statement of our preference for truth over falsehood) is not that  $T_2$  *should be preferred to*  $T_1$  but that  $T_1$  *should not be preferred to*  $T_2$ . No attempt to justify this latter claim is made, but manifestly no justification is needed. Anyone who denies it exposes himself at once to deadly criticism’ (Miller 2002, p.13). I would like to add that if an adequate definition of verisimilitude existed, as Watkins assumes (1997, § 11), then the same would hold.

Our choice to prefer the unrefuted  $T_2$  is *reasonable* because such a theory *may be* still more truthlike than the refuted  $T_1$  although it *need not be* so. I think that it is one of several cases in which something *may be* such and such *just as it need not be* like that. And it is clear that such cases *cannot be* used as *positive* reasons<sup>13</sup> but they *can be* used very easily as *critical* reasons (in Popper’s sense). But this means that we *can believe* that  $T_2$  is more truthlike than  $T_1$  until *there is no counterexample*. Although we *cannot* justify our belief by *anything* and especially *not* by the corroboration-appraisals as Watkins suggests in his (1997, § 16), we *can defend* it by our critical reasons

<sup>11</sup> For this point see also (Miller 1994, chapter 2.2h, pp 45-46)

<sup>12</sup> See also the penultimate paragraph of David Miller’s *Foreword to the Euskara Edition* of (Popper 1972), here referred as (Miller 2003b).

<sup>13</sup> As I have tried to show in the last paragraph of the section 4 above.

(which may include the corroboration-appraisals too). For the 'fact' that the unrefuted  $T_2$  may indeed *be* more truthlike than the refuted  $T_1$  just as it *need not be* so is *no positive reason at all*.

In short, in my opinion, a more proper interpretation of the passage in which Popper talks about our 'reason to believe' (Popper 1982, p. 58) *could be* as follows:

Since there are *no* reasons against our belief (or conjecture) that the better corroborated theory is also the more truthlike one, it is reasonable to think (or we have reason to believe) that this may be so.

Or still better:

*Until there is no counterexample* to any tested conjecture, it is *reasonable* to believe that it *may be* true. And the same holds if our conjecture is that one theory is closer to the truth than all the others considered.

This interpretation is in accordance with the fact that *if* one theory ( $T_1$ ) is refuted by some crucial experiment while another one ( $T_2$ ) is corroborated by it,  $T_2$  may have *no* falsity-content (i.e. it *may be* true), thus – *according to Popper's original definition of verisimilitude* (1963, p. 233) – it *may indeed be* more truthlike than  $T_1$ . And this fact is *not* in any sense a consequence of (invalid) inductive inference.

## 10. Counterarguments to Watkins's arguments

What remains is to offer *counterarguments* to Watkins's theses stated in (1) to (5) above. The items (1) and (2) are not important for our issue. But I have to pay attention to all the remaining items. I will begin chronologically, with the item (3).

The core of this item is the question posed earlier, namely 'Why the best corroborated theory is the best theory?' Watkins thinks that Popper's answer would be: 'Because it is more truthlike than all the others considered and *we can know it*, or at least have *positive reasons* to believe in it'. But the truth is that Popper *always* emphasized that our verisimilitude-appraisal of competing hypotheses is *only a guess*. He also insisted that *we can defend* it by the help of corroboration-appraisals and other *critical reasons*. But *we cannot justify* it by them. So *if* corroboration gives us a 'reason to believe' in greater truthlikeness *then only in the sense* that if some theory (say  $T_2$ ) *has stood up* tests which another theory (say  $T_1$ ) *has failed*, we can believe that  $T_2$  is also the theory which is more truthlike because it *may be* true. Thus *we can defend*

our preference for  $T_2$  by pointing out that according to *the present state*<sup>14</sup> of our critical discussion it is the very  $T_2$  which *may be* closer to the truth than  $T_1$  and *not* the other way round. And it is *just in this way* (and presumably only in this way) the corroboration could be something like an indicator of verisimilitude. This means that *corroboration* of our *new* theory indicates that it *may be* closer to the truth than *the superseded* theory *just as* it *need not be* so. But note that Watkins persuades us of something quite different. He claims that *we can know* that one theory is more truthlike than another one and it is in *this* sense the corroboration could be an indicator of verisimilitude. In short, Watkins *transforms* Popper's *critical* reasons (offered to defend but *not* to justify) to *positive* reasons (offered to *justify*). But I have to stress again that *we cannot* (and *do not*) *know* that some hypothesis is better than another one. *Either we know* something *or not* and there really is *no* third possibility. Our *conjecture* that some hypothesis is better than another one *does not* amount to some third possibility. It amounts to our confession that *we do not know* which of competing hypotheses is the better one. So when Watkins says that 'we can know, or at least have a reason to believe' that some theory is better than another one (see (3) in the section 1 above) he *creates an illusion* that although *we cannot know* it with certainty there is a (third) possibility how *we could know it*. I have just tried to show above that *this is false*. We can scent out this Watkins's illusion at the end of his (1997, § 16) where he concludes that 'corroboration-appraisals provide some justification for the corresponding verisimilitude-appraisals'<sup>15</sup>. I have tried to show above that this is a big mistake, too.

The item (4) has been solved above, in the section 7. So I will proceed to the last item (5). I have to add only that once we see Popper's reasons as *critical reasons* (or *critical arguments*) which can be used to *defend* but *not to justify* our preference for some theory then any plea to Popper for a whiff of inductivism (such as, for example, Lakatos's – see his 1974, pp. 256 ff.) or for a whiff of justificationism will lose its force and should be seen, I suggest, as a *misinterpretation* of *PTS*. For although Popper sometimes talked about our 'good reasons' as if a justificationist tongue grew up suddenly in his mouth, he put things right by his distinction between positive and critical reasons.

<sup>14</sup> This means, of course, (as Popper informs us) that '[t]he reasonableness of a belief, in the sense described here, changes with time and cultural tradition, and to a limited extent even with the group of people who are conducting a discussion, for new argument, new critical ideas, may alter the reasonableness of a belief. It goes without saying that new experiments may do the same' (Popper 1982, p. 59)

<sup>15</sup> By the way, this is the second mistake which accompanies Watkins since his (1984, p. 281)

This point really is of a great importance. However, some philosophers constantly misread it<sup>16</sup>. That is why I join David Miller's recommendation that 'the idea of 'a good critical reason' must be handled cautiously (though preferably not at all)' (Miller 2003a, p. 5).

## 11. Conclusion

I will end by few comments on the last two Watkins's sentences of his (1997, § 20). The first was quoted above and says that '[o]nce it is accepted that justification allows of degrees, it seems clear that to justify a preference for a theory with respect to verisimilitude would tend to justify the theory itself'. The second declares that the first is a reason why 'his [Popper's] later philosophy was tainted by justificationism as well as by inductivism'. While the first sentence seems to be true, the second is *clearly false* because *Popper never tried to justify anything*. And that is why Watkins's attack on *PTS* in his (1997) is completely mistaken. He misread Popperian critical reasons as non-Popperian positive reasons. In *PTS* there is *no* such reason or rule or procedure or method (or anything else) that could *guarantee us* that we will be *successful* in our searching for the true or more-truthlike theory. According to *PTS*, *there is no known way of achieving our aim*. If there was, there would also be an inductivist or justificationist element in *PTS*. Anyway, I have already tried to show that there is *no* such element.

The irony of fate is that Watkins's own theory of science is tainted by justificationism (although not by inductivism) and Watkins seems to be aware of it. For in (1997, § 23) he writes about his own position that 'it justifies a preference for the better corroborated  $T_2$  over  $T_1$  on the ground that  $T_2$  is better than  $T_1$  with respect to the optimum aim of science, where the latter does not require the thus preferred theories to be certainly true, or in some sense probably true, but only possibly true in the old Popperian sense of having been severely tested and surviving so far'. And in his earlier (1984, p. 279) he stressed that *we can know* (in the traditional sense) that the preferred theory is also the best one of all the competing theories. But the truth is that *we cannot know it*. Corroboration *qua* justification 'makes not a jot of difference to the status of any hypothesis' (Miller 1994, p. 7)<sup>17</sup>. Thus *we cannot know* that the best corroborated theory is the best of all the competing theories in the field of our inquiry. At best, we can only *conjecture* that this is

<sup>16</sup> See for example David Miller's comments on one such philosopher (Schurz) in his (2002, p. 13).

<sup>17</sup> As we have seen in the section 4 above (see the text to the footnote 4)

so and *defend* (or *challenge*) our conjecture by some *critical arguments* (i.e. by other *conjectures*).

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