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**RESEARCH ARTICLE**

## **2+2 = 4 and 2+2 = 5 in George Orwell's 1984: A Reader-Response Analysis**

**Mabandine DJAGRI TEMOUKALE<sup>1</sup> ✉ and Nouhoun AMADOU<sup>2</sup>**

<sup>1</sup>Department of Anglophone Studies, University of Kara, Togo

<sup>2</sup>Department of Philosophy, University of Kara, Togo

**Corresponding Author:** Mabandine DJAGRI TEMOUKALE, **E-mail:** [josiasdjagri@yahoo.fr](mailto:josiasdjagri@yahoo.fr)

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**ABSTRACT**

In *1984*, George Orwell puts in competition two propositions, logical ( $2+2 = 4$ ) and dialectical ( $2+2 = 5$ ), leaving the choice to the readers to appreciate and choose the better one, the one from which solutions to the challenges in the imaginary society of Oceania emerge. It is in this conflicting context that this paper attempts, through reception theory, to show that beyond Winston's logic,  $2+2$  equals 4 may not only represent a dogmatization of scientific reasoning but also fixed thinking. The paper argues that  $2+2 = 5$ , in a dialectical perspective, is more illustrative of scientific thinking that is nourished by dynamism and curiosity. It denounces the abuse of the principle of relativism as presented in the novel, calling for a relativism that is not pessimistic but optimistic.

**KEYWORDS**

Objectivity, fixed thinking, dynamic thinking, dogmatization

**Abstract (French)**

Dans *1984*, George Orwell met en concurrence deux propositions, logique ( $2+2 = 4$ ) et dialectique ( $2+2 = 5$ ), laissant le choix aux lecteurs d'apprécier et d'en choisir la meilleure, celle de laquelle sortent des solutions aux défis dans la société imaginaire d'Océanie. C'est dans ce contexte conflictuel que cet article tente, à travers la théorie de la réception, de montrer qu'au delà de la logique de Winston, l'opération  $2+2$  égale à 4 peut représenter non seulement une dogmatisation du raisonnement scientifique mais aussi une pensée figée. L'article soutient que  $2+2 = 5$ , dans une perspective dialectique est plus illustratif de la pensée scientifique qui se nourrit du dynamisme et de la curiosité. Il dénonce l'abus du principe du relativisme comme présenté dans le roman, en appelant à un relativisme non pas pessimiste mais optimiste.

Mots-clés : objectivité, pensée figée, pensée dynamique, dogmatisation

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### **1. Introduction**

Both fixed and dynamic thinking are depicted in George Orwell's *1984* through the dialogue between Winston Smith, a civil servant whose main task is to review newspapers and other state documents in order to destroy information harmful to social stability, and O'Brien, a senior civil servant and one of the masterminds of the ruling party responsible for unmasking and converting opponents of Big Brother's leadership in Oceania, the fictional state. In contrast to logical thinking driven by the validation of certainties and finitude inspired by numbers, Big Brother's single party proposes a model for managing society where numbers, especially integers, are variable and dynamic. Therefore, according to O'Brien, the calculation  $2+2$  can yield 4, 5, 3 or 1. This proposition stands in binary opposition to the Cartesian logic and mindset embodied by Winston Smith that allows  $2+2$  equals 4 ( $2+2 = 4$ ) to be accepted as a scientific and universally true proposition.

Indeed, dialectics and logic (Keiff, 2010; Krol, 2015) are invited into George Orwell's literary creation from certainties and

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contradictions. These two forms of reasoning raise the following questions: How can one justify that  $2+2$  can be equal to  $\pm 4$ , as long as the finitude of the absolute value of 2 ( $|2|$ ) is proven in mathematics? How can one maintain an absolutist position according to which  $2+2$  is equal to 4 without being blinded by certainties that freeze scientific curiosity? From these questions, the two competing positions (dialectic and logic) manifested in  $2+2 = 4$  and  $2+2 = 5$  emerge.

Thus, dialectical thinking (Cherlonneix, 2015; Hurand, 2006; Demelemestre, 2016; (Beaudoin, 2018; Arens, 2015; Jobert, 2004) which welcomes contradiction in a progressive and dynamic perspective is illustrated through  $2+2 = 5$ , while logic ( $2+2 = 4$ ) which is concerned with conformity with norms and modes of reasoning translates into the exclusion of all fantasy and relativity. At this level, Winston is certain that the Cartesian mind (Rabouin, 2016; Dubouclez, 2016; Ghisalberti, 2005) is the only thing indispensable for the liberation of the masses from the dictatorship of Big Brother in Oceania.

However, it is in this conflicting context that this paper attempts, through a Reader-Response Approach, to show that beyond Winston's logic,  $2+2$  equals 4 may represent not only a dogmatization of scientific reasoning but also fixed thinking. The paper argues that  $2+2 = 5$ , in a dialectical perspective, is more illustrative of scientific thinking that is nourished by dynamism and curiosity. It denounces the abuse of the principle of relativism as presented in the novel, calling for a relativism that is not pessimistic but optimistic.

Reader-response approach to literature lays emphasis on the role of the reader or audience in the creation of meaning while reading a work of art. Its leading figures are the German literary theorists Wolfgang Iser (1926-2007) and Hans Robert Jauss (1921-1997). Iser showed that a literary text is subjected to multiple interpretations as each reader brings in their experience and background to make meaning (Iser, 2006). His famous books, *The Implied Reader* (1972) and *The Act of Reading* (1976) are illustrative of the relationship between a text and a reader. A reader-response criticism of *1984* by George Orwell offers an opportunity to interpret  $2+2 = 4$  (two plus two equals four) and  $2+2 = 5$  (two plus two equals five). The fact of bringing such mathematic aspects in a creative work gives the reader potential meanings as they commit themselves to the reading. Thus, the paper first deals with  $2+2 = 5$  as a representation of relativism. It then shows how  $2+2 = 5$  is an abuse of relativism as it challenges objectivity to serve a corrupt political regime like that of Big Brother in *1984*. The paper concludes by arguing that  $2+2 = 5$  is, to some extent, illustrative of dynamic thinking which gives room for debates as it welcomes what is new or strange.

## **2. Relativism through the Calculation $2+2 = 5$ in *1984***

The operation  $2+2 = 5$  in *1984* stems from the principle of relativity, which allows for a questioning of mathematical truths deemed universal (Rabouin, 2009; Angelini, 2006). Indeed, we note here a close and curious concordance between Orwell's position and that of the philosophers of the New Academy (III<sup>e</sup> -I<sup>er</sup> century BC), a school close to scepticism (Vidal- Rosset, 2016). Absolute certainty being inadmissible, the leader Arcésilas proposed to base human behaviour on merely reasonable opinions (*euloga*); and Carneades added that one thesis can be judged more probable (*pithanon*) than another (Lévy, 2016). Here then, once again and with nuances that need to be clarified, Orwell is in the neighbourhood of scepticism.

This undeniable proximity of Orwell's epistemology to important aspects of Greek scepticism, its probabilistic variant, and also to the thinking of David Hume (1711-1776), that 'master of suspicion' before his time, gave rise to a question that Karl Popper (1902-1994) had to answer in order to avoid any misunderstanding, any misinterpretation of thought: Does the fallibility of scientific knowledge lead to pessimistic scepticism? Popper (1973) frankly admits that he takes his side of this incompleteness of knowledge: "I do not demand from science any definitive certainty" (p.78); he goes further to say: "there can be no ultimate statements in science (...), which cannot be subjected to tests and therefore cannot in principle be refuted by the falsification of some of the conclusions that can be deduced from them (Popper, 1973, p.44). Following the positions of Orwell and Popper; are they sceptical? They certainly are, if we are willing, beyond the misunderstandings and prejudices that surround this word, to take the trouble to restore its original and even Socratic meaning of *examiner*, *observer*, *scrutinizer*, by taking seriously the synonymy established by Sextus Empiricus between this term and the adjective *zetetikos* (researcher).

Pessimists, on the other hand, is a term that does not define Popper and Orwell. They, therefore, have an optimistic, dynamic and even hopeful conception, consisting in admitting the possibility of knowledge and its progress, without attributing to it the character of definitive certainty. Open, evoking a pilgrimage never completed here on earth, the very image of the human condition, at the antipodes of sclerotic dogmatism and stale scientism. This beautiful text by Popper (1973) bears witness to this:

Science does not rest on a rocky foundation. The bold structure of its theories is built, as it were, on a swamp. It is like a building on stilts. The stilts are driven into the swamp but not to the point of meeting some natural or 'given' base, and when we stop trying to drive them in further, it is not because we have reached firm ground. We stop, simply, because we are convinced that they are strong enough to withstand the challenge, at least temporarily (p.111).

Contradicting this scientific consensus, Orwell shows that the lack of relativity ( $2+2 = \pm 4$ ) in the state of Oceania ruled by the dictator Big Brother in 1984 can lead to immobility and intellectual stiffness or rigidity. He illustrates this view through the character of Winston. To challenge this, Orwell uses the Big Brother regime to question and challenge the universality that Winston supports. Thus, although the manipulation of the past and the defiance of 'two plus two equals four' ( $2+2 = 4$ ) are the ploys of a corrupt regime, the ability to use any means to prove and accept that 'two plus two ( $2+2$ ) can yield a result different from four (4), is still beneficial to open-mindedness.

Indeed, by combating the single-mindedness of the calculation "two plus two equals four" ( $2+2 = 4$ ), George Orwell not only denounces and exposes the dictatorship of capitalist societies and the abuses of power of totalitarian regimes but also empowers the masses to challenge the dominant discourses in both. Thus, Winston in 1984 could be indignant if the Big Brother party refused to accept any other understanding or interpretation of the operation 'two plus two equals four' ( $2+2 = 4$ ). It can be noted, however, that the dynamism that the Big Brother regime seeks is not a flexibility that frees from indoctrination. Relativity becomes a strategy of the ruling party to allow itself all abuses. As such, all truths are open to reinterpretation, making the party of Big Brother the approved laboratory in the production of knowledge appropriate for the maintenance of the dictatorship. When the majority accepts the relativity offered by the party, they end up with a conscience that hopes that all abuse is also temporary and relative. Citizens in Oceania as described by George Orwell can therefore develop resilience to the difficulties they face in the expectation of a better life. It is this danger that Winston sees when he maintains that two plus two ( $2+2$ ) can only be four (4).

However, does relativism in politics necessarily mean manipulation of opinion or dictatorship of the ruling party? While it is true that to a certain extent, the politician can surf on the principle of relativism to manipulate the population to retain power, it is also true that the very essence of relativism in the functioning of a state can sometimes take on the dimension of this relativism that Paul Feyerabend (1924-1994) designates as "*practical relativism*" (Gens, 1996). Indeed, practical relativism is fundamentally concerned with how different concepts, customs and traditions can influence or even affect lives. How to manage political affairs in a State where the population is more or less homogeneous with the simultaneous existence of classes, which aspire to live together if the politician does not take into account this relativistic dimension to achieve a better coexistence? Some can indeed say that the law alone allows for subjugating the entire population because it is general and impersonal (Cantele, 2022). But can the law alone harmonise a composite society? It is in this sense that the politician manages to exploit the principle of relativism, as described in 1984, to allow the different social strata to have shared experiences and values. Unfortunately, in 1984, relativism is used not for the sake of social stability for the good of the people but for safeguarding Big Brother's dictatorship.

### 3. Objectivity, Relativism ( $2+2 = 5$ ) and Corruption in 1984

Mathematicians would not be in their comfort zone if they had to admit today that  $2+2$  equals 5, since the operation they know to be right, correct and logical is  $2+2$  equals 4. According to Dortier (2014, p. 1), "Mathematics offers a good model of this view of knowledge since mathematical truths ( $2+2 = 4$ , the theorems of Thales and Pythagoras) are *absolutely true*, at all times and in all places". Winston's indignation at O'Brien is, therefore, to be expected as  $2+2 = 4$  is agreed, accepted, validated, 'absolutely true and used as a logical calculation in mathematical transactions and, more importantly, many other formulae and calculations depend heavily on it (de Buzon, 2005). Therefore, for one to accept that  $2+2$  makes 5, one needs a disposition and an open mind. For Winston, nothing is truer than  $2+2 = 4$ . He sees this operation as an unalterable or incorruptible reality based on the principle of scientific objectivity.

What then is this scientific objectivity? If we go back to the logical positivists (Brenner, 2011), we can really get a clear and precise idea of the concept of objectivity. Clearly impressed by the prowess of physics just after the Second World War, the logical positivists swore that only science is objective. The friends of the Vienna Circle tried to reduce science to a model that they chose, with their aim to unify science, under the banner of physics (Boyer, 1995). For the logical positivists, physics was the basic science to which other sciences (chemistry, biology, psychology, economics, sociology and even history) would sooner or later be reduced. Such was the content of their belief in "physicalism".

As for the progress of physics, the logical positivists proceeded from a stable observational basis towards a cumulative increase of ever more general laws. This attempt to model unified science failed. The Vienna Circle philosophy states that valid and true knowledge is reduced to scientific knowledge alone. Science is understood as the only knowledge consisting of statements whose truth depends on their meaning and verifiability. Logical positivists support check semantics because the meaning of a proposition consists of the method of its empirical verification. This is the way in which one decides whether the proposition is true or false. This leads to the overestimation of the empirical sciences. As a result, all sciences are reduced to these empirical sciences. Hence the challenge to the logical positivists' approach to scientific objectivity by Karl Popper, who rather think that it is impossible to verify in all cases.

Indeed, no observation can corroborate a scientific theory by accumulating evidence that would confirm it or by resorting to

induction (Tricard, 2020). No law can guarantee that the generalisation drawn from repeated true observations is true. Popper wondered whether a theory, a general statement, can be justified by 'empirical reasons', i.e., by observations or by experiments that are recognised as conclusive. The answer is: "No, however many verifications of a statement there may be, they cannot justify the claim that the universal explanatory theory is correct" (Popper, 1972, p.17). This is tantamount to arguing that universal statements cannot be rigorously inferred from singular statements, or that "scientific theories can never be completely justified" (Popper, 1973, p.41). Scientific objectivity, which was based on the criterion of empirical verifiability, has thus been called into question. Scientific truth is no longer absolute. Rather, it is provisional, subject to questioning. Even mathematical postulates and theorems are not based on any scientific certainty. It is therefore necessary to understand the logic that some people use to assert that 2+2 can give 5 or 3. As O'Brien notes in *1984*: "Sometimes they make five" (1984, p.256), i.e., 2+2=5.

However, 2+2 = 5 is a picture of corruption. It refers to illegal acts and practices, that which is far from the norm, that which is immoral, or the negation of what is commonly believed to be true, good and valid. So far, the calculation 2+2 = 5 proposed by Big Brother and his party is deemed by George Orwell and his antagonist character to be unfit for commonly accepted mathematical formulae. In binary opposition to 2+2 = 5, 2+2 = 4 represents what is considered legal, true, logical, normal, and commonly known and accepted, generally used for calculations. Therefore, 2+2 = 5 is a corrupt mathematical operation, a deviation from the truth and what is correct. It fully represents corruption in its various forms in the society described by George Orwell.

In other words, Big Brother's totalitarianism is an illustration of the moral rot and mental decay of leaders like O'Brien. This decadence is the consequence of the distance from the result that 2+2 gives. Because of one more point added to the value of 4, the regime needs to resort to propaganda and, in the worst case, torture to make people admit that 2+2 equals 5. Thus, for Winston, if the variable X is to represent the result of the sum of 2+2, its absolute value must be equal to 4. Unfortunately for him, O'Brien who represents the leading party goes further to claim that 2+2 can also be equal to 3 or 1. We agree with O'Brien that the value  $X = 4$  represents a variable with an absolute value of 2 equal to 2 ( $|2|=2$ ). This means that 2+2 = 4 can be put into an equation with one unknown X with the absolute value of X equal to plus or minus four ( $|X| = \pm 4$ ), which cannot be admitted according to Winston's reasoning. Unfortunately, it is in this mathematical trickery that O'Brien says: "Sometimes, Winston, 'Sometimes they are five. Sometimes they are three. Sometimes they are all at once'" (1984, p.256). Dictatorship thus triumphs over all things in Orwell's literary creation using all means including numbers. The calculation 2+2 = 5 does not do justice to the citizens of Oceania and is therefore corrupted.

#### **4. Dynamic Thinking in 1984**

Beyond the mathematical logic of 2+2 = 4, it is crucial to consider the dynamics of 2+2 = 5 or 2+2 =  $\pm 4$ . In O'Brien's operation, the result can be more or less equal to the sum of the elements of the whole. Far from being taken as a pure fabrication in the image of the regime's propaganda, 2+2 = 5 or 2+2 =  $\pm 4$  should lead Winston to a mental exercise to feed his intellectual curiosity.

Scientific truth is a lie in abeyance since it is characterised by progress and a permanent questioning of already established truths (Popper, 1972; Ritchie, 2020). It cannot be excluded, depending on the posture of Big Brother's party, that 2+2 = 5 or 2+2 =  $\pm 4$  is also true. Maintaining that 2+2 is equal to 4, even with the absolute value of 2 equal to 2, may also be a belief in absolute truth from a scientific perspective. This rigidity imprinted on Winston's system of thinking may be of paramount importance to him in the world of numbers, but it removes his ability to be flexible when the actualisation of mathematical truths would require taking into account the existence of 2+2 = 5 or 2+2 =  $\pm 4$ .

If the reality of O'Brien's world is at odds with the numbers, one can expect two things to happen: either the numbers are altered, or the reality is altered. As a result, the probability of reality changing in favour of the numbers is less than the probability of the numbers changing in favour of reality. Thus, the party of Big Brother believes it is necessary for the management of the affairs of the city in which Winston lives to influence the numbers that validate scientific truths.

We can draw a parallel here by reviving the traditional debate between realism and idealism. The first thesis asserts the objective existence of the world, and the second only attributes a subjective reality to things, the world being only a product of our thinking (Deshays, 2008). Both points of view are equally unprovable. They are therefore equally irrefutable since only the truth of one would lead to the falsity of the other. Sensory experience proves nothing about the reality of objects as a tradition that goes back to Descartes, Berkeley and Hume has shown, following the Greek sceptics (Deshays, 2008; Devillairs, 2017). Here, we are in the presence of a form of Kantian antinomy, an insoluble aporia: do subjective idealism and realism make a draw? This is not precisely the case according to Karl Popper who believes that the two opposing points of view, however untestable they may be, can be the subject of a rational discussion, of an argument which, without leading to a decisive conclusion, gives 'overwhelming weight' to the realist thesis and makes it preferable to the idealist one: "In this case, as in others, there can be no conclusive argument. But there are arguments in favour of realism; or rather, against realism" (Popper, 1972, p.50). Following the Popperian

terminology, one could say that, in this metaphysical debate, realism is rationally supportable and idealism rationally criticisable.

Winston's stubbornness and determination to prove that  $2+2$  equals 4 is the only true operation shows a dogmatism of numbers. Thus, the danger for science is the transformation of numbers into absolutely true and reliable values even though the realities that these numbers reflect require other interpretations. Therefore, convincing the world of this infallibility status translated into the operation  $2+2$  equals 4 is one of the many temptations to manipulate data, statistics and figures to reflect tangible reality when one fails to convince with figures or pre-established formula. This dogmatism imposed by the world of numbers has made almost all the sciences inflexible, and even literary scholars are tempted to put numbers to their analyses in order to sound scientific. Thus, the knowledge that  $2+2$  equals 5 is denied access not because it does not exist or is not true, but for fear of disturbing the belief in numbers (silencing any heresy or dissenting voice).

Indeed, Covid-19 (Boniface, 2020) has shown how often the belief in  $2+2$  equals 4 (like Winston does) has challenged the values and characteristics that define the scientific process and mind. Probability has been transformed into objectivity through the manipulation of numbers (Ritchie, 2020; Berenson, 2021) in order to maintain the belief that  $2+2$  is equal to 4. The refusal to debate  $2+2$  equals 5 as O'Brien wishes in *1984*, shows how  $2+2$  equals 4 not only constructs fixed mindsets but also manufactures disciples or apostles of Scientology (Lamote, 2010; Lamote & Arthur, 2010) or scientism (Spoljar, 2014). This belief is legitimised through the manipulation of figures or statistics to serve the discourse or ideology that feeds the scientific faith.

Scientific research in a society such as Winston's is reduced to a formality, since the results from the field do not have to challenge the agenda of those who hold political and economic power. This opens the door to pre-paid research results (Ritchie, 2020; Berenson, 2021) such as  $2+2$  equals 4. Although in the context of *1984*, the result of the sum of two plus two must vary according to the needs and dominant discourse of Big Brother's party, the calculation  $2+2 = 5$ , far from being an anomaly or error, prepares the human mind to welcome the unknown, the uncertain. It can be the reality on the ground that defies the established norms.

## 5. Conclusion

After having shown the existence of two worlds: the world of absolute truths (the preserve of scientific knowledge) and the world of relative truths (relativism), it has been noted that, for some, scientific knowledge based on the principle of objectivity is the only way to achieve scientific knowledge. It is the reign of scientism where everything is based on mathematical figures and equations that are thought to be infallible. For others, the world is so complex that it is an illusion to believe that everything is based on the principle of rationality. In other words, scientific truths are not as rational as they are made out to be; hence the doubt that arises, calling for not pessimistic but optimistic relativism. It can therefore be argued that the rationalist theories according to which events lead to an event and all societies to a single society are in reality only ideologies. From Comte's contention that the history of humanity should be constructed as that of a single people to the announcements and glorifications of multiple "civilisations of the universal", the world remains threatened by continual false universalisations. Theories of diversity and equality of opinion are the necessary bulwarks to protect citizens in *1984* from scientific dogmatism, which is considered, rightly or wrongly, to be the only universal line of evolution.

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