Logic and Logical Philosophy
Volume 27 (2018), 205–233
DOI: 10.12775/LLP.2017.030

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IN DEFENCE OF DIALETHEISM
A Reply to Beziau and Tkaczyk

Abstract. In recent editions of this journal, Jean-Yves Beziau [8] and Marcin Tkaczyk [42] have criticised a prominent dialetheic logic and common arguments for dialetheism, respectively. While Beziau argues that Priest's logic **LP** commits the dialetheist to trivialism, the thesis that all propositions are true, Tkaczyk maintains that the arguments traditionally proposed for dialetheism are faulty and ultimately that dialetheism should be rejected as self-refuting. This paper shows that both are mistaken in their contentions. Beziau's argument conflates *truth-in-an-interpretation* with truth *simpliciter* and Tkaczyk misconstrues the substance of dialetheic arguments. In the process of identifying these weaknesses of both arguments, the paper clarifies elements of both dialetheic logics and dialetheism which these discussions demonstrate are still misunderstood within the literature.

Keywords: dialetheism, paraconsistent logics, logic of paradox, self-referential paradoxes

1. Dialetheism

Two definitions of dialetheism are often proposed within the literature, sometimes within the same paragraph (see [2, p. 114], [33, p. 1], [43, p. 419]):

Definition 1 ([25, p. 266], [30, p. 4], [41, p. 355]).
Dialetheism is the thesis that some contradictions are true.

Definition 2 ([4, p. 270], [5, p. vii], [28, p. 336]).
Dialetheism is the thesis that some truthbearers (conceived in terms of sentences, propositions, or however you wish) are *both* true *and* false.

Received August 24, 2016. *Revised* September 28, 2017. *Published online* October 3, 2017

Fortunately, the prominence of these two definitions is harmless as modern dialetheists commit themselves to two additional theses which, in conjunction, entail their equivalence:

(Di) Contradictions are propositions of the form $A \wedge \neg A$ (see [6, p. 517] and [33, p. 1]).

(Dii) The Boolean connectives have their normal meaning (see [34, p. 13] and [36]).[1]

For paucity, we leave the simple proof of the result to the reader:

Lemma 1. *Definitions* 1 *and* 2 *are equivalent given the above assumptions* (Di) *and* (Dii).

The result of this lemma is that we can harmlessly interchangeably use definitions 1 and 2 to characterize dialetheism.

While it's been proposed that true contradictions can be derived from the concept of change and obligations [34, Chs. 11 and 13], the strongest motivation for dialetheism recognised in the philosophical literature to date comes from the self-referential logico-semantic paradoxes. According to dialetheists these paradoxes have evaded successful non-dialetheic solutions not through a lack of effort or rigour on the logician's part, but due to an inherent flaw that all non-dialetheic solutions share [34, Chs. 1–2].

Take as an example the strengthened liar,

(λ) λ is not true.

According to Tarski [39, pp. 348–349], liar paradoxes are a consequence of four conditions holding in a language L:

(T1) That any sentence s in L can be named by a term t belonging to L.

(T2) That L has the resources to express its own semantics (e.g., in English we can express 'Sentence s is true').

(T3) The T-schema ('s is true' iff s) is universally applicable to the truth-predicate in L.

(T4) The 'ordinary', i.e., classical, laws of logic hold in L.[2]

[1] That is: conjunction: $v(A \wedge B) = \min\{v(A), v(B)\}$; disjunction: $v(A \vee B) = \max\{v(A), v(B)\}$; negation: $v(\neg A) = 1 - v(A)$.

[2] The inclusion of (T4) has caused some confusion in interpretations of Tarski's position regarding the Liar. For example, Hugly and Sayward [16] incorrectly interpret

Conditions (T1) and (T2) are known as the *semantic closure* of a language, and it was Tarski's view that natural languages are inherently semantically closed:

> A characteristic feature of colloquial language (in contrast to various scientific languages) is its universality. It would not be in harmony with the spirit of this language if in some other language a word occurred which could not be translated into it [...]. If we are to maintain this universality of everyday language in connexion with semantic investigations, we must, to be consistent, admit into the language, in addition to its sentences and other expressions, also the names of these sentences and expressions, and sentences containing these names, as well as such semantic expressions as 'true sentence', 'name', 'denote', etc. But it is presumably just this universality of everyday language which is the primary source of all semantic antinomies. [40, pp. 164–165]

According to Tarski's diagnosis, a natural language L will contain true contradictions as long as (i) L is semantically closed, and (ii) the T-schema is valid for all applications of the truth predicate in L. So, if one wished to resolve the Liar paradox without rejecting (T4), one must somehow restrict the semantic closure of natural languages or the applicability of the T-schema in those languages.

According to the dialetheist, all such attempts to reject either semantic closure or (T3) for a natural language L by restricting L's expressive power involve *ad hoc* manoeuvres or are susceptible to revenge paradoxes [34, Ch. 1]. In other words, non-dialetheic solutions to the liar are essentially flawed. The only available solution to the paradox, therefore, is to reject (T4), and particularly the classical tenets that no propositions can be both true and false, and that no contradiction can be true. Consequently, the dialetheist resolves the paradox by accepting its conclusion, requiring her to reject several tenets of classical logic and admit that the conclusion is a true contradiction. As such, dialetheism offers a novel solution to paradoxes — admit their soundness [2].

Tarski as attempting to demonstrate that natural languages include true contradictions, and criticise his (putative) argument for failing to recognise that the inclusion of (T4) ensures that a true contradiction can not be validly deduced. Indeed, the inclusion of (T4) demonstrates that the Liar is a *reductio* of the joint truth of (T1)–(T3). For the more plausible interpretation that Tarski used the Liar to demonstrate that (T1)–(T3) were inconsistent with classical logic see [15] and [37]. Given this interpretation, the important question for Tarski is then which of (T1)–(T3) should go, given that the validity of classical logic is indisputable; see Tarski [39, p. 349]. Ray [37] interprets Tarski as rejecting (T3), the applicability of the T-schema to the Liar.

2. Dialetheic logics

With this new solution to the paradoxes comes the need for a new logic. Firstly, the dialetheist requires her logic to assign contradictions the truth-value *true* which, given her assumptions (Di) and (Dii), additionally requires her logic to be able to assign both truth-values to propositional parameters in an interpretation (this follows trivially from Lemma 1). Neither of which classical logic permits.

Secondly, to avoid trivialism,

Definition 3 ([20]).
Trivialism is the thesis that all propositions are true,

which dialetheists generally wish to [32], the dialetheist requires a logic that can accommodate true contradictions without entailing every proposition. In other words, she requires a strongly paraconsistent dialetheic logic.

Let us begin with some definitions:

Definition 4. A logic $\mathcal{L}$ is *paraconsistent* iff for some formulae of the form A and B, $\{A, \neg A\} \not\models_{\mathcal{L}} B$.

Definition 5. A logic $\mathcal{L}$ is *strongly* paraconsistent iff for some formulae of the form A and B, $\{A \wedge \neg A\} \not\models_{\mathcal{L}} B$.

If a logic $\mathcal{L}$ is *not* paraconsistent, that is for every formulae of the form A and B, $\{A, \neg A\} \models_{\mathcal{L}} B$, we shall say that it is *explosive*. Similarly, if a logic $\mathcal{L}$ fails to be strongly paraconsistent, so that for every formulae of the form A and B, $\{A \wedge \neg A\} \models_{\mathcal{L}} B$, we shall say that it is *strongly explosive*.

Definition 6. A logic $\mathcal{L}$ is *dialetheic* iff $\mathcal{L}$ permits contradictions, formally conceived as formulae of the form $A \wedge \neg A$, to be assigned *at least* the truth-value true in an interpretation. (Thus, the definition does not preclude contradictions from *also being false*.)

Some simple consequences follow from these definitions. Firstly, some paraconsistent logics are strongly paraconsistent, and others are not. For example, while Jennings and Schotch's [19] preservationist logic is paraconsistent, it fails to be *strongly* paraconsistent. Secondly, not all paraconsistent logics are dialetheic logics. Again, Jennings and Schotch's [19] preservationist logic fails to be dialetheic. Consequently, as the dialetheist, for obvious reasons, requires a dialetheic logic, not just any paraconsistent logic will be suitable for her purposes. Thirdly, it follows from definitions 5 and 6 that if a *dialetheic* logic is to be non-trivial, it must also be *strongly* paraconsistent. For, if a dialetheic logic were *strongly explosive*, such that for every formulae of the form A and B, $\{A \wedge \neg A\} \models_{\mathcal{L}} B$, then the truth of some formulae of the form $A \wedge \neg A$ would entail every formula, and thus the logic would be trivial (by Definition 3).[3] Consequently, given that the dialetheist requires a *dialetheic* logic, and does not wish to be committed to trivialism, she additionally requires a *strongly* paraconsistent logic. Famous examples of such strongly paraconsistent dialetheic logics are Priest's [29] **LP** and da Costa's [11] $\mathbf{C}_i$ $(1 \leqslant i \leqslant \omega)$ family of logics.

So far, we've shown that the dialetheist requires a zero-order logic $\mathcal{L}$ that fulfils at least two conditions: (1) $\mathcal{L}$ is strongly paraconsistent and (2) $\mathcal{L}$ is dialetheic. However, once we reintroduce the dialetheist's background assumption (Dii), we can introduce a third condition: (3) $\mathcal{L}$ respects the normal semantics for the Boolean connectives.

While conditions (1) and (2) preclude the dialetheist from using both classical logic and Jennings and Schotch's [19] preservationist logic to model her theory, condition (2) precludes the adequacy of Brown's [9, 10] preservationist logic for her purposes. Additionally, the final condition (3) has led to the dialetheist being wary of using da Costa's [11] $\mathbf{C}_i$ $(1 \leqslant i \leqslant \omega)$ family of logics, as they assign non-normal semantics to negation [36].

The classic example of a non-trivial dialetheic logic which fulfils all of these conditions is Priest's [29] *Logic of Paradox* (**LP**).[4] **LP**'s semantics can be presented, as Beziau [8, p. 52] does, in terms of Kleene's [21, p. 334] strong matrices, with the intermediate value $\frac{1}{2}$ interpreted as *both* true *and* false; see Table 1.

However, for philosophical reasons, the logic's semantics are now often conceived in terms of valuation relations (see [30] and [34, Ch. 19]), as with Dunn's [12] four-valued semantics for Anderson and Belnap's [1]

[3] It's worth noting that although the only *dialetheic* logics of any use are *strongly* paraconsistent, the inverse does not hold. There are interesting *strongly* paraconsistent logics which are not *dialetheic*. See, for example, Brown's [9, 10] strongly paraconsistent preservationist logic in which measures of ambiguity are preserved through the consequence relation.

[4] Also known as Asenjo's [3] *Calculus of Antinomies*.

	$\neg$
0	1
$\frac{1}{2}$	$\frac{1}{2}$
1	0

$\wedge$	0	$\frac{1}{2}$	1
0	0	0	0
$\frac{1}{2}$	0	$\frac{1}{2}$	$\frac{1}{2}$
1	0	$\frac{1}{2}$	1

$\vee$	0	$\frac{1}{2}$	1
0	0	$\frac{1}{2}$	1
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1
1	1	1	1

Table 1. **LP**'s semantics

First-Degree Entailment (**FDE**).[5] Conceived in these terms, valuations of propositional parameters in **LP** are relations ε between the parameters and the set of truth-values $\{1, 0\}$, with each parameter taking *at least one* truth-value. Thus, propositional parameters may be assigned the truth-value *true*, *false* or *both* true *and* false together in an interpretation. The Boolean connectives are given their normal semantics:

$$\begin{aligned}
(A \wedge B)\,\varepsilon\,1 &\quad \text{iff} \quad A\,\varepsilon\,1 \text{ and } B\,\varepsilon\,1\\
(A \wedge B)\,\varepsilon\,0 &\quad \text{iff} \quad A\,\varepsilon\,0 \text{ or } B\,\varepsilon\,0\\
(A \vee B)\,\varepsilon\,1 &\quad \text{iff} \quad A\,\varepsilon\,1 \text{ or } B\,\varepsilon\,1\\
(A \vee B)\,\varepsilon\,0 &\quad \text{iff} \quad A\,\varepsilon\,0 \text{ and } B\,\varepsilon\,0\\
(\neg A)\,\varepsilon\,1 &\quad \text{iff} \quad A\,\varepsilon\,0\\
(\neg A)\,\varepsilon\,0 &\quad \text{iff} \quad A\,\varepsilon\,1
\end{aligned}$$

As usual, the material conditional $(A \to B)$ is defined as $(\neg A \vee B)$.

By introducing **LP**'s consequence relation,

$$\Sigma \models_{\mathbf{LP}} B \quad \text{iff for any } \varepsilon, \text{ if } \forall A \in \Sigma,\ A\,\varepsilon\,1, \text{ then } B\,\varepsilon\,1,$$

we can show that **LP** fulfils all the three conditions that the dialetheist requires from a zero-order logic, in addition to being paraconsistent.

[5] The philosophical reasons for using a relational semantics for **LP** are at least two-fold. Firstly, it avoids any temptation to interpret the intermediate value $\frac{1}{2}$ in the matrices as a mysterious third truth-value. The relational semantics make explicit that, rather than postulating a third truth-value, the dialetheist is simply proposing that the set of true propositions and the set of false propositions intersect — some propositions just happen to be *both* true *and* false. Secondly, using a relational semantics allows the dialetheist to avoid certain revenge paradoxes that would undermine her attempt to provide a comprehensive dialetheic solution to the self-referential paradoxes [31].

LEMMA 2. **LP** *is* (i) *paraconsistent,* (ii) *strongly paraconsistent,* (iii) *dialetheic, and* (iv) *respects the the normal semantics for the Boolean connectives.*

PROOF. Condition (iv) is met trivially by the truth-conditions of the connectives given above. Condition (iii) is met by the fact that there are permitted valuations in **LP** such that a formula A is assigned both truth and falsity, $A \varepsilon 1$ and $A \varepsilon 0$, respectively. Now, given the meaning of negation in **LP**, $\neg A$ takes both truth-values if A does. Thus, as both A and $\neg A$ can be true in an interpretation, as well as false, their conjunction can be true in this interpretation, as well as being false. Therefore, it's possible for contradictions to be assigned the truth-value true in **LP**. The satisfaction of (i) and (ii) are ensured by **LP**'s consequence relation and the satisfaction of (iii). Given that formulae of the form A and $\neg A$ can both be assigned the truth-values true and false in an interpretation in **LP**, and thus the contradiction $A \wedge \neg A$ can be assigned both truth-values, there will be interpretations in which both $\{A, \neg, A\} \not\models_{\mathbf{LP}} B$ and $\{A \wedge \ \neg A\} \not\models_{\mathbf{LP}} B$. Consider an interpretation in which $A \varepsilon 1$ and $A \varepsilon 0$, and $B \varepsilon 0$. In this case, both A and $\neg A$ will be assigned truth and falsity, given the meaning of negation in **LP**, while B is only assigned the truth-value false. Therefore, $\{A, \neg A\} \not\models_{\mathbf{LP}} B$. Similarly, given that $\{A \wedge \neg A\} \varepsilon 1$ and $\{A \wedge \ \neg A\} \varepsilon 0$, while B is only assigned the truth-value false, we also have $\{A \wedge \ \neg A\} \not\models_{\mathbf{LP}} B$. □

Due to its consequence relation and the semantics it supplies the Boolean connectives, an interesting feature of **LP** is that it upholds all of the logical truths of classical propositional logic [34, 80], including the law of non-contradiction (**LNC**), $\neg(A \wedge \neg A)$. While formulae of the form $A \wedge \neg A$ can be true in an interpretation in **LP**, they are also false in *every* interpretation. Consequently, given the meaning of negation in **LP**, formulae of the form $\neg(A \wedge \neg A)$ are true in every valuation. **LP** does, however, invalidate certain classically valid rules of inference. The obvious is explosion ({A, $\neg A$} $\models$B), but the disjunctive syllogism and *modus ponens* with the material conditional are also invalid.[6] In this respect, **LP** can be said to be properly inferentially weaker than classical

[6] This latter invalidation obviously causes a problem for the dialetheist using **LP**, as it entails that the material conditional fails to detach within the logic. Now, given that a zero-order logic needs to contain a detachable conditional to be suitably expressive, the dialetheist must supplement her logic with a suitable detachable conditional. For accounts of how this may be achieved see Beall [5, Ch. 2] and Priest [34, Ch. 6].

logic, for its set of valid rules of inference is a proper subset of that of classical logic.

Having considered dialetheism's content, motivation, and historically most prominent logic, we are now in a position to evaluate Beziau's and Tkaczyk's criticisms of **LP** and the dialetheist's arguments, respectively. We begin by considering Beziau's criticism of **LP**.

3. Beziau on the logic of paradox

In his paper "Trivial Dialetheism and the Logic of Paradox", Beziau argues that the dialetheist who uses **LP** as a logic is committed to every contradiction being true, which, given that every proposition has a negation and the meaning of 'contradiction', entails that the dialetheist would be committed to trivialism (Definition 3). Consequently, given that the dialetheist does not wish to be committed to trivialism, **LP** simply does not adequately model the dialetheist's thesis — she requires a different logic.

Beziau begins by quoting Priest [35], that "a dialetheia is a sentence A such that both it and its negation $\neg A$ are true." Given what we know about the dialetheist's commitments to the normal semantics for negation (Dii), it follows trivially from Lemma 1 that this definition of dialetheia is equivalent to the following:

Definition 7. A *dialetheia* is a truthbearer that is both true and false.

Using this definition of dialetheia, Beziau then proposes that, firstly, "any atomic formula S [in **LP**] is a dialetheia,"[8, p. 52] and, secondly, that "every molecular formula is a dialetheia" in **LP** [8, p. 54], which would conjointly entail that every formula was a dialetheia, and thus true (as well as false). Consequently, from **LP** trivialism ensues.

Unfortunately, Beziau is mistaken on both counts. Let us begin with the case of atomic formulae. Using the Kleene matrices given above, Beziau [8, p. 52–53] argues as follows:

> In **LP**, if we restrict the name 'true' to the value 1, no formula is a dialetheia. This choice does not make sense for someone who is interesting [sic] in dialetheias. On the other hand, if we use the name 'true' for both designated values 1 and $\frac{1}{2}$, then any atomic formula S is a dialetheia: according to this matrix semantics, given an atomic formula S there is a distribution of truth-values giving to it the value

> $\frac{1}{2}$. In the unique extension of this distribution into a valuation the value of the negation of this formula $\neg S$ is also $\frac{1}{2}$. *Snow is white*, *2+22=4*, *I am lying* are therefore all dialetheias.

Beziau here conflates *truth-in-an-interpretation* and truth *simpliciter*. Beziau is correct that if a formula S is assigned both true and false (or, assigned $\frac{1}{2}$ in matrix terminology) in an interpretation, then the negation of S, $\neg S$, is also both true and false in that interpretation. This does not show that every formula is a dialetheia, however. Dialetheia are not truthbearers that are both true and false *in an interpretation*. They are truthbearers that are both true and false *simpliciter*.

What *does* follow from Beziau's contention is that **LP** does not *preclude* any atomic truthbearer from being a dialetheia. Yet, there may be nothing philosophically bizarre or worrying about this result. If one perceives there to be no logical barrier to a proposition being both true and false, as the dialetheist does not, then there's no need to preclude the logical possibility of any particular atomic formulae being both true and false. Indeed, this result is no different from classical logic's failing to preclude any particular *atomic* formula from being true.[7]

As it stands then, all Beziau's argument establishes is that **LP** does not preclude any atomic truthbearer from being a dialetheia (both true and false) *in an interpretation*. However, this neither commits **LP**'s advocates to the claim that every atomic truthbearer is a dialetheia, as *truth-in-an-interpretation* does not entail truth *simpliciter*, nor seems obviously problematic. The dialetheist has no more a wish to logically preclude any particular atomic truthbearer from being a dialetheia than the classical logician has to logically preclude an atomic truthbearer from being true.

On to Beziau's [8, p. 54] second contention, that every molecular formula in **LP** is a dialetheia. Here's the proof:

> Consider a molecular formula M. There is at least one distribution of truth-values giving to all its atomic formulas the value $\frac{1}{2}$. The unique extension of this distribution to a valuation obviously gives the value $\frac{1}{2}$ to M and also to $\neg M$.

Beziau is correct that once a logic which respects the normal semantics for the Boolean connectives admits that every atomic formula can be a

[7] The situation is obviously different for *molecular* formulae in classical logic, which we'll come to shortly.

dialetheia *in an interpretation*, it follows that for every molecular formula M, there is at least one interpretation in which M is a dialetheia.[8] Indeed, it's easy to establish through induction that in **LP** there is a trivial interpretation, that is, an interpretation in which *every* formula is a dialetheia (and thus true):

Theorem 1. *There is a trivial interpretation (an interpretation in which every formula is a dialetheia) in* **LP***.*

Proof. We prove by induction.

Base: **LP** places no logical constraints on atomic formulae being dialetheia in an interpretation. Therefore, trivially, there is an interpretation of **LP** in which every atomic formula is a dialetheia.

Inductive Clause: Let A and B be formulae which are dialetheia in the interpretation. Given the meaning of negation, conjunction, and disjunction in **LP**, it follows immediately that formulae of the form $\neg A$, $A \wedge B$, and $A \vee B$ are also dialetheia in the interpretation. $\square$

However, again, this proof does not show that every formula, including molecular formulae, is *actually* a dialetheia. All it demonstrates is that every formula is a dialetheia *in an interpretation*. Now, obviously, this is where **LP** differs from classical logic. While in classical logic there is an interpretation in which every *atomic* formula of the language is true, given that no negation of a formula A can be true in an interpretation in which A is, there's no interpretation in classical logic in which *every* formula (or, *molecular* formula) is true. Why, though, is it problematic that **LP** fails to preclude any formula, atomic or molecular, from being a dialetheia? After all, it does not commit the dialetheist who uses **LP** to every truthbearer, atomic or molecular, actually being a dialetheia. Rather, it simply ensures that she can not *logically* preclude any truthbearer from being a dialetheia. Indeed, one could reasonably believe that, once we admit the possibility of dialetheia, we ought not to logically prescribe which types of formulae can be dialetheia and which

[8] Beziau is wrong to suggest, however, that this fact establishes that "there are no antilogies in **LP**, i.e., formulas which are always false, i.e., having always the value 0," [8, p. 54]. As we noted earlier, there are logical falsehoods in **LP**, such as propositions of the form $A \wedge \neg A$. What **LP** does not contain are formulae that are false *only* in every interpretation, that is *never true*, but this is not equivalent to **LP** failing to contain formulae which are false in every interpretation. This is an example of the matrices being potentially misleading when representing **LP**'s semantics.

not. After all, as the self-referential paradoxes have taught us, these dialetheia are slippery customers — who knows when one will pop up?

You might wonder, though, if **LP** does not preclude any truthbearer from being a dialetheia, how does the dialetheist ensure that trivialism is not true? That is, how does the dialetheist ensure that not every truthbearer is a dialetheia? Well, the same way in which the classical logician precludes the truth of atomic truthbearers — by relying upon *non*-logical evidence. What exactly these non-logical considerations are is obviously well beyond the bounds of this paper, but they are sure to include empirical considerations, explanatory considerations, and perhaps even wider metaphysical considerations. This is a point well made by Priest [32, p. 34]:

> It might be argued that if it is logically possible for any contradiction to be true [...] then all contradictions are rationally acceptable. This, though, most certainly does not follow either. The fact that something is a logical possibility does not entail that it is rational to believe it. It is logically possible that I am a fried egg, though believing that I am is ground for certifiable insanity.

In working out whether a claim is true, the dialetheist using **LP** is in the same position as the classical logician except that *before she considers the other relevant evidence*, her logic precludes less possibilities.

Beziau [8, p. 55] finishes his paper claiming that,

> What has been pointed out in this paper, i.e. that any formula in **LP** is a dialetheia, is not something against **LP** or dialetheism, it only shows that **LP** is not compatible with relative dialetheism [the thesis that *dialetheism*, but not *trivialism*, is true].

We have shown here that Beziau is mistaken to think that, i) any formula in **LP** is a dialetheia, and thus that ii) **LP** is not compatible with a non-trivialist dialetheism. Firstly, all Beziau has shown is that every formula in **LP** is a dialetheia *in an interpretation*, which in principle is no different to showing that the proposition 'Barack Obama is a fried egg' is true *in some interpretations* in classical logic. Neither entail truth *simpliciter*. To show that **LP** commits the dialetheist to all formulae being dialetheia would require showing that in *every* interpretation in which *some* formula is a dialetheia, *every* formula is a dialetheia. Yet, this is trivially not true of **LP**, for it is a paraconsistent logic. Secondly, even though the dialetheist can not *logically* preclude any formula being a dialetheia using **LP**, there are other means to demonstrate that a proposition is not true, such as empirical evidence. Thus, the inability to *logically* preclude a proposition's truth certainly does not ensure that the dialetheist is committed to the proposition's truth.

Yet while Beziau's arguments are ultimately unconvincing, his doubts over the adequacy of **LP** for the dialetheist's purposes are not wholly without merit. Underpinning those doubts may indeed be the reasonable concern that **LP** does not contain the means with which to express that a proposition *is not* a dialetheia, i.e. that it's either *consistently* true or *consistently* false, and consequently that if the dialetheist is to use **LP** she will herself lack the expressive resources with which to express that a proposition is not a dialetheia. We earlier asked why it might be considered problematic for **LP** to fail to preclude any formula, atomic or molecular, from being a dialetheia, and in truth certain potential problems with this failure are forthcoming.

The damaging consequences of **LP**'s being incapable of expressing that a proposition is *not* a dialetheia were first recognised by Parsons [28]. Parsons appreciated that by using **LP**'s semantics, and allowing propositions to be both true and false, the dialetheist could not disagree over the truth of a proposition with another party by simply stating that the proposition in question was false, as this does not preclude the proposition from *being true also*.

In response to Parsons' concern, Priest [34, Ch. 6] has since chosen to explain the dialetheist's ability to communicate disagreement through pragmatics, rather than through **LP**'s semantics. The mutually exclusive speech acts of assertion and denial were introduced, with the assertion of a proposition p conceived of as an endorsement of p, and the denial of p conceived of as a *sui generis* speech act which precludes an individual's endorsement of p. Thus, rather than disagreeing with another party's claim that p is true by stating that the relevant claim is 'false only', or asserting the negation of p, the dialetheist simply denies p.

Yet, while the dialetheist may be able to communicate disagreement through pragmatics, as has been stressed in numerous places (see [23, 26, 38]), the dialetheist's inability with **LP** to communicate that a proposition is not a dialetheia, and thus either preclude its truth or falsity, is a continued problem. To concentrate on Shapiro's [38] criticism, even if the dialetheist can successfully express disagreement with denial, there are contexts in which one can not successfully substitute the speech act of denial for the concepts of 'consistently true' or 'consistently false'. For example, if one wants to suppose that a proposition p is false only and derive the consequences, this can not be achieved with the denial of p as force operators can not meaningfully be embedded into truth-functional contexts such as conditionals. This problem case demonstrates that a dialetheic semantics must be able to preclude a proposition's truth or falsity to accommodate meaningful conditionals. Consequently, even if the dialetheist is able to accommodate a pragmatics of disagreement, despite her semantic's inability to preclude a proposition's truth or falsity, her inability to express the concepts of true *only* and false *only* entail other expressive limitations within a dialetheic semantics, including accounting for meaningful conditionals.

This inability to account for meaningful vernacular statements within her semantics is particularly damaging for the dialetheist, given that a common motivation for dialetheic semantics is its ability to account for certain meaningful linguistic phenomena, such as the liar, which classical semantics can not comfortably. Thus, for the dialetheic research programme to live up to its own standards, in being able to accurately express meaningful English expressions such as 'Assume that a proposition p is false only', it seemingly ought to be able to preclude a proposition's truth (and falsity) within its semantics. Thus, while **LP** fails to be inadequate for the dialetheist's purposes, as Beziau suggests, by committing her to every proposition being a dialetheia, the logic may indeed be inadequate for failing to contain the expressive power to preclude a proposition's being a dialetheia, which brings with it further unsavoury consequences.

Now, the dialetheist may undoubtedly rectify this expressive problem temporarily. After all, she may introduce a *consistent truth* operator into her logic, allowing her to preclude a proposition from being a dialetheia. Using Beziau's preferred matrices presentation, we can introduce the operator $^{\mathrm{CT}}$:

	CT
0	0
$\frac{1}{2}$	0
1	1

The resulting logic including the operator, $\mathbf{LP}^{\mathrm{CT}}$, can express both a proposition's consistent truth or consistent falsity quite simply as $^{\mathrm{CT}}A$ and $^{\mathrm{CT}}\neg A$, respectively.[9] Buying this expressive power comes at a cost

[9] This resulting logic is also a *Logic of Formal Inconsistency* (**LFI**), a glutty logic

for the dialetheist, however. While on the one hand a dialetheic logic with a consistency operator facilitates the preclusion of a proposition's truth or falsity, on the other it undermines the dialetheist's ability to provide a comprehensive solution to the self-referential paradoxes, as revenge paradoxes such as,

(ζ) ζ is not consistently true,

appear. If the dialetheist provides a dialetheic solution to (ζ), so that the sentence is both consistently true and not consistently true, then the $^{\mathrm{CT}}$ operator no longer serves its intended function of precluding propositions' falsity; it would turn out that a proposition could be consistently true while also being false.

Now, while it's hardly surprising that introducing a consistency operator would produce further revenge paradoxes, after all one of the principles underlying the dialetheic research programme is that one simply can not stipulate or force consistency, the occurrence of such revenge paradoxes does cause a problem for dialetheism. It ensures that the dialetheist must choose between providing a semantics which has the expressive power to preclude a proposition's truth or falsity and providing a comprehensive solution to the semantic paradoxes. It seems one can not do both. This apparent tension could be even more troublesome for the dialetheist if one grew to believe that the only reasonable motivation for dialetheism was its putative ability to provide a comprehensive solution to the self-referential paradoxes. When evaluating the success of the dialetheic research programme, one would be forced to choose between its ability to provide a comprehensive solution to the self-referential paradoxes and the inability of its semantics to preclude the truth or falsity

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that can recapture classical validity on the assumption that every member of the premise set behaves consistently [24]. Consequently, classically valid rules of inferences, such as the disjunctive syllogism, which are invalidated in **LP** are recaptured within an extension of **LP** that includes the consistent truth operator, $\mathbf{LP}^{\mathrm{CT}}$, on the assumption that the premise set behaves consistently. This ensures that $\mathbf{LP}^{\mathrm{CT}}$ can help the dialetheist answer another potential criticism — explain the apparent success of important rules of inference which **LP** disregards as invalid. With $\mathbf{LP}^{\mathrm{CT}}$ the dialetheist can answer confidently that inferring according to the disjunctive syllogism, for example, is successful so often because we very rarely confront true contradictions, and the disjunctive syllogism only fails to be truth-preserving in such glutty situations. **LFI**s are of obvious practical importance, allowing us to handle inconsistencies non-trivially while being as inferentially strong as classical logic once we presume, as classical logic does, that the situations under discussion behave consistently.

of certain propositions, and thus express certain meaningful vernacular sentences.

Our purpose here is not to indicate which of these successes or failings one should assign a greater weighting to in evaluating the dialetheic research programme, but rather to make two far more modest observations. Firstly, while Beziau was mistaken to think that **LP** committed the dialetheist to trivialism, the underlying point that **LP** does not contain the expressive resources to preclude a proposition's truth or falsity, and thus express that the proposition fails to be a dialetheia, does seem to be a genuine problem. Secondly, given that solving this problem would seem to require the dialetheist giving up the project of providing a comprehensive solution to the self-referential paradoxes, in evaluating the dialetheic research programme's success one would need to engage in a process of philosophical cost-benefit analysis. One would need to weigh up the research programme's strengths and weaknesses, and compare its overall benefits to those of its competitors, whether this be a classical or some other solution to the self-referential paradoxes. This latter point brings us appropriately onto Tkaczyk's criticisms of the dialetheist's arguments for the existence of true contradictions.

4. Tkaczyk on the deficiency of dialetheic arguments

In his engaging paper "The case of dialetheism", Marcin Tkaczyk [42] carefully presents dialetheism and the arguments proposed for it, including the self-referential paradoxes [33, Ch. 1–2] and the putative contradictions that appear at the limits of expression and thought [30]. After proposing that the strength of the dialetheist's arguments is based on the presumption that vernacular evidence is *prima facie* reliable, Tkaczyk [42, p. 221] goes on to offer three objections to the arguments:

> Firstly, the key assumption of reliability of the vernacular supports classical logic. Secondly, once logic is subject to revision so are all *prima facie* contradictions, including alleged dialetheias. Thirdly, willy-nilly, when arguing for dialetheism a dialetheist involves and assumes classical logic, including the principle of contradiction.

As with Beziau, Tkaczyk's charges are misplaced. To demonstrate this, we will concentrate on just one of the dialetheist's putative examples of true contradictions — the liar sentences. Given that Tkaczyk is attempting to establish that *all* of the dialetheist's arguments suffer from his criticisms, we can show the criticisms to be unsuccessful by providing at least one dialetheic argument of which they are not true. Additionally, our concentrating on the liar sentences is well-motivated given that they are undoubtedly the most potent of the dialetheic arguments, and thus the appropriate cases to use when evaluating putative general weaknesses with dialetheic arguments.

As suggested in Section 1, according to Tarski's [39, pp. 348–349] analysis of the liar paradox, to block the occurrence of a true contradiction in a natural language L, and thus the subsequent necessary rejection of classical logic, one must either (i) restrict the semantic closure of L, or (ii) restrict the applicability of the T-schema in L. As we've mentioned, and as Tkaczyk [42, pp. 208–209] recognises, the dialetheist argues that either restriction requires too much, for both would necessitate counting many meaningful sentences of natural languages meaningless. Consequently, according to the dialetheist, we ought to neither restrict L's semantic closure nor the universal applicability of the T-schema in L, and rather admit the true contradiction that follows from (λ) and suitably revise our logic. What, then, is so objectionable about the dialetheist's argument?

Well, firstly, according to Tkaczyk [42, p. 221], Priest's solution to the liar, along with his other arguments for dialetheism, relies on the presumption that "the vernacular (common sense, intuitive) knowledge is reliable," which is why he believes Priest is happy to admit that the "inconsistent vernacular serves better that [sic] artificial inconsistent languages. The inconsistent common sense theory of truth (and other semantical notions) seems to be preferable to artificial ones," [42, p. 209]. Indeed, Priest wants his readers to accept that as "intuitive knowledge is filled with contradiction [. . .] [we ought] to learn to live with it instead of searching how to cure it," [42, p. 221]. So, according to Tkaczyk, the dialetheist's argument for true contradictions, and thus the revision of classical logic, based upon the liar sentences only holds weight on the assumption that we ought to believe that commonsense knowledge is reliable.

By committing the dialetheist to the claim that commonsense knowledge is reliable, Tkaczyk believes we can provide a damaging counter to the dialetheist, for "classical logic is definitely miles more vernacular, common sense and intuitive than the jungle of paraconsistent calculi," [42, p. 221]. So, if the dialetheist wishes to endorse the reliability of commonsense knowledge she ends up undermining her own solution to the paradox for, according to her own principle, she ought to endorse classical logic and not a dialetheic logic.

Three important points emerge regarding the first of Tkaczyk's objections. Firstly, the dialetheist certainly does not accept the principle that commonsense knowledge is reliable. Secondly, contrary to what Tkaczyk suggests, we have no reason to think that classical logic accurately models common sense to a greater extent than paraconsistent logics and, thirdly, the main goal of many logics is not to model how people actually reason. Let us consider these points in turn.

According to Tkaczyk [42, p. 221],

> The *bona-fide* truths a dialetheist relies on belong mostly to the common sense knowledge. For example, the unrestricted definition of truth, the unrestricted principle of abstraction are *bona-fide* truths... [The dialetheist presumes that as] those assumptions are *bona-fide* truths and entail contradictions, it should be accepted that there exist dialetheias.

Yet, while it's true that the dialetheist appeals to the unrestricted T-schema in her discussion of the liar, this is not because she believes that there is some intuitive common-sense knowledge that supports dialetheism. The dialetheist does not simply say, 'Look, speakers of English are willing to endorse contradictions as true, so this gives us good reason to believe they are', nor does she argue that normal competent English speakers will endorse the unrestricted T-schema (though she may suggest that the behaviour of English speakers conforms to the unrestricted T-schema). Rather, she argues *for* the unrestricted T-schema, considering possible means through which to deny the unrestricted T-schema, and finding all such means to either lack independent philosophical motivation or to fail to ultimately solve the self-referential paradoxes they intend to. Priest's general argument is that we should not simply be willing to give up the unrestricted T-schema because it produces, in combination with semantic closure, true contradictions. We need *principled reasons* for doing so, as "it is not in doubt that we can avoid the paradoxes if we can make any move we like... [and consequently] a putative solution that is not backed up by an independent rationale is just an intellectual fraud," [34, p. 14]. Priest's conclusion having considered the other putative non-dialetheic solutions available at the time was that they were *ad hoc*, i.e., not based on principled considerations, and/or came at the cost of precluding the meaningfulness of many English sentences (or, at least, distorting their meaning).

Each position that one can take regarding the liar sentences comes with its own challenges. By admitting both the unrestricted T-schema and semantic closure, the dialetheist takes on her own burden of providing a philosophically reasonable account of true contradictions, including an appropriate logic, truth theory and pragmatics [5, 33, 34]. In contrast, by restricting the T-schema, one is forced to admit that many sentences of English are meaningless, when we are perfectly aware as users of the language that they are meaningful. Thus, if one wished to so restrict the universality of the T-schema, one would be required to disagree with the dialetheist over the theoretical weight they assign to preserving the meaningfulness of these sentences. One could propose that, having encountered the liar sentences, the only sensible course of action is to deny their meaningfulness, contrary to linguistic evidence, with the reward of rescuing classical logic. This is certainly a theoretical option. However, it is important here to recognize that in forming her argument the dialetheist does not simply rely on 'commonsense knowledge'. The question of whether the T-schema is unrestricted or not is not a matter of common sense, and if the dialetheist uses the apparent meaningfulness of English sentences involving the truth predicate to support her claim, this is based on the credible principle that our logic ought not to restrict expressibility unless it's unavoidable. The dialetheic argument is not so different in nature to the considerations which led to classical logic overthrowing traditional Aristotelian logic. There were many meaningful propositions and valid inferences, including mathematical truths, which Aristotelian logic could not account for. Classical first-order logic did a better job, as it had far greater expressive power. Similarly, dialetheists argue that dialetheic logics can accommodate certain phenomena that classical logic can not, such as the liar sentences. Whether they successfully achieve this is a difficult question, but their arguments certainly are not built on a simple appeal to commonsense knowledge.

Secondly, even if Tkaczyk is correct in thinking that the dialetheist's arguments rely on the principle that "vernacular (common sense, intuitive) knowledge is reliable," he is not justified in claiming that endorsing this principle undermines the dialetheic arguments because classical logic is "definitely miles more vernacular, common sense and intuitive" than paraconsistent logic [42, p. 221]. For one, principles of classical logic, such as explosion, certainly are not intuitive or common sense. Anyone who has taught a first-year logic class sees the astonishment on the faces of students when the principle is explained. Additionally, no one reasons according to explosion. If a scientist collects inconsistent data, and is not willing to simply reject one of the inconsistent pieces of data outright, she does not then simply infer everything from the inconsistent set [27]. This would suggest that individuals often do, and wish to, reason paraconsistently. This is one of the reasons that paraconsistent logics are so valuable.

It is unclear that Tkaczyk provides any reason to believe that classical logic is intuitive. While it is true that, as Tkaczyk [42, p. 222] argues, certain dialetheic logics such as **LP** invalidate rules of inference like the disjunctive syllogism which we use constantly in our everyday lives, and thus find commonsensical and indispensable, this in itself does not demonstrate that classical logic is more intuitive. Firstly, classical logic departs from commonsense in ways that dialetheic logics do not, such as regarding the validity of explosion, and we've been given no reason to think that retaining the commonsense disjunctive syllogism should trump containing the unintuitive explosion, and thus that classical logic should be considered more intuitive than dialetheic logics. Secondly, certain dialetheic logics, namely dialetheic **LFI**s, can recapture the validity of the disjunctive syllogism within consistent situations [24], and thus can adequately explain why individuals find the validity of the inference so compelling, given that we very rarely encounter genuinely inconsistent situations, while still explaining why they are ultimately invalid. Lastly, Gilbert Harman [14] has argued extensively that no deductive model accurately represents individuals' actual reasoning. In which case, the debate over which deductive logic is the most intuitive or commonsensical is ultimately pointless, for none are.

Thankfully, the failure of deductive logics to accurately model intuitive reasoning is not an indication of deficiency, as we should we wary of even assigning this purpose to deductive logics. It is important to remember, lest we unknowingly commit ourselves to logical psychologism, that logic isn't primarily concerned with modelling how people actually reason. The usual way of stating this point is that logic is primarily concerned with implication, and not inference. The way that people actually reason is no guide to what follows from what. People make mistakes. Thus, not only do deductive logics fail to be commonsensical, but they should not aim to be!

Consequently, Tkaczyk's first objection of dialetheic arguments is mistaken in three regards. Tkaczyk claims that dialetheic arguments, (i) rely on the reliability of commonsense knowledge, but that (ii) classical logic is far more in line with commonsense knowledge than paraconsistent logics. However, (i) the dialetheic solution to the liar sentences does not rely on commonsense knowledge, (ii) it is not at all clear that classical logic is more consistent with commonsense reasoning than paraconsistent logics, and (iii) the main purpose of logic is not to capture commonsense knowledge. Let us then move onto Tkaczyk's second objection to the dialetheic arguments.

Tkaczyk [42, p. 222] recognises that "once dialetheism has been chosen, it demands a revision of logic." As we have shown, in order to resist trivialism, the position requires a strongly paraconsistent dialetheic logic. In requiring such a logic, however, Tkaczyk [42, p. 222] believes two problems arise. Firstly,

> [A]ll the antinomies have been constructed within the confines of classical logic. As any paraconsistent calculus is weaker than the classical one it should be answered whether or not *prima facie* dialetheias are to be regarded as dialetheias within the confines of the new logic. Dialetheism may clearly turn out to be self-annihilating.

And, secondly,

> [T]here is wide range of quite different paraconsistent calculi [sic]. If some revision of logic is inescapable, it might be an option to search purposefully for a logic pursuing two aims: (a) to be paraconsistent and (b) to avoid antinomies.

Let us take each of these concerns in turn. Regarding the charge that we have no reason to believe that true contradictions are derivable in a dialetheic logic, given that any paraconsistent logic is weaker than classical logic, the concern is misplaced on two counts. Firstly, there are paraconsistent logics which are not weaker than classical logics. All **LFI**s are as inferentially strong as classical logic on the presumption that the premise set behaves consistently [24], an assumption classical logic obviously shares. Secondly, it's simple to show that a contradiction can be inferred from the strengthened liar using **LP** and the unrestricted T-schema:

$\lambda \equiv \neg T(\lambda)$	(L1 – Strengthened Liar)
$T(\lambda) \equiv \lambda$	(L2 – Instance of T-Schema)
$T(\lambda) \equiv \neg T(\lambda)$	(L3 – from L1 and L2 by transitivity)
$T(\lambda) \vee \neg T(\lambda)$	(L4 – instance of LEM)
$T(\lambda) \wedge \neg T(\lambda)$	(L5 – from L3 and L4 by cases and adjunction)

Thus, Tkaczyk's first concern over a revision of logic is unfounded.

The second concern, that we have as much right, if a revision of logic is required, to revise our logic to a non-dialetheic paraconsistent logic seems as equally unfounded. Of course, once we admit that classical logic is not up to the job of accommodating liar sentences, we might search around for other logics, including non-dialetheic paraconsistent logics, which adequately explain away the liar sentences without committing us to true contradictions. The question, however, is whether any of these non-dialetheic paraconsistent logics currently are capable of doing so, and the answer at present seems to be no, at least not without significant costs. For example, we could accept a non-adjunctive paraconsistent logic, such as Jaśkowski's [17] discursive logic $\mathbf{D_2}$ without its later addition of a discursive conjunction [18], which would block the inference from L4 to L5. However, the problem with such a logic is that, firstly, invalidating adjunction restricts the logic's expressive power far too much and, secondly, all it ensures in the strengthened liar case is that we can not infer $T(\lambda) \wedge \neg T(\lambda)$ from both $T(\lambda)$ and $\neg T(\lambda)$ separately. Not much of a victory. We are still committed to true contradictories, just not true contradictions, because no conjunction can be validly inferred from the truth of its conjuncts.

It is of course possible that in the future a non-dialetheic paraconsistent logic which successfully solves the problems posed by the liar sentences will be discovered. However, until such a logic is forthcoming, the *possibility* of such a logic provides no challenge to the dialetheic solution.[10] Tkaczyk proposes that "if a dialetheia is legitimate to demand [our] logic to be non-explosive, I claim my equal right to demand it to be non-antinomial or non-dialetheic" [42, p. 223], but this is to miss the point somewhat. The dialetheist does not simply stipulate or insist that we ought to endorse a dialetheic logic. Rather they argue, extensively, that dialetheic semantics offer solutions to genuine problems, such as the liar sentences, which other available logics do not. One can claim the right to demand a non-dialetheic logic as much as one wants, but unless one can show that they offer solutions to the same problems that dialetheic logics do, they fail to offer genuine challenges to the dialetheic

[10] Actually, contrary to Tkaczyk's suggestion that we might search purposively for a non-dialetheic paraconsistent logic, if our logic's primary purpose here is to provide a solution to the liar sentences then its unclear what function a non-dialetheic paraconsistent logic could play. After all, the only rationale for a paraconsistent logic in such a circumstance would be to avoid triviality once one has admitted that contradictions follow from the sentences.

arguments, and thus to the dialetheic research programme. The only reason that the dialetheist has the right to "demand" a non-explosive logic is that she has argued extensively for true contradictions and, given that almost no one is a trivialist, the dialetheist's position necessitates a non-explosive logic.

The debate between the dialetheist and her opponents over potential solutions to the liar paradoxes is a matter of competing research programmes, whose success go beyond merely their ability to solve the paradoxes. One has to take into account the research programmes' ability to solve new logical and philosophical puzzles, and their potential failings in other regards. While the dialetheist believes that the dialetheic research programme has succeeded in providing a solution to the liar where other programmes have failed, without too great a philosophical or logic cost, others have argued against the dialetheic research programme. At times because there are more conservative solutions to the liar sentences [13], and sometimes because the dialetheic solution is too philosophically costly [22]. However, in combating the dialetheic research programme, one has to engage with the dialetheist and show exactly how one's non-dialetheic solution is as successful overall as the dialethest's. In of itself, the fact that there is the (epistemic) possibility of additional logics that can accommodate the liar does not diminish the power of the dialetheic research programme. We can not agree with Tkaczyk that "no piece of fair argument for dialetheism has been delivered," [42, p. 223]. Dialetheists have spent considerable time arguing that while dialetheic semantics can handle the liar sentences, classical and gappy semantics can not. One can disagree with them, but to do so requires showing that their solutions are not successful or that a non-dialetheic solution is more successful. That is how debates between competing research programmes work. Consequently, Tkaczyk's suggestion that we *might* be able to find a non-classical, but non-dialetheic, logic which adequately solves the liar sentences is hardly a challenge to dialetheism. Potential challengers are not necessarily actual challengers.

Let us move onto Tkaczyk's third and final concern. According to this final objection, the dialetheist's "arguments themselves assume classical logic, and especially the principle of contradiction," [42, p. 223]. This is a perplexing claim and requires clarification. We've already provided a presentation of the dialetheic solution of the strengthened liar, and nowhere is the **LNC** presupposed. Obviously, dialetheic semantics share certain features of classical logic, such as adjunction and addition, but this no more entails that dialetheist arguments presume classical semantics than classical arguments presume dialetheic semantics.

However, Tkaczyk [42, p. 223] thinks that in virtue of admitting true contradictions, the dialetheist ought not to be compelled to reject many claims they do:

> Once dialetheism is seriously taken, there is no reason to reject the principle of contradiction, the Duns Scotus Rule (Explosion) or classical logic any more. An honest dialetheist would rather face the truth that all sentences are true and are not, the principle of contradiction holds and does not hold etc.

This just simply is not true. Let us take each of the contentions in turn.

Firstly, Tkaczyk thinks that the dialetheist, if they take dialetheism seriously, ought not to be reject classical logic. Well, she can hardly accept classical logic, because the logic does not allow for contradictions to be true! Thus, it's difficult to understand how accepting classical logic would be tantamount to taking dialetheism seriously. Taking dialetheism seriously entails admitting true contradictions, which subsequently entails accepting a dialetheic logic. Now, of course, the dialetheist might choose to not *reject* classical logic while accepting a dialetheic logic, for she may be a logical pluralist [7], however it is not accurate to say that taking dialetheism seriously entails not rejecting classical logic. Unless one is a logical pluralist, given that classical logic does not allow for true contradictions it seems obvious that the dialetheist is obliged to reject classical logic, just as the classical logician is obliged to reject a dialetheic logic.

Secondly, Tkaczyk claims that the dialetheist has no reason to reject explosion. But, why should we presume that just because one has good reason to believe a contradiction is true that one has good reason to believe that *all propositions* are true? Why should providing a dialetheic solution to the liar paradoxes commit one to trivialism? After all, we now have logics that block this implication. Tkaczyk's suggestion presumes that once one admits the possibility of true contradictions all rational constraints go out of the window. Yet, this is patently false. Even if we were to allow for true contradictions there are plenty of considerations that can cause us to not endorse the truth of a statement — the lack of empirical evidence for the claim, for example. Priest [33] has spent many pages over the years showing that there are many rational constraints that do not depend on precluding the truth of contradictions. While it is of course open to the dialetheist to admit the contradiction that 'All sentences are true while they are not all true, at the same time', the dialetheist is not committed to accepting the claim just because it is a contradiction. The dialetheist is no more required to admit that every contradiction is true simply in virtue of it being a contradiction than the classical logician is required to admit that every proposition is true simply because she asserts that some are true. The dialetheist needs good reason to believe that a contradiction is true, and the dialetheist will obviously say we have very good reason to believe that this particular contradiction is not true because we have excellent evidence that not all sentences are true. No sane dialetheist thinks that Barack Obama is a fried egg.

Lastly, Tkaczyk proposes that not only does the dialetheist have no reason to reject the **LNC**, but that "the principle of contradiction is being actually assumed by dialetheists' arguments," and thus that "the thesis of dialetheism should be rejected by self-annihilation," [42, p. 223]. In response to this concern, firstly, it's important to recognise that the dialetheist does not reject certain versions of the **LNC**. Indeed, the formal version of the **LNC**, $\neg(A \wedge \neg A)$, is a theorem of **LP**. Additionally, the dialetheist would be happy to admit that 'All contradictions are false'—it is just that some happen to be true also. However, neither of these versions of the **LNC** are used or presupposed in the dialetheist's argument for the strengthened liar being a dialetheia, nor do either show that dialetheism should be rejected through self-annihilation. After all, given that the dialetheist has no principled reason to fear contradictions, she can reasonably hold $\neg(A \wedge \neg A)$ as a theorem while admitting $A \wedge \neg A$, for some A's, and admit that all contradictions are false while some are also true, permitting both of these contradictions as a consequence of the meaning of the Boolean connectives.

Now, it's also true that some versions of the **LNC** reasonably preclude the truth of dialetheism. Take, for example, Tkaczyk's [42, 206] definition of the **LNC**:

($\mathbf{LNC_T}$) Every set of true sentences is consistent.

Given that the dialetheist asserts that the set of true sentences is *in*consistent, the dialetheist seems to have good reason to reject $\mathbf{LNC_T}$.[11]

[11] Unless, that is, the dialetheist can reasonably propose that a set of true sentences can both be consistent *and* inconsistent—a proposal which I'm not aware has been endorsed by any dialetheist. Liars such as (ζ), however, may force the dialetheist

Yet, the fact that the dialetheist rejects $\mathbf{LNC_T}$ is hardly damaging for her, for nothing like this principle is required by the dialetheist to infer a contradiction from (λ).

Thus, firstly, while the dialetheist does accept some versions of the **LNC**, those which she does are not in any sense troubling for the dialetheist's thesis. Secondly, while there are seemingly some versions of the law, such as $\mathbf{LNC_T}$, which are incompatible with the dialetheist's thesis, she relies upon no such principle in inferring a contradiction from (λ). Consequently, it seems Tkaczyk is mistaken to suggest that the "thesis of dialetheism should be rejected by self-annihilation" because the dialetheist's arguments rely upon a version of the **LNC** that precludes her theory's truth. No such principle is ever relied upon.

Given what has been said, it seems clear that the dialetheist's arguments neither presume classical logic nor the **LNC**. Additionally, given that she does not presume any version of the **LNC** which is troubling for her theory within her argument for (λ) being a dialetheia, the **LNC** gives us no reason to believe that dialetheism self-annihilates. Indeed, if a version of the **LNC** were presumed by the dialetheist in inferring a contradiction, it's difficult to understand how endorsing that version of the **LNC** could be said to lead to self-annihilation through precluding true contradictions. After all, if it were used in inferring a contradiction, then it obviously does not preclude contradictions! Consequently, as with Tkaczyk's other concerns with dialetheism, his third objection to the dialetheist's argument is ultimately unsuccessful.

In answering Tkaczyk's concerns we have considered three criticisms of the dialetheist's arguments: (i) That the dialetheist's arguments rely upon commonsense knowledge, and that classical logic is far more commonsensical than any paraconsistent logic. (ii) If the liar sentences and other phenomena require us to revise our logic, why not revise it to a non-dialetheic paraconsistent logic? (iii) Dialetheic arguments assume classical logic, and the **LNC**, which ultimately leads to dialetheism's self-annihilation. Using the most famous of the dialetheic arguments, the liar sentences, we have found these concerns to be groundless.

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to make such a concession, in which case the dialetheist will not reject $\mathbf{LNC_T}$ after all, and it may no longer be correct to say that $\mathbf{LNC_T}$ precludes dialetheism's truth.

5. Conclusion

In replying to Beziau's concerns over **LP** and Tkaczyk's criticisms of dialetheic arguments, nothing which has been said here suggests either that **LP** is ultimately a satisfactory logic for the dialetheist's purposes, or that the dialetheic arguments for true contradictions are ultimately successful. Rather, our sole purpose has been to seek clarification over the concerns that both Beziau and Tkaczyk raise. By understanding why these challenges to dialetheism, and the competency of dialetheic logics, are ultimately inadequate we can come to understand the dialetheic position more comprehensively and, subsequently, be better informed regarding whether and how dialetheism is philosophically inadequate. We can only hope that this paper has succeeded in furthering these worthy aims.

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