1. Introduction: Bridge Principle and the Normative Argument against Explosion

We are logically imperfect beings. However careful we may be, we may still have contradictory beliefs. Suppose you draw lots. The lottery, you believe, contains only one winning ticket. Since the lottery contains millions of tickets, the probability that yours is a winning ticket is extremely low. So, you believe that it isn’t a winning ticket. But, by parity of reasoning, for each ticket \( i \), you come to believe that \( i \) isn’t a winning ticket. Thus, you have contradictory beliefs.

It seems, however, that if we have any beliefs then we ought to believe their logical consequences. There is something wrong with you when you believe that a rose is red, but at the same time fail to believe that a rose is colored. You ought to believe that a rose is colored also. But, given that we have contradictory beliefs, this poses us a serious problem. In classical logic, the rule of EXPLOSION states that contradictory propositions logically entail any proposition whatsoever \((P, \neg P \Rightarrow Q, \text{ for any } Q)\).\(^1\) (I will use \( \Rightarrow \) as a sign for logical consequence relation, putting aside the question of how to characterize the relation.\(^2\)) Given that we have contradictory beliefs, we ought to believe any proposition whatsoever. However, it is not the case that we ought to believe any proposition whatever we like!

Some philosophers [most notably, Priest (1979a)] take this as reductio ad absurdum of classical logic, in particular, EXPLOSION. They opt for logics without EXPLOSION, called paraconsistent logics. Though, at first sight, EXPLOSION itself may not seem intuitively correct, it can be easily derived from DISJUNCTIVE SYLLOGISM: \( P, \neg P \lor Q \Rightarrow Q \).\(^3\) Thus, paraconsistent logicians typically need to reject

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\(^1\) Alternatively, \( P \& \neg P \Rightarrow Q \), for any \( Q \). In this paper, I will not distinguish these two formulations of EXPLOSION.

\(^2\) \( \Rightarrow \) may be semantically [Tarski (1986b), Beall and Beall (2005)] or proof-theoretically characterized [Read (2017)]. Alternatively, one might take \( \Rightarrow \) as primitive. I’ll not take any stand on this matter, since the controversy isn’t directly related to the normativity of logic.

\(^3\) Since \( P, \neg P \Rightarrow P, \neg P \lor Q \) (which is, for example, in a sequent calculus, assured by Right \( \lor \)-Introduction)
DISJUNCTIVE SYLLOGISM. But giving up DISJUNCTIVE SYLLOGISM is a significant cost that we would rather avoid.

Now, proponents of the kind of argument above need to assume a principle bridging between logical consequence and norms for our beliefs, which MacFarlane (2004) calls bridge principle. The idea is that logical consequence does not only state logical relationship between statements, but also has normative significance for our beliefs. For this reason, the kind of argument above is called normative argument against EXPLOSION. As we will see, there are different bridge principles. Accordingly, there may be different normative arguments to be considered.

As MacFarlane (2004) observed, bridge principles have the following common form:

BRIDGE PRINCIPLE

If \( (P_0, P_1, \ldots, P_n \Rightarrow Q) \), then (normative claim about believing \( P_0, P_1, \ldots, P_n, \) and \( Q \)).

Obviously, there are many instances of this form. Here are just a few examples. Given \( P_0, P_1 \Rightarrow Q \), one might say that it is obligatory that if we believe \( P_0 \) and you believe \( P_1 \), we believe \( Q \). Alternatively, one might say that if we believe \( P_0 \) and we believe \( P_1 \), we may believe \( Q \).

Since a bridge principle is used as a premise of a normative argument, it must be plausible in its own right. Otherwise, classical logicians would reject it rather than give up EXPLOSION. Thus, paraconsistent logicians must seek for a plausible bridge principle so that their normative argument will be effective [Steinberger (2016a), pp. 390–391].

Some of bridge principles can be easily rejected. Consider the bridge principle used in the normative argument above. The principle states that if we believe something then we ought to believe its logical consequences. John Broome (2000, p. 85) showed this is false. Suppose John stupidly believes \( 0 = 1 \). Since \( 0 = 1 \) logically entails itself \( (0 = 1 \Rightarrow 0 = 1) \), it follows that John, who believes \( 0 = 1 \), ought to believe \( 0 = 1 \). This is absurd, since just believing \( P \) does not obligate one to believe \( P \). Therefore, the principle should be rejected. Note that Broome’s objection generalizes, since it is independent on a normative concept used in a bridge principle. For example, we should also reject, for the same reason, the principle that given \( P_0, P_1 \Rightarrow Q \), if you believe \( P_0 \) and you believe

and, by DISJUNCTIVE SYLLOGISM, \( P, \neg P \lor Q \Rightarrow Q \). By transitivity of \( \Rightarrow \), \( P, \neg P \Rightarrow Q \).

4 Priest’s LP is among such logics [Priest (1979b)]. Adding DISJUNCTIVE SYLLOGISM to LP, we get classical logic [cf. Field (2009), p. 79–82].

5 As stated above, philosophers have different views on what this logical relationship amounts to. As a theoretical possibility, one might say that there is no logical relationship besides what is embodied in a bridge principle. I will not consider legitimacy of this claim.

6 For other instances and classification of bridge principles, see MacFarlane (2004). REASON CLOSURE, the bridge principle which I endorse in this paper, is similar to, but substantially different from what he calls Br+, which states that, given \( P_0, P_1 \Rightarrow Q \), if we have reason to believe \( P_0 \) and have reason believe \( P_1 \), we have reason to believe \( Q \). For discussion of Br+ and differences between Br+ and REASON CLOSURE, see Section 2.
As noted above, for a normative argument to be effective, the bridge principle used in the argument must be plausible. Florian Steinberger (2016a) tried to show that all normative arguments are ineffective, by repudiating many bridge principles that might be used in normative arguments. In this paper, I will present and argue for a bridge principle, REASON CLOSURE, which he hasn’t considered (Section 2) and show how to construct a normative argument based on REASON CLOSURE in the light of deflationary theory of truth (Section 3). In Section 4, I will consider how to defend classical logic in the face of the normative argument by closely examining REASON CLOSURE.

2. Reason Closure

Steinberger (2016a) approached the problem by checking bridge principles almost one by one following MacFarlane’s classification of them. Here I will not follow suit. Rather I will find out a correct bridge principle is correct by looking into other fields of philosophy where similar principles are proposed (Section 2.1). Roughly, REASON CLOSURE (RC), the bridge principle that I endorse in this paper, states that if \((P \Rightarrow Q)\) and (we have reason to believe \(P\)) then we also have reason to believe \(Q\). I will show that RC is not only supported by confirmation-theoretical and epistemological consideration, but also avoids central objections to bridge principles (Section 2.2). In Section 3, I will consider whether REASON CLOSURE could be successfully used as a premise of a normative argument against EXPLOSION.

2.1 Special Consequence Condition and Epistemic Closures

The first area I will explore is confirmation theory, a branch of philosophy of science. In science we have many hypotheses in science. Some of them are not only believed, but also confirmed by an evidence. Explication of this confirmation relation is the aim of confirmation theory.

Karl G. Hempel (1945) famously proposed adequate conditions for confirmation theory, that is, basic principles which every adequate confirmation theory must validate. Among them is SPECIAL CONSEQUENCE CONDITION.\(^7\)

\[
\text{SPECIAL CONSEQUENCE CONDITION (SCC)}
\]

\[
\text{If } (P \Rightarrow Q) \text{ and } (E \text{ confirms } P), \text{ then } E \text{ confirms } Q.
\]

[Hempel (1945), p. 103, Huber (2008), p. 183]

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\(^7\) Hempel’s other adequacy conditions include ENTAILMENT CONDITION ‘If \(P \Rightarrow Q\) then \(P\) confirms \(Q\)’ and SPECIAL CONSISTENCY CONDITION ‘If \((E \text{ confirms } P)\) and \((P\text{ and } Q\) is logically incompatible) then \(E\) does not confirm \(Q\)’ [Hempel (1945), p. 103].
According to SSC, if something is confirmed, then its logical consequence is also confirmed. For example, consider a hypothesis that all roses have thorns \( \forall x(Rx \rightarrow Tx) \). The fact that all roses that we have seen have thorns \( E \) may confirm this hypothesis. Then, SCC states that \( E \) also confirms that if a flower in your garden is a rose then it has thorns \( Ra \rightarrow Ta \) because \( \forall x(Rx \rightarrow Tx) \Rightarrow Ra \rightarrow Ta \).

F. Huber (2008) succinctly sums up the idea behind SCC: ‘a sentence is more plausible the fewer possibilities it excludes, i.e., the more possibilities it includes. Hence, the logically weaker a sentence, the more plausible it is.’

Now, to have evidence \( E \) for \( P \) is to have reason to believe \( P \). Suppose a subject \( S \) believes \( E \) and \( S \) knows that \( S \) has reason to believe \( P \). If \( S \) also bases her belief that \( Q \) on \( P \), SCC tells us that \( S \) also has reason to believe \( Q \).

The second area I will investigate is epistemology, where we find a similar principle called epistemic closure. Epistemic closure of some kind is widely endorsed by epistemologists. The basic idea behind epistemic closure is that we can extend our knowledge or justified belief by logic. Suppose you know that the tree in my garden is a rose and all roses have thorns. Then, you may also know that the tree in my garden has thorns.

In the simplest form, one might formulate KNOWLEDGE CLOSURE as follows:

**KNOWLEDGE CLOSURE?**

If \( (P \Rightarrow Q) \) and \( (S \text{ knows that } P) \), then \( S \text{ knows that } Q \).

Though this is simple and clear, there are strong reasons to doubt it. First, most obviously, we do not believe all logical consequences of our knowledge. If the above principle were correct, we would believe all theorems of, say, Zermelo-Fraenkel set theory. But this is absurd, for there are too many theorems of set theory to be believed by finite beings like us [cf. Harman (1986), p. 14]. Second, even if we actually believe logical consequences of our knowledge, it may be because we are just guessing them without basing our beliefs on our knowledge. But to know or to be justified in believing logical consequences of our knowledge, we need to deduce them from our knowledge. To accommodate these considerations, we must formulate KNOWLEDGE CLOSURE as follows:

**KNOWLEDGE CLOSURE (KC)**

If \( (P \Rightarrow Q) \) and \( (S \text{ knows that } P) \) and \( (S \text{ competently deduces that } Q \text{ from } P) \), thereby forming a
belief that $Q$ on this basis while retaining S’s knowledge), then S knows that $Q$.


Now, part of reason why KC holds must be that, if we are justified in believing something, then we may be justified further in believing its consequence by deducing it. Since it seems that justification is a matter of epistemic reason, KC in turn indicates the following principle about epistemic reason:

**Reason Closure (RC)**

If ($P \Rightarrow Q$) and (S has reason to believe that $P$) and (S competently deduces that $Q$ from $P$, thereby forming a belief that $Q$ on this basis while retaining S’s belief that $P$), then S has reason to believe that $Q$.

Note that RC is nothing but a sophisticated version of the principle that we encountered when exploring confirmation theory. Thus, RC is indicated by different theories outside philosophy of logic. To test RC, let us consider central objections to bridge principles and see if RC can avoid them.

### 2.2 Testing Reason Closure

First, let us consider Steinberger’s objection. Florian Steinberger rejected a bridge principle called Br+, which looks similar to RC, in the following way [Steinberger (2016a), pp. 414–415]. The principle Br+ states that, given $P_0, P_1, …, P_n \Rightarrow Q$, if S has reason to believe $P_0$, S has reason to believe $P_1, …, and S has reason to believe $P_n$, then S has reason to believe $Q$. Now, Steinberger construed having reason to believe $P$ as P’s subjective probability’s being over a threshold ($Pr(P) > t$). Since $P_1 \wedge … \wedge P_n$ is a logical consequence of $P_1, …, P_n$, Br+ is dubious for the following reason:

Given a threshold expressed in the form of a real number $t$ in the unit interval, we can easily conceive of scenarios in which each member of a set of propositions \{P_1, …, P_n\} exceeds the threshold ($Pr(P_i) > t$, where 1 $\leq i \leq n$), but where the conjunction of the propositions in question fails to do so ($Pr(P_1 \wedge … \wedge P_n) > t$).

For example, let $P_i$ be the proposition that $i$ isn’t a winning ticket. Given that the lottery contains $n$ tickets and one of them is a winning ticket, even if $Pr(P_i) > t$, $Pr(P_1 \wedge … \wedge P_n) = 0$.

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10 This assumption may be jettisoned by externalist philosophers.
11 Equating reason with warrant, we would notice RC is warrant transmission, famously rejected by Wright (1985) and (2004). For a convincing criticism of Wright’s view, see Silins (2003) and Pryor (2013).
12 For a nice survey of objections, see Steinberger (2016b), Section 3.1.
13 This follows MacFarlane’s nomenclature [MacFarlane (2004)].
Let us, for the sake of argument, put aside the question of whether Steinberger’s construal of reason to believe $P$ is correct.\textsuperscript{14} It is easy to see why RC is immune to Steinberger’s objection. Note that, in RC, one is allowed to use only one premise in deduction. Suppose $P \Rightarrow Q$. Then, since $Pr(Q) \geq Pr(P)$ if $Pr(P) > t$, then $Pr(Q) > t$. Thus, RC is not only consistent with, but also supported by Steinberger’s construal.\textsuperscript{15,16} 

Second, consider Broome’s objection we have seen in Section 1. In contrast to the principle rejected there, RC doesn’t have the conclusion that when John believes $0 = 1$, he has reason to believe $0 = 1$. This because RC requires us to have reason to believe a premise in order to obtain reason to believe its consequence. Since John has no prior reason to believe $0 = 1$, he will not obtain reason to believe it even deducting it from itself.

Third, consider Harman’s objection from clutter avoidance:

Many trivial things are implied by one’s view which it would be worse than pointless to add to what one believes. For example, if one believes $P$, one’s view trivially implies “either $P$ or $Q$”, “either $P$ or $P$”, “$P$ and either $P$ or $Q$”, and so on. There is no point in cluttering one’s mind with all these propositions. [Harman (1986), p. 12]

Though this objection applies to the bridge principle considered in Section 1, RC is immune to this

\begin{itemize}
  \item We will see another construal of having reason which is based on Bayesianism in note 29.
  \item The question of whether multiple premises should be allowed for REASON CLOSURE is a subtle issue. Though any probabilistic construal of having reason to believe seems to prohibit multiple premises, given that we sometimes extend our epistemic justification by using multiple premises, such construal is unmotivated. In Section 4, I will distinguish between pro tanto reason and all-things-considered reason. At least for all-things-considered reason, it seems, REASON CLOSURE should allow for multiple premises. Thus, the following seems correct:
  \item **ALL-THINGS-CONSIDERED REASON CLOSURE FOR MULTIPLE PREMISES**
  \begin{align*}
  \text{If } (P_0, P_1, \ldots, P_n \Rightarrow Q), \quad \text{(S has all-things-considered reason to believe that } P_0), \quad \text{(S has all-things-considered reason to believe that } P_1), \quad \ldots, \quad \text{(S has all-things-considered reason to believe that } P_n), \\
  \text{and (S competently deduces that } Q \text{ from } P_0, P_1, \ldots, P_n, \text{ thereby forming a belief that } Q \text{ on this basis while retaining S’s belief that } P_0, P_1, \ldots, P_n), \text{ then S has all-things-considered to believe that } Q.
  \end{align*}
\end{itemize}

The question becomes more difficult for pro tanto reason. I am inclined to allow multiple premises also for PRO TANTO REASON CLOSURE. This is because, although a probabilistic consideration (to the extent that $Pr(P)$ is very high) seems to give pro tanto reason to have a partial belief that $P$, it seems that it never gives us pro tanto reason to have a full belief that $P$. (But it may give us pro tanto reason to have a full belief that $Pr(P)$ is very high.) Since REASON CLOSURE is intended to be about full beliefs, no probabilistic construal seems legitimate. Though the question is interesting and important, I will not consider it further in this paper. [For bridge principles for partial beliefs, see Field (2017).] \textsuperscript{16}

There is another difference between Br$^+$ and RC. While RC requires us to deduce $Q$ from $P$ in order to have reason to believe $Q$, Br$^+$ doesn’t. This in turn indicates another important difference: while Br$^+$ is a synchronic principle, RC is a diachronic principle in the sense that it refers to at least two points of time (the time before deduction and the time after deduction). (MacFarlane (2004) seems to be considering only synchronic principles.) The point that RC is diachronic becomes important for our discussion of a normative argument. See Section 4.2.
consideration. According to RC, when we deduce \( Q \) from \( P \), we acquire reason to believe \( Q \). But RC doesn’t require us to deduce \( Q \) even if we have reason to believe \( P \). In particular, RC doesn’t require us to derive trivial consequences.

To recapitulate, RC has the following virtues. First, RC has its relatives in confirmation theory and epistemology. In particular, RC is closely connected to KC, which is widely endorsed by epistemologists. Second, RC is immune to Steinberger’s objection, because RC says nothing about consequences of multiple premises. Third, RC is also immune to Broome’s objection, because RC requires us to have reason to believe a premise in order to have reason to believe its consequence. Forth, RC avoids Harman’s objection from clutter avoidance, because RC itself doesn’t require us to deduce anything. For these reasons, I claim that RC is correct.

3. Deflationary Theory of Truth, Liar Paradox, and the Normative Argument

In this section, I will present a normative argument based on RC. Unlike the bridge principles rejected by Broome’s objection, RC requires us to have reason to believe \( P \) in order to have reason to believe its logical consequence \( Q \). As such, to construct a normative argument, we must find out a proposition \( P \) such that we have reason to believe \( P \), but \( P \) has a logical consequence that we have no reason to believe. For this purpose, let me first briefly introduce deflationary theory of truth, on which, in addition to RC, the argument I propose is based.

As Leon Horsten says, deflationary theory of truth is ‘the most popular theory of truth these days’ [Horsten (2011), p. 59]. According to deflationary theory, the concept of truth is not substantial as traditional theories (e.g., correspondence theory and coherence theory) have taken to be. Truth should be identified with neither ‘correspondence with reality’ nor ‘coherence’. Indeed, the meaning of the truth predicate ‘is true’ (‘\( Tr^* \)’) is completely exhausted by a principle like Tarski schema: \( Tr(<P>) \leftrightarrow P \) [cf. Tarski (1986a)\(^{17} \)] or Intersubstitution Rule: ‘\( Tr(<P>) \)’ and ‘\( P \)’ are intersubstitutable in all contexts [Field (2008), p. 12, Beall (2009), p.1]. Such principles are ‘everything there is to be said about truth’ [Williams (1988), p. 424]. Deflationists take instances of Tarski schema (called Tarski biconditionals) as defining the concept of truth [Horwich (1999), pp. 36–37]. That is, its instances like ‘\( Tr(<\text{Snow is white}> ) \leftrightarrow \text{snow is white} \)’, ‘\( Tr(<\text{grass is green}> ) \leftrightarrow \text{grass is green} \)’, and so forth jointly define the concept of truth.\(^{19} \) As such, there are no substantial component in the concept of truth.\(^{20} \) The truth predicate is like logical connectives such as ‘and’ and ‘not’ [Field (1999),

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\(^{17} \) Since Tarski himself thought that natural languages are semantically closed and inconsistent, he thought we must reintroduce a truth predicate be defining it after distinguishing an object language to which the truth predicate is applied and a metalanguage in which it is applied.

\(^{18} \) Except for opaque contexts.

\(^{19} \) The idea that each Tarski biconditional is a partial definition of the concept of truth derives from Tarski. See Tarski (1986a), p. 187 and p. 236.

\(^{20} \) But why do we need truth predicate then? Just as we need other concept for expression of general facts,
In this paper, I will assume UNRESTRICTED DEFLATIONISM and see whether UNRESTRICTED DEFLATIONISM and REASON CLOSURE lead us to rejection of EXPLOSION. ¹¹

Why does UNRESTRICTED DEFLATIONISM matter to our discussion? This is because UNRESTRICTED DEFLATIONISM holds that, for example, instances of Tarski Schema are logical. Thus, for any \( P, \text{Tr}(<P>) \) logically entails \( P \) and, conversely, \( P \) logically entails \( \text{Tr}(<P>) \). Notoriously, these unrestricted principles cause the liar paradox. Let \( L \) be a sentence such that \( L \) is equivalent to \( \sim \text{Tr}(<L>) \). (Consider ‘This sentence isn’t true’, for example.) There is such a sentence in a language as long as it is semantically closed, that is, it contains, in addition to its expressions, also the names of these expressions, as well as semantic terms such as the term ‘true’ [Tarski (1944), p. 348]. Since our language looks semantically closed and thus contains \( L \) such that \( L \leftrightarrow \sim \text{Tr}(<L>) \) ²²

we need an appropriate truth predicate for generalization [See e.g. Horwich (1999), Field (2008)]. First, we can use a truth predicate for blind ascription. Using a truth predicate, we can say, for example, ‘Everything Virginia Woolf wrote in her essay “On Being III” is true.’ Without a truth predicate, we cannot express the same thing when we don’t know what Woolf wrote in the essay. Second, we can use a truth predicate to express infinite conjunction. Given a truth predicate, we can say, for example, ‘every sentence of the form \( \varphi \to \varphi \) is true’. We may take this as an equivalent of infinite conjunction of \( P \to P, Q \to Q, R \to R \), and so forth ad infinitum.

¹¹ To defend classical logic, one may offer classical axiomatic theories of truth which one way or the other restrict Tarski Schema and Intersubstitution Rule [for classical axiomatic theories, see Halbach (2015), Part III]. In my view, deflationists should not take these axiomatic theories as description of principles ruling use of a truth predicate in our present language, since these theories are either too complex or too restricted to be regarded as such. Instead, axiomatic theories should be regarded as plans for revision of principles ruling its use.

The point is related to deflationists’ rejection of the thesis that truth is substantial. I take the substantiality thesis to be the claim that a property, if any, referred to by a truth predicate is natural to some degree in the sense that Lewis (1983) explicated. As such, deflationists must claim that, even though a truth predicate may have its own extension, its reference is not a natural property. Now, if truth had complex nature as complex theories like classical axiomatic theories describe, it would be natural to say that truth is substantial in this sense. Such complexity of nature of truth would be no more surprise than complexity of nature of particles physical theories describe. However, if meaning of a truth predicate is completely determined by principles ruling its use, complexity of theories of truth becomes problematic. This is not because simple theories are ceteris paribus better explanation in general, but because it is highly unlikely that complex rules have been introduced to our linguistic community without any explicit conventions and each member of it has leaned such complex rules without being explicitly taught. (It is true that rules like laws in a legal system are complex to the extent that we need lawyers. But laws are more or less explicitly stated.) Since there has been no such explicit convention on truth, if meaning of a truth predicate is completely determined by its rules, the rules must be simple at least as rules of logical connectives are. Thus, if truth is insubstantial as deflationists take to be, they should take unrestricted Tarski Schema or unrestricted Intersubstitution Rule to be meaning-determining rules.

By saying this, I am virtually committing to so-called inconsistency theory of truth [see Burgess and Burgess (2011) and Eklund (2002)]. Since classical logic and unrestricted Intersubstitution Rule are inconsistent, to take both of them as meaning-determining rules is to regard our language as inconsistent as inconsistent theorists would say. In this paper, I will not directly argue for inconsistency theory, though rejection of normative arguments may contribute for it.


p. 534] in that its meaning is determined by basic principles ruling its use. Call the claim that unrestricted principles such as Tarski Schema and Intersubstitution Rule determine the meaning of the truth predicate UNRESTRICTED DEFLATIONISM. In this paper, I will assume UNRESTRICTED DEFLATIONISM and see whether UNRESTRICTED DEFLATIONISM and REASON CLOSURE lead us to rejection of EXPLOSION. ²¹

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we have reason to believe that $L \leftrightarrow \neg \text{Tr}(L)$. By substituting ‘$\text{Tr}(L)$’ for ‘$L$’ (or by using $L \leftrightarrow \text{Tr}(L)$), we obtain

$$\text{Tr}(L) \leftrightarrow \neg \text{Tr}(L).$$

From this, it follows that

$$\text{Tr}(L) \& \neg \text{Tr}(L).$$

From this, we can derive a proposition that we have no reason to believe. For example, we have no reason to believe that the number of birds in this universe is odd now. Call this proposition BIRD. By EXPLOSION, BIRD follows from $\text{Tr}(L) \& \neg \text{Tr}(L)$. Thus, $L \leftrightarrow \neg \text{Tr}(L) \Rightarrow \text{BIRD}$. (Note that, to claim $L \leftrightarrow \neg \text{Tr}(L) \Rightarrow \text{BIRD}$, we need not only EXPLOSION, but also UNRESTRICTED DEFLATIONISM.)

Based on this, we can construct a normative argument as follows. Since our language seems semantically closed, S has reason to believe that $L \leftrightarrow \neg \text{Tr}(L)$. Suppose S deduces BIRD from the belief that $L \leftrightarrow \neg \text{Tr}(L)$, thereby coming to believe BIRD. Then, by REASON CLOSURE, it follows that S has reason to believe BIRD. But this conclusion is absurd. We should not endorse this method of ‘indoor ornithology’. Since all other assumptions seem plausible, we should reject EXPLOSION.

4. Pro Tanto Reason and All-Things-Considered Reason: Defense of Classical Logic

UNRESTRICTED DEFLATIONISM, EXPLOSION, and REASON CLOSURE apparently lead to the absurd conclusion that one has reason to believe BIRD. The normative argument concludes that EXPLOSION should be rejected. Can we defend classical logic?

To answer this question, we need to look deeper into the nature of reason that appeared in REASON CLOSURE. So far, we haven’t distinguished between pro tanto reason and all-things-considered reason. Pro tanto reasons to believe $P$ are considerations which count in favor of $P$, though pro tanto reasons may be either undermined or opposed by other considerations. (Pro tanto reasons to believe

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23 In general, to show $P \leftrightarrow \neg \neg P \Rightarrow P \& \neg \neg P$, we need other assumptions. For example, in logics formalized in a sequent style, we need structural rules such as left weakening and left contraction besides introduction rules of negation and conditional. There are logics, called substructural logics, which lack such structural rules. [For a nice survey of many substructural logics, see Restall (2000).] In this paper, I set aside issues concerning legitimacy of structural rules. [See Beall et al. (2018), chap. 7 for substructural theories of truth.]

24 This is of course to be distinguished from another method of ‘indoor ornithology’ opened by Hempel’s raven paradox.

25 Notice that this argument does not assume that $L \leftrightarrow \neg \text{Tr}(L)$. As such, according to the argument, even if it is not the case that $L \leftrightarrow \neg \text{Tr}(L)$, we have reason to believe that $L \leftrightarrow \neg \text{Tr}(L)$.}
$P$ are undermined by other considerations when the pro tanto reasons are made to count less in favor of $P$ by these other considerations. Pro tanto reasons to believe $P$ are opposed by other considerations when these other considerations count in favor of what is incompatible with $P$. In contrast, all-things-considered reasons to believe $P$ are considerations which count in favor of $P$ all things considered. (Note that all-thing-considered reason are still fallible.) Based on this distinction, we can formulate two versions of reason closure: PRO TANTO REASON CLOSURE and ALL-THINGS-CONSIDERED REASON CLOSURE. I will examine and reject each of the normative arguments based on them.

4.1 Normative Argument based on PRO TANTO REASON CLOSURE

First, let us consider PRO TANTO REASON CLOSURE:

PRO TANTO REASON CLOSURE (PRO TANTO RC)

If $(P \Rightarrow Q)$ and (S has pro tanto reason to believe that $P$) and (S competently deduces that $Q$ from $P$, thereby forming a belief that $Q$ on this basis while retaining S’s belief that $P$), then S has pro tanto reason to believe that $Q$.

Since we have pro tanto reason to believe that $L \leftrightarrow \sim Tr(<L>)$, when we deduce BIRD from this belief, we also have pro tanto reason to believe BIRD. Since there appears no such reason, one might argue that we should reject EXPLOSION.

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27 Dialetheists may say there is $P$ such that $P$ and $\sim P$ are not incompatible, that is, it is possible that $P \& \sim P$. But even dialetheists would not say, e.g., that BIRD and $\sim$BIRD are compatible.
28 One might object to PRO TANTO RC on the basis of a Bayesian-confirmation-theoretic consideration. Confirmation theorists distinguish two notions of confirmation [Crupi and Tentori (2016), p. 651, Huber (2008), p. 184]. The first is absolute confirmation. An evidence $E$ absolutely confirms $H$ if and only if $Pr(E | H) > r$, where $r \geq 1/2$. (Note that since absoluteness thus defined means neither certainty nor indefeasibility, pro tanto reason may be construed as absolute confirmation.) The second is incremental confirmation. An evidence $E$ incrementally confirms $H$ if and only if $Pr(E | H) > Pr(H)$. While absolute confirmation meets Special Consequence Condition, incremental confirmation doesn't [Carnap (1962), pp. 476–477, Huber (2008), pp. 182–183]. To see this, consider the following example:

Let $H_1$ be “the card drawn is a red non-face card” and let $H_2$ be “the card drawn is a non-face card,” so that $H_1$ implies $H_2$. If the evidence $E$ is provided that the card drawn is actually red, then it seems natural to observe that $H_1$, but not $H_2$, receives support, and is thereby confirmed. [Crupi and Tentori (2016), p. 652]

Thus, if S’s obtaining pro tanto reason to believe $P$ is identified with $P$’s being incrementally confirmed, then we should reject PRO TANTO RC.

Though the example above may show something important about pro tanto reason, it is not clear why we should say that pro tanto reason is incremental confirmation. Is the evidence $E$ that the card drawn is red is pro tanto reason to believe $H_1$? If not, the example cannot be used as a counterexample of RC.
Classicists may bite the bullet. Classicists can explain why there appears to be no reason to believe BIRD despite the existence of pro tanto reason to believe BIRD. The reason is not that we don’t have any pro tanto reason to believe BIRD, but that we also have pro tanto reason to believe ~BIRD. That is, if we have pro tanto reason to believe BIRD, by parity of reasoning, we have opposing pro tanto reason which counts in favor of the alternative hypothesis ~BIRD, since \( L \leftrightarrow \sim Tr(<L>) \) logically entails not only BIRD, but also ~BIRD. After all, the reason given by deduction through contradictions does not discriminate a hypothesis and its alternative hypothesis. Therefore, we don’t have all-things-considered reason to believe BIRD. This is why it appears that we have no reason to believe BIRD. Thus, we can defend classical logic against the normative argument based on PRO TANTO RC.

### 4.2 Normative Argument based on ALL-THINGS-CONSIDERED REASON CLOSURE

Second, let us consider ALL-THINGS-CONSIDERED REASON CLOSURE:

**ALL-THINGS-CONSIDERED REASON CLOSURE (ALL-THINGS-CONSIDERED RC)**

If \( (P \Rightarrow Q) \) and \( (S \text{ has all-things-considered reason to believe that } P) \) and (S competently deduces that \( Q \) from \( P \), thereby forming a belief that \( Q \) on this basis while retaining S’s belief that \( P \)), then \( S \) has all-things-considered reason to believe that \( Q \).

Based on ALL-THINGS-CONSIDERED RC, one might argue as follows. We have all-things-considered reason to believe that \( L \leftrightarrow \sim Tr(<L>) \). Suppose we deduce BIRD from \( L \leftrightarrow \sim Tr(<L>) \). Then, by ALL-THINGS-CONSIDERED RC, we would have all-things-considered reason to believe BIRD. But this is absurd. So, EXPLOSION should be rejected.

We may object that we may not have all-things-considered reason to believe \( L \leftrightarrow \sim Tr(<L>) \). This is because when we consider whether we have all-things-considered reason to believe \( P \), we should take wide range of reasons into consideration, including \( P \)'s logical consequences [cf. Harman (1986), p. 5]. Since \( L \leftrightarrow \sim Tr(<L>) \) entails not only BIRD, but also a clearly false proposition like \( 0 = 1 \), we may take this as a consideration against believing it. Thus, all-things-considered, we may not have reason to believe \( L \leftrightarrow \sim Tr(<L>) \).

However, a paraconsistent logician might argue that, after all, the reason that our language seems semantically closed is so strong that we have all-things-considered reason to believe \( L \leftrightarrow \sim Tr(<L>) \).

Let’s assume, for the sake of argument, that we have all-things-considered reason to believe that \( L \leftrightarrow \sim Tr(<L>) \). Even under this assumption, I will argue, classicists can reply to the argument. Recall that RC requires S to deduce and come to believe BIRD in order that he can have reason to believe BIRD. But do we really come to believe BIRD in this way? Chihara says we don’t:
“real life” inference, whereby one concludes something as a result of an intellectual process of reasoning and assessment, is a more complex matter than is suggested by standard texts in classical deductive logic: in “real life” situations, one doesn’t simply accept blindly the logical consequences of whatever one may initially have reason to believe. [Chihara (1984), p. 226]

Since we don’t infer BIRD in “real life” situations, we don’t have reason to believe BIRD. However, even though it is highly unlikely in “real life” situations, but it’s not impossible that one infers in the problematic way. In so far as he doesn’t come to believe BIRD, he doesn’t have all-things-considered reason to believe BIRD. But once he has done so, he would obtain all-things-considered reason to believe BIRD.

The situation is not so bad for classicists as it first appears. This is because norms like reasons and obligations may change over time. To see this, consider the following example that Forrester (1993) used to object to the standard deontic logic. We must not kill anyone. But, if we kill anyone, we must kill him as gently as possible because violent murders are much worse than gentle murders. Thus, if Pavel kills Fedor, then Pavel must kill him gently. Suppose Pavel actually kills Fedor. By modus ponens, it follows that Pavel must kill him gently. While Pavel must not kill Fedor before the time of his murder, once it is determined that Pavel kills Fedor, it becomes obligatory that Pavel kills him gently.

Likewise, even though one doesn’t have all-things-considered reason to believe BIRD until he infers it from $L \leftrightarrow \neg Tr(<L>)$, as soon as he infers it, he will obtain all-things-considered reason to believe BIRD. However, just as Pavel’s obligation to gently kill Fedor originates from Pavel’s immoral action rather than general moral norms, his having reason to believe BIRD originates from his unwise deduction rather than general epistemic norms like RC. After all, he had no reason to deduce in the way S did.

5. Conclusion

In this paper, I have defended the bridge principle REASON CLOSURE. REASON CLOSURE is not only supported by confirmation-theoretic and epistemological considerations, but also immune to the

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29 One might ask why I don’t say straightforwardly that the correct logic of our language is paraconsistent given that in “real life” situations we don’t use EXPLOSION. The answer is that, even though we may avoid EXPLOSION in “real life” situations, we use DISJUNCTIVE SYLLOGISM, addition of which to a paraconsistent logic like LP allows for EXPLOSION (see note 3). Thus, without being prepared further to claim that we don’t use DISJUNCTIVE SYLLOGISM (or other plausible principles like $\lor$-Introduction) in “real life” situations, one cannot claim that the logic of our language is paraconsistent.

30 In general, we should not say we have reason to infer anytime we can, as Harman’s objection from clatter avoidance tells us. See Section 2.2.
central objections to bridge principles in general. The worry was that, together with deflationary
theory of truth, REASON CLOSURE seems to allow us to construct the normative argument against
EXPLOSION and thus compel us to reject classical logic. However, distinguishing between pro tanto
reason and all-things-considered reason, we can defend classical logic.

Acknowledgement

This work was supported by JSPS KAKENHI Grant Number JP18J14593. I would like to thank
Shohei Takasaki and Takaaki Matsui for their helpful comments on the manuscript of this paper.
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