

THE EPISTEMIC INJUSTICE OF *EX CONTRADICTIONE QUODLIBET*

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The principle of *ex contradictione quodlibet* stipulates that from contradiction, all propositions follow. From this, all explode into triviality; hence, the aversion towards contradiction. However, our social selves are mired with inconsistency and contradictions and identities built on a spectrum. The assumption of triviality from contradiction in formal logic makes it such that the contradictions found within natural language on our social identities equally trivializes those contradictory aspects, and thereby, inflicts an epistemic injustice.

I argue that if natural language is to be formalized, then there exists a moral imperative to defer to paraconsistent logic, specifically in cases of linguistic inconsistency relevant to aspects of social identity. The conditionality of the claim proves important: I do not defend the assertion that natural language *can* be formalized—that is a philosophical and technical anthology in its own right. Rather, I would like to undertake the normative project of highlighting what I take to be a necessary condition for the formalization of natural language. The argument is as follows: the rejection of inconsistency denies the expression of social experiences lying outside the binary. It presupposes a singularity of social experience, and in assuming this, inflicts epistemic injustice. To a further extent, this jeopardizes social justice and political freedom via its hindrance to the dialogical basis of democracy. In its acceptance of inconsistency without triviality, we ought to accept paraconsistent logic, understood under a larger framework of logical pluralism, as a strong antidote to the harms outlined above.

The urgency of this demand emerges from the significant overlap between formal and Boolean logic with the implications of the former largely carrying over to the latter. The premises of big data and artificial intelligence, grounded in Boolean logic, have their linguistics subsumed under natural language processing (and thereby formal logic). This trend persists even as developments in the field have shifted from rule-based algorithms to statistical models and vector representations. Through its adoption of formal logic's views on inconsistency, the future of technology has then rendered itself vulnerable to these aforementioned harms, and by way of algorithmic learning, will only experience its problems perpetuated and compounded further.

The essay begins in §I with an introduction of epistemic injustice and its associated harms, of which I specifically focus on illocutionary silencing. With these conceptual resources, §II demonstrates how the assumption of triviality as a consequence of contradiction inflicts epistemic injustice in the form of illocutionary silencing. §III continues by offering a positive solution in the form of paraconsistent logic, and though accounts of this form of logic are wildly disparate—tied only by the common thread of non-explosion—I believe that this one thread is a moral commitment necessary to make.

§I Epistemic Injustice

Introduced by Miranda Fricker (2007), epistemic injustice is an injustice arising from dissimilarities in individual and collective epistemic resources. Fricker then proceeds to divide this into two camps: testimonial and hermeneutical injustice.

1. *Testimonial Injustice*: “wherein a speaker receives an unfair deficit or credibility from a hearer owing to prejudice on the hearer’s part.” (Fricker 2007, 9)

Patricia Williams, a professor at Columbia University Law School, demonstrates a paradigmatic case of this in her book *The Alchemy of Right and Race*, wherein she recounts a personal, anti-black, racist experience. Yet, upon retelling this event, she would often disbelieve herself—a consequence perhaps in no small part attributable to the prejudicial stereotypes of African Americans as “liars” or “paranoid,” consequently leading Fricker to discern that she has suffered an instance of testimonial injustice.

2. *Hermeneutical Injustice*: “wherein someone has a significant area of their social experience obscured from understanding owing to prejudicial flaws in shared resources for social interpretation.” (Fricker 2007, 148)

Sexual harassment is a common example of this second form of epistemic injustice. Prior to its conceptualization, many of those victimized lacked the epistemic resources

to articulate their experiences, which were then previously rendered unintelligible. Instead, their discomfort would be 'interpreted' as overly prudish or lacking in sense of humor, henceforth exemplifying a hermeneutical injustice.

Of note here is the distinction between hermeneutical and testimonial injustice in the collectivity of epistemology. In the hermeneutical form, the injustice arises from a deficit in the *shared* pool of knowledge, whereas in testimonial form, the injustice may be rooted in a singular repository of it. In the example given for the hermeneutical, society lacks the conceptual resource of sexual harassment itself—an absence that points to a structural and collective inequity in epistemology. Conversely, in the case of testimonial injustice, Williams's example does not causally trace (at least necessarily) to a flaw in a shared resource, but instead, may be attributable to one individual's racist beliefs and attitudes. And still, the two forms are nonetheless deeply intertwined: the hermeneutical may lead to the testimonial and the testimonial may be a manifestation of the hermeneutical. What follows from these injustices are harms of both an epistemic and pragmatic nature. The excerpt below focuses on one harm of illocutionary silencing, as proffered by Rae Langston:

"If you are powerful, you sometimes have the ability to silence the speech of the powerless. One way might be to stop the powerless from speaking at all. Gag them, threaten them, condemn them to solitary confinement. But there is another, less dramatic but equally effective way. Let them speak. Let them say whatever they like to whomever they like, but stop that speech from counting as an action..." (Langston 1993, 299)

Illocutionary silencing is the refusal to admit a proposition's illocutionary force, or that which is constituted by the words themselves.¹ It nullifies the performative force of the words, disallowing the utterances from passing on their intended meaning, thus following from epistemic injustice's emerging inequities. In the case of Williams, her attempt to describe this racist encounter was negated—her words stripped of their force in invoking a case of discrimination. Similarly, the inability to articulate a grammar for sexual harassment may count as a form of silencing insofar its conceptual deficit precludes the description of the experience. Furthermore, the reactions to circumlocutionary attempts to do so effectively impedes the victims' ability to promulgate those experiences, and resultingly, commits the injustice (whether testimonial or hermeneutical) all the same.

To conclude, epistemic injustice is the sort of injustice that emerges from differences in epistemic stature. For the remainder of this paper, I use this as the pedagogical framework to make sense of the injustice enacted by classical formal logic and its insistence on consistency.

¹ For more on this, see Austin's *How to Do Things With Words* (1962)

§II *Ex Contradictione Quodlibet's* Epistemic Injustice

In a keynote lecture delivered at the 8th Annual Philadelphia Trans-Health Conference in 2009, writer and trans-bi activist Julia Serano stated, “[t]here is simply no more effective way of hurting me than trans-invalidating me.” In what follows, I argue that the consequence of triviality from contradiction clears the path to such harms of invalidation through its enactment of epistemic injustice.

But first, a brief note on the specifics of *ex contradictione quodlibet*. While the path from contradiction to triviality may differ, one such form famously derived by David Lewis takes the following structure:

“Suppose	P and not-P	
Then	P	by Simplification,
whence	P or Q	by Addition,
	not-P	by Simplification again,
and finally	Q	by Disjunctive Syllogism.”

According to this argument, any statement *Q* follows from the premise of *P and not P*. Some may object to this proof in that entailment needs to do more work than simply truth-preservation: it also needs to retain some meaningful connection or relevance between the two propositional statements. Regardless of how one argues *ex contradictione quodlibet*, the central point remains: contradiction explodes into triviality.

It is important to take note of what the definition and consequences of what it means to be trivial, the first of which being that triviality could be taken as entailing everything. This, however, draws from the principle of *ex contradiction quodlibet*, proving to be circular reasoning at best, and because of this, cannot be taken freely as the definition. Second, triviality is that which is uninteresting or insignificant. Essential to this definition is the assumed goal of logic and epistemology to uncover truths, or, at the very least, proximate truths about the world. There are certain propositions more interesting than others and the rejection of contradiction from *ex contradictione quodlibet* implies the undesirability of triviality. For the remainder of this paper, I adopt this latter definition.

Having adopted this understanding of triviality as ‘that which is uninteresting or insignificant,’ it is now possible to move on to the discussion of inconsistency’s intertwinement with epistemic injustice—beginning with an example of gender queerness. Consider the following statement:

(A) I am a girl.

(B) I am not a girl.

Let’s say that Alex utters these two statements in response to a question asking them to identify their gender. Alex identifies as genderqueer.² To them, both (A) and (B) are true.³ Given how they identify, Alex is both a girl *and* not a girl.

By formal logic’s adoption of *ex contradictione quodlibet*, however, Alex’s utterances make it such that each and every statement can follow. They are all trivial, and thus, devoid of importance. From this, epistemic injustice then enters into the picture. With their speech now made trivial, Alex’s credibility as a knower and their ability to make significant contributions to the conversation on genderqueerness is cast out, thereby constituting a case of testimonial injustice. It is also arguable that Alex also experiences hermeneutical injustice since the mutually exclusive gender binary does not provide the conceptual resource to capture Alex’s experience of gender, and on this count, their social experiences are effectively obscured.

The path to illocutionary silencing is not far off. In this case, Alex’s illocutionary act is the very proclamation of their gender identity as a girl and not a girl. In keeping with *ex contradictione quodlibet* and its aversion towards triviality, only one of these two statements can be true, which of course has the negative consequence of disallowing their entire illocutionary force. By having their proclamation fall upon deaf ears, Alex experiences both testimonial and hermeneutical injustice, and thus, becomes silenced.

Despite however much the act of silencing in itself is negative, the scope of these harms extends even further with repercussions for both social justice and political freedom. Concerning social justice, when one silences the speech of the powerless, they favor a specific form of discourse—that of the powerful. This perpetuates the further marginalization of the powerless through the determination of what sort of gender proves significant, which nullifies Alex’s own words as unimportant given their contradiction. On this account, epistemic injustice is a manifestation

² This is understood in the sense that their gender identities are maintained by some combination of masculinity and femininity, or neither.

³ For the remainder of this paper, I will assume Alex identifies themselves using the pronouns “they/them/theirs.” It may change, of course, and this is by no means an assumption that all genderqueer people need use such pronouns.

of social injustice stemming from the rendering of the powerless as the speechless. Furthermore, taken as a collective, the experiences of all those who identify as genderqueer are similarly silenced, paving the way for injustice to affect an entire social class of people like Alex.

Concerning political freedom, Fricker makes this a point in referencing Phillip Petit's contestability criterion. He states that a functioning deliberative democracy needs to meet the three conditions for contestation, which include: a "potential basis for contestation," a "channel or void available by which decisions may be contested," and a "suitable forum in existence for hearing contestations."⁴ Being illocutionary silenced, however, disables speakers from contestation. Because Alex's identity was not taken as it was intended in meaning, the immediate jump to the consequence of triviality as stipulated by *ex contradictione quodlibet* strips Alex of their ability to contest this conclusion. From this, they are excluded from securing a certain threshold of political freedom, which Petit stipulates as necessary for a deliberative democracy.

What does this mean for technology?

Returning to my original motivation, the basis of this paper resides in the substantial overlap between formal logic and the logic underlying computer science and artificial intelligence. It is this overlap and the permeation of technology into nearly every crevice of our lives that lends an urgency to my demand to attempt a rectification, or at the very least, acknowledgment of the inflicted epistemic injustice of *ex contradictione quodlibet*. In particular, by accepting formal logic as prior to other epistemic sources, as technology so often does, its stance on contradiction—that triviality necessarily follows—then holds the power to dictate our understanding of the world. By taking the principle as an authority on truth, the ontological may end up following the logical. Our social constructions of the world would be determined by a framework strictly adhering to a dichotomous binary, such that it creates a world where genderqueerness would not exist *a priori*.

In taking into account how the field makes sense of this, it is important to note that recent developments in the field have increasingly shifted from rule-based algorithms to statistical models; in particular, vector semantics have exploded in popularity in building computational models of language.⁵ This largely consists in word association: for example, the definition of the word "bank" is determined depending upon whether the sentence contains words alluding to the likes of "money" or "river." Following this, that the bulk of the two formalized propositions of (A) and (B) are

⁴ Pettit, 186-187.

⁵ For a brief overview on how vector semantics works, see the following: <https://medium.com/@ram.analytics1/introductory-notes-on-vector-semantics-tf-idf-model-and-a-toy-implementation-9046198bf7d> and <https://web.stanford.edu/~jurafsky/li15/lec3.vector.pdf>

identical indicates that they are on the same broad topic of someone being something. Much like the case with many other prepositions and conjunctions, the “not” is not always captured in building the meaning of the proposition.⁶

While negation systems have not become all-around powerful enough to build the meaning of the proposition on their own, the scope of this paper applies to cases on the margins of error where the negation of “not” *is* able to be captured (the choice of which made on account of the fact that the field is headed in that direction). Yet, as I have argued, accommodation of negation in a formal setting leads to instances of epistemic injustice.

§III The Solution: Paraconsistent Logic

To the above, I believe that paraconsistent logic is a strong contestant as a positive solution to the formal infliction of epistemic injustice, its defining characteristic being its rejection of *ex contradictione quodlibet*. Since its inception, a number of influential strands have emerged. For example, among the first was Stanislaw Jaśkowski’s discussive logic, where truthfulness is determined by the totality of assertions posited by a single subject. Graham Priest’s “Logic of Paradox” introduced a three-valued logic, the third being both true and false, and Newton Da Costa presented logics of formal inconsistency (isolating the instances of inconsistency), which has since been expanded upon by many others, such as Walter Carnielli and Marcelo Coniglio. For the remainder of this section, despite citing several of these logics as solutions to the problems of epistemic injustice, I would like to remain indifferent on which of these specifically proves most favorable.

To reiterate, the problem with *ex contradictione quodlibet* is that it assumes Alex’s utterances, technically contradictions in formal logic, do not matter. Priest, however, maintained that inconsistent theories did not necessarily lead to triviality, citing Bohr’s theory of the atom. Alex’s utterances of (A) and (B) are not inconsistent, but from the standpoint of the listener, it would be absurd to argue that this then makes their statements insignificant—if anything, it is the conjunction of the two that makes their speech *especially* relevant.

One might object here, pointing to the goal of logic to approximate the truth. What I have presented may appear as circular in that Alex’s gender identification indicates a non-trivial, but inconsistent theory. Yet, the existence of a non-trivial, but inconsistent theory is also what allows Alex to identify the way that they do. To this,

⁶ For applied progress in the field, see: Mehrabi, Saeed et al. “DEEPEN: A negation detection system for clinical text incorporating dependency relation into NegEx,” *Journal of Biomedical Informatics* 54 (2015): 213-219 and Wu, Stephen et al. “Negation’s Not Solved: Generalizability Versus Optimizability in Clinical Natural Language Processing,” *PLOS One* (2014), accessed from <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0112774>

I take on the assumption that gender identity is something that is self-promulgated rather than externally imposed, well within the right of an individual to proclaim as theirs as it fosters a knowing self-consciousness capable of validating their own experience.⁷

Counter to classical first-order logic, paraconsistent logic can accommodate the contradiction to uphold the significance of Alex's words. For example, the many-valued logics Priest proposed gives space to inconsistent and non-trivial theories. The truth-value of "both true and false" creates a third dimension of truth-evaluation that keeps the relation from exploding into triviality. The consequences of this for Alex are substantial: by not having their words trivialized, their words are therefore legitimized. The admission of inconsistency erases the inherent bias within the traditionally binary logical system that obscures their social experience. This, in turn, deflects the harms of illocutionary silencing and the formal inflictions of testimonial and hermeneutical injustice.

Still, one might consider another potential interpretation of the apparent paradox posed by Alex's utterances of (A) and (B)—namely, what if this is just a matter of language? The epistemic injustice would not be located in the words themselves, but in linguistic conflation. In the case of Alex, one might argue that their utterances of (A) and (B) reflect a variation in the sense of the term "girl" itself, with one being biological and the other social.

While this may be so, the concern assumes a direct causality where thought is prior to language, and hence, the knowledge of two distinguishable senses proves sufficient enough to cast aside this juxtaposition. This, however much it would reconcile the problem, cannot be freely granted. Work in philosophy, linguistics and psychology demonstrates the profound influence of language on thought, whereby some like Donald Davidson, for example, claimed that belief states emerged from public linguistic interaction such that thought and language work in tandem. Psychologist Lera Boroditsky argues further that grammatical gender strongly sways the descriptive attributes of an object,⁸ which when taken with Davidson's thesis, strongly suggests that linguistic resources may affect our cognitive understandings. The same can be said of formal resources: as mentioned earlier, the priority of formal logic may lead to an embedding of the binary into our cognitive framework.

In fact, the linguistic aspect might compound the problem of epistemic injustice in formalized language, not even admitting a difference in the biological and the social senses. By way of the formal properties of the term "girl," the biological sense

⁷ This derives from strands of the Kantian tradition emphasizing self-knowledge and self-conception.

⁸ See: Boroditsky, Lera, "How Does our Language Shape the Way We Think?" accessed from <https://www.edge.org/conversation/how-does-our-language-shape-the-way-we-think>

is inherently conflated with the social, which may result in further iterations of the harm (if not also a further narrowing of the hermeneutical resources).

To this, paraconsistent logic may again play the role of a remedy. Admission of (A) and (B) as contradictory, but non-trivial, allows for both the biological and social senses to hold true. The use of adaptive logics, for example, which offers severance to contact, accounts for internal inconsistency within a single subject. By adapting to different situations, the word “girl” takes on different meanings according to contextual clues and background knowledge, such as Alex’s intentions and the very idea of gender queerness. By this, it allows for both senses to be true, but also admits the term in the same sense with respect to the context of an expanded knowledge of genderqueerness.

I have made the claim that paraconsistent logic offers a fruitful response to the challenges posed to formal logic by inconsistent, but non-trivial theories and linguistics. But it is possible to take the argument even further: not only does paraconsistent logic do such work, but it also proves necessary in order to properly convey meaning in formalized language. All of this is to say that the logic itself must not dictate meaning, but rather that, meaning must lead to its formalization. The fact that inconsistency permeates our world must be reflected in formalized language. Applications of paraconsistent logic are growing in data and knowledge bases (Grant 2000), isolating inconsistent material so as to simultaneously admit the two nodes of inconsistency. However, interest in such must be acted upon for the purpose of retaining meaning and preventing epistemic injustice.

One last point to be made on my argument: formal logic as it applies to natural language fails *normatively*, but not necessarily, formally. From the standpoint of logical argumentation, classical first-order logic does indeed succeed. Furthermore, it must also be noted that it does not inflict epistemic injustice in all cases: when I utter (A) and (B), one is necessarily true and the other necessarily false *on the basis of how I identify my gender identity*. Classical formal logic succeeds in my case. However, its failure to represent Alex’s social experience according to that by which they identify indicates that we *ought* not to take it as an omniscient authority over truth.

The argument I have set forth here is not meant to discredit the standing of formal logic in its entirety, but rather, to elucidate its futility under certain contexts. The claim is meant to provide a normative approach to opening the door to logical pluralism. First-order logic need not be discredited in its totality, but its scope *should* be limited in its application and its position ceded to other logical systems (*viz.* as paraconsistent logic).

Concluding Remarks

In this essay, I have shown that paraconsistent logic serves as a positive solution to the epistemic injustice and associated harms inflicted by classical formal logic in its insistence on *ex contradictione quodlibet*. In particular, because formal logic stipulates a mutually exclusive true-false dichotomy, application of it effectively invalidates speech and information. In cases of genderqueerness, this leads to serious threats in our abilities as epistemic agents as well as in the broader picture of social justice and political freedom. That paraconsistent logic may be a promising logic proves so on account of its acceptance of inconsistency without the consequence of triviality, and its ability to represent the actual character of propositional meaning in a formalized language. As the future of AI is intrinsically bound to formal logic, the consequences of epistemic injustice will only become more evident and tangible lest we adopt some form of paraconsistent logic and adhere to logical pluralism. Accordingly, our fundamental view of formal logic must be tweaked and reevaluated in light of the normative and moral concerns presented previously. ♦

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