Deriving *Even Though* from *Even*[⋆]

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Abstract. This paper explores the semantics of the concessive subordinator *even though* and its relatives. Previous proposals for these subordinators fail to derive the truth conditions compositionally. The proposal presented herein derives the concessive inference of these clauses compositionally, using a standard account of *even*. This further has the effect of relating *even though* to the concessive conditional *even if* as well as a proposal for concessive uses of *still*.

1 Introduction

Concessive clauses are adverbial clauses that express some opposition or general incompatibility between the truth of the matrix clause and the subordinate clause. That is, they indicate that there is something strange, unexpected, or odd in both clauses being true. In English, these clauses are introduced by subordinators like *even though*, *although*, and *though*. These may be illustrated in the following examples:

(1) a. The tree didn't fall even though it was struck by lightning.
b. Although I'm no chef, my turkey came out great.
c. I'm going to go to bed, though I really need to finish this paper.

In general, *even though/although/though p, q* entails that both p and q are true. Further, it carries the inference that there is some general conflict between the two propositions. When there is no apparent incompatibility between the two being true at once, the construction is infelicitous:

(2) (Context: Harry only ever goes on walks when it's not raining.)
Harry went on a walk even though it's not raining out.

Concessive clauses are often connected to causal clauses (e.g. *because*). That is, they are thought to be somehow 'anti-causal' or 'incausal', and this is the line of thinking that most analyses of concessives follow ([11], a.o.). However, concessive clauses are also linked to concessive conditionals (e.g. *even if* in English). Diachronically, the origin of many concessive clauses is the concessive conditional, and it is an overwhelmingly common trend that concessive conditionals become

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true concessives, especially ([12]). This is true for English, where *though* was previously conditional ([11]). It is ideal, then, that an analysis of concessives be related to an analysis of concessive conditionals. In English, an obvious parallel between the concessive conditional *even if* and concessive *even though* can be found in the scalar particle *even*.

In this paper, I will provide an analysis of the concessive conditional *even though* that runs parallel to an analysis of *even if* provided by [6]. This analysis will turn on the scalar particle *even*, which compositionally provides the concessive inference to both concessive conditionals and concessives. Further, such an analysis suggests parallels between concessive conditionals, concessives, and the concessive *still* particle.

2 Previous Analysis of Concessives

The most robust and widely cited analysis of concessive clauses is provided by [11] (henceforth K&S). Their study attempts to describe concessive clauses in relation to causal clauses (e.g. *because*). They claim that there's a general intuition that causal and concessive constructions are related (i.e. they are somehow opposites of one another), and they attempt to support this intuition.

Evidence for this intuition comes from the following pieces of data (Capitalization represents focal accent):

(3) a. John is NOT unhappy because he has lost a lot of money.
b. John is not unhappy because he has lost a lot of MONEY, (but because...)
c. John is not unhappy even though he has lost a lot of money.

The intended reading of (3a) is somewhat marginal. The intonation on (3a) and (3b) is crucial; *not* must receive nuclear accent and everything after this accent must be deaccented. This is opposed to (3b), where there is a fall-rise accent on *money*. Both (3a) and (3b) should be read as having wide-scope negation. They differ in that (3a) entails that John is not unhappy. The sentence in (3b) entails that John IS unhappy, but not for the reason that he has lost a lot of money. K&S (as well as [18]) claim that there is an equivalence (I take it a truth conditional equivalence) between (3a) and (3c), where negation in (3c) has narrow scope, applying only to the matrix clause.

K&S assert that a theory's ability to account for the equivalence (or seeming equivalence) between (3a) and (3c) should be a "criterion of adequacy" for assessing the theory. As such, they propose the following analysis for *because* p, q in (4) and *even though* p, q in (5):

(4) a. because p, q
b. **Presuppositions:** $P \rightarrow Q$; p
c. **Assertion:** $p \wedge q$

(5) a. even though p, q

b. **Presuppositions:** $P \rightarrow \neg Q$; p

c. **Assertion:** $p \wedge q$

The presuppositions $P \rightarrow Q$ and $P \rightarrow \neg Q$ in (4b), (5b) are "generalizations" of p and q. If these were not generalizations, the asserted content would contradict the presuppositions (i.e. if (5b) were about just the particulars p and q, (5c) together with (5b) entails the contradiction $q \wedge \neg q$). For example, the presupposition in (3c) means something like: "normally, when someone loses a lot of money, they are unhappy." To derive the supposed equivalence between (3a) and (3c), they calculate the meanings as follows, where (3a) and (3c) are represented schematically as (6a) and (7a) respectively:

(6) a. $\neg(\text{because } p, q)$

b. **Presuppositions:** $P \rightarrow Q$; p

c. **Assertion:** $\neg(p \wedge q) \quad (= \neg p \vee \neg q)$

d. $p \wedge \neg q$ (p is presupposed)

(7) a. even though p, $\neg q$

b. **Presuppositions:** $P \rightarrow Q$; p

c. **Assertion:** $p \wedge \neg q$

d. $p \wedge \neg q$

However, their view of the relationship between *because* and *even though* is not without issue. First, the causal notion of *because* is (obviously) crucial to an analysis of *because*, but not for *even though*. It is possible to construct wide scope (as in (3a)) readings of causal clauses that are not equivalent to a narrow scope reading of *even though*. Cases of non-equivalence turn on the fact that concessive clauses don't necessarily involve causation at all, unlike *because*-clauses. This can be seen in (8) and (9) below:

(8) a. The restaurant isn't here even though my map says it should be.

b. # The restaurant is NOT here because my map says it should be.

(9) Context: Previous to today, whenever John leaves for work and it's sunny out, his neighbor's cat greets him at the front door. Today, the cat didn't greet John and it's sunny out. John says:

a. The cat did not greet me even though it's sunny out.

b. # The cat did NOT greet me because it's sunny out.

The (b) sentences are very odd. Likely, this is because scenarios don't involve causation, only a kind of correlation. In (8), it is understood that maps don't cause things to be in the places that they are. However, we do generally expect that when a trusted map indicates that something should be somewhere, it will actually be there. Similarly, in (9), it is clear that the sun being out doesn't cause the cat to greet John. The (b) examples appear to be an utterance by someone dismissing the idea that the subordinate clause would be causally related to the matrix clause.

According to K&S's truth conditions, however, there shouldn't be any difference between the (a) and (b) sentences. In particular, their view seems to get causal constructions wrong; a real notion of causality needs to be baked into the theory. The presupposed conditional connective alone isn't enough to describe causation (see [18] for further discussion). This fact is not necessarily fatal to their analysis of concessive constructions, though. The data in (9), for instance, doesn't dispute that there may be a presupposition that, normally, if it's sunny out, the cat will greet John at the door. In fact, this seems perfectly consistent. What this shows, however, is that causation is not the "opposite" of concession.

A more serious concern for K&S's theory lies in the close relation between concessives and concessive conditionals (especially those with scalar particles) cross-linguistically. [12] notes two pieces of evidence for this. He cites [10] who writes, ""In many, and perhaps all languages, concessive conditionals with focus particles can be used in a factual sense, i.e., in exactly the same way as genuine concessive clauses". Further, historically, concessive conditionals often develop into concessives ([12]), yet the reverse is not true. That is, the transition from concessive conditionals to concessives constitutes a grammaticalization path. This is even true of English, as pointed out by K&S, where *though* was once a conditional subordinator. From K&S's view of concessives, there is no obvious or intuitive connection to concessive conditionals. Given the apparent closeness between the two constructions, an ideal theory of concessives has close parallels to a theory of concessive conditionals.

A third problem concerns the compositional nature of K&S's proposal. The subordinator *even though* contains the scalar particle *even*. Again, concessive conditionals with scalar particles specifically become concessives. As such, it might be expected that the particle is doing some work in concessives, and an ideal theory will have an account of this.

My proposal for *even though* will address these three points. First, it won't make reference to causation, and more clearly represents the correlative nature of *even though*. it will be constructed as an extension of a compositional theory of *even if* adopted from [6]. In this way, the close connection between concessives and concessive conditionals will be established. Further, it will be compositional in that it will make use of a standard view of *even* and a new semantics for *though*. As an upshot, it can further explain why bare *though* carries with it the same concessive inference as *even though*.

3 *Even If*

The concessive conditional *even if* is puzzling due to what [13] calls the "consequent entailment problem". That is, in an *even if*-conditional, the consequent may be entailed, unlike in a regular *if*-conditional where the truth of the consequent is contingent. This can be seen in the following:

(10) a. Even if that bridge were standing, I wouldn't cross the river (⇒ I won't cross the river)

b. If the bridge isn't standing, I won't cross the river. ($\not\Rightarrow$ I won't cross the river)

Previous attempts to account for this by [13] and [2] are problematic as they fail to derive the entailment 1) compositionally and 2) in accordance with more general empirical facts about *even*. More recently, [6] (henceforth G&L) provide a view of *even if* where an independently motivated *even* composes with the conditional sentence and the presuppositions of *even* result in an entailment of the consequent.

3.1 Background on Focus and *Even*

The view on focus adopted here and in G&L is developed in [14], [15]. The focus associating particle *even* quantifies over a set of propositions determined by the ordinary value and focus value of its scope. The ordinary value of an expression, represented by $[\![.]\!]^O$, is whatever the usual semantic value of that expression is (i.e. $[\![\text{Mary}]\!]^O = \text{Mary}'$). The focus value of a sentence, represented by $[\![.]\!]^F$, is the set of propositions with the focused expression in the sentence being replaced by items of the same type (i.e. $[\![\text{John likes [Mary]}_F]\!]^F$ is the set of propositions *John likes* x where $x \in D_e$). Rooth argues *even* has propositional scope at LF. *Even* then takes the ordinary value of the proposition (the prejacent) and a contextually-specified subset C of the focus value (the p-set). To ensure that C is a subset of the focus value, Rooth uses the $\sim$-operator, where $\alpha \sim C$ presupposes that C is a subset of $[\![\alpha]\!]^F$, $[\![\alpha]\!]^O \in [\![\alpha]\!]^f$, and $\exists X \in [\![\alpha]\!]^F . X \neq [\![\alpha]\!]^O$. According to [9], *even* introduces two presuppositions: 1) the scalar presupposition that the prejacent is the least likely to be true among the alternatives in C, and 2) the additive presupposition that one of the alternatives in C is also true. Further, the prejacent is asserted to be true. Thus the formal denotation of *even* is:

(11) $[\![\text{even}]\!](C)(p)(w)$ is defined iff
$\exists q \in C[q \neq p \wedge q(w) = 1] \wedge$ Additive presupposition
$\forall q \in C[q \neq p \rightarrow p <_{likely/expected} q]$ Scalar presupposition
If defined, then $[\![\text{even}]\!](C)(p)(w) = p(w)$ Assertion

3.2 G&L's Proposal

The notion of focus is a crucial aspect of the theory of *even* sketched above. An *even if* conditional like that in (10a) has no clear focused constituent. However, G&L note that the accent in (10a) may fall on either the auxiliary ("were") or the main verb ("standing") of the antecedent and the consequent is still entailed. Thus they propose that what is being focused is some null operator, as in VERUM focus in [7]. This is a covert operator appearing on the antecedent clause that G&L call AFF, which is an identity function:

(12) $[\![\text{AFF}]\!]^O = \lambda\phi_t.\phi$

When this is focused, it will generate only one other alternative: negation of the lambda term. Thus the focus value of AFF is:

(13) $[\![\text{AFF}]\!]^F = \{\lambda\phi.\phi, \lambda\phi.\neg\phi\}$

Thus (10a), repeated as (14a), has the LF in (14b). The focus value of the prejacent is given in (14c), where the two alternatives are named ($a1$) and ($a2$).

(14) a. Even if the bridge were standing, I wouldn't cross the river. ($= p$)

b. Even(C) [if $[\text{AFF}]_F$ the bridge were standing, I wouldn't cross the river]$\sim$C

c. $\left\{\begin{array}{l}\text{if the bridge were standing, I wouldn't cross the river;} \quad (= \text{a1}) \\ \text{if the bridge were } \underline{\text{not}} \text{ standing, I wouldn't cross the river } (= \text{a2})\end{array}\right\}$

With this, we can now calculate the contribution of *even*, i.e. the assertion and presuppositions.

(15) a. Assertion: if the bridge were standing, I wouldn't cross the river.

b. Additive presupposition: $\exists q \in \{a1, a2\}[q \neq p \wedge q(w) = 1]$
$\Leftrightarrow a2 =$ if that bridge were not standing I wouldn't cross the river $= 1$

c. Scalar presupposition: $\forall q \in \{a1, a2\}[q \neq p \rightarrow p <_{likely/expected} q]$
$\Leftrightarrow a1 <_{likely/expected} a2$

The additive presupposition here is the crucial element in entailing the consequent. It ensures that the alternative that is not the prejacent is true. Therefore, we have the following true propositions: "If the bridge were standing, I wouldn't cross the river" and "if the bridge were not standing I wouldn't cross the river". So in any case, whether the bridge is standing or not, I wouldn't cross the river. Further, the concessive flavor is imparted by the scalar presupposition. Namely, it would be more likely that I wouldn't cross the bridge if it were not standing.

4 The Proposal for Concessives

Concessives differ from concessive conditionals in that the propositions in both clauses are entailed. Using (16) as an example, notice that the propositions in both the matrix and the subordinate clause must be true for the sentence to be felicitous. Along with this is the implication of incompatibility or unlikeliness between the two clauses. I will call this the "concessive flavor".

(16) Even though it's raining, John went out for a walk.

My proposal for *even though*-clauses will take G&L's proposal for *even if* as a starting point. The essential insight of that proposal is that there is some focused constituent that leads to a p-set composed of simply a proposition and its negation which *even* then operates over. G&L achieved this with the AFF operator. This same tack could be pursued for *even though*, but it raises a few problems. Unlike *if*, the meaning of *though* on its own is fairly nebulous. What would *though* without *even* mean? Instead, I will pursue a different theory where *though* itself is the focused operator.

This requires a particular semantics for *though*. The essence of *though* is much like AFF, but with differences that give it a bit more elegance and allow for further predictions. The ordinary value of *though* is just the identity function defined for truth values:

(17) $[\![\text{though}]\!]^O = \lambda\phi.\phi$

The focus value of *though* will then be a set containing the ordinary value and the negation of the lambda term:

(18) $[\![\text{though}]\!]^F = \{\lambda\phi.\phi, \lambda\phi.\neg\phi\}$

So far, this is the same as AFF. However, I propose that *though* obligatorily introduces a set of alternatives, much in the way that [4] proposes for polarity sensitive items like *any*. As such, *though* is always carrying a kind of F-marking; alternatives are always active when *though* is present. These alternatives must be exhaustified, in this case by *even*.

Though-clauses also compose with the matrix clause differently. In a way, *even though*-constructions behave somewhat like conjunction, as the propositions in both clauses are entailed. However, the *even though*-clause is, syntactically, an adjunct, not a conjunction. We can derive logical conjunction via Predicate Modification, much like other adjuncts. *Even* will then take scope over the two conjuncts leading to an LF like the following for (16):

(19) Even(C) [[though$_F$ it's raining], John went out for a walk]$\sim C$

This allows us to make the following derivation:

(20) a. Assertion: THOUGH it's raining, John went for a walk
$= p \wedge q$

b. Alternatives: $\left\{ \begin{array}{c} p \wedge q \ (= a1) \\ \neg p \wedge q \ (= a2) \end{array} \right\}$

c. Scalar presupposition: $\forall q \in \{a1, a2\}[q \neq p \rightarrow p <_{likely/expected} q]$
$\Leftrightarrow a1 <_{likely/expected} a2$
$\Leftrightarrow (p \wedge q) <_{likely/expected} (\neg p \wedge q)$

The scalar presupposition captures the concessive flavor of the construction. In words, (20c) says that John going for a walk given that it's raining is less likely than him going for a walk when it's not raining. In general, it rightly derives the reading that it's unexpected that both the subordinate and matrix clauses would be true at once.

The additive presupposition has been omitted here, crucially different from the proposal for *even if*. In fact, the additive presupposition must be omitted here. If the additive presupposition applied in this case, it would result in contradiction. One alternative, ($a1$) in (20b) entails p and the other, ($a2$) entails $\neg p$. The additive presupposition of *even* itself is not without controversy. [16] argues against an additive presupposition for *even* on the basis of examples like the following:

(21) Shes even an ASSOCIATE professor.

The relevant alternatives here would be something like "She's an assistant professor", etc. These alternatives are mutually exclusive; one can't be true without the others being necessarily false. While there are scenarios where she might be an assistant professor at one institution and an associate professor at another, this isn't the reading of the sentence. This sentence can be true even when she's an associate professor at one school and not any other kind of professor. The lack of the additive presupposition in *even though*, then, is in line with other cases where alternatives are incompatible. This is a controversy about *even* that I don't intend to solve here, but I will briefly return to it below in Sect. 5.1.

5 Advantages and Consequences of this Proposal

At the outset of this paper, I noted a certain desideratum of an analysis of *even though*: it compositionally incorporates the scalar particle *even* in a way closely resembling *even if*. In Sect. 5.1 below, I describe this connection in further detail. In addition, I explore bare *though* in Sect. 5.2 and the related particle *still* in Sect. 5.3.

5.1 The Synchronic and Diachronic Connection between *Even Though* and *Even If*

This proposal makes clear that the formal mechanisms involved in the proposal for concessive conditional *even if* are similar to that of concessive *even though*. Both include a focused operator that introduces a set of two alternatives exhaustified by *even*. They differ in two respects. First, they differ in the composition of the prejacent. In G&L's analysis of *even if*, the prejacent is simply an *if*-conditional, perhaps composed in whatever way the reader sees fit; the covert AFF operator activates the proper alternatives without really affecting the meaning of the prejacent. In my proposal for *even though*, despite having a similar semantics to AFF, *though* allows the subordinate clause and the main clause to conjoin via Predicate Modification, resulting in the entailment of the propositions in both clauses.

Second, G&L's analysis of *even if* makes crucial use of the additive presupposition. Without the truth of the other alternative, only the prejacent would be entailed, and it is simply an *if*-conditional where the truth of both antecedent and consequent are contingent. *Even though* statements, by contrast, can't involve an additive presupposition. If the additive presupposition were there, a contradiction would arise and we would expect ungrammaticality. As explained above, however, the fact that no additive presupposition arises with *even though* is in line with other examples involving *even* and incompatable alternatives. [5] offers a solution for this differing behavior. He argues that *even* involves two operators EVEN and ADD targetting the same focused constituent. The EVEN operator contains only the scalar presupposition and entails its prejacent. The ADD operator also entails the prejacent and contains both a modified additive

presupposition and the scalar presupposition. The modified additive presupposition in ADD requires only that more likely *compatible* alternatives be true. Thus, when alternatives are incompatible, there is no ADD and no additivity. The difference in additivity between *even though* and *even if* can be explained, then. The prejacent of an *even though* construction entails that the alternative is false. The prejacent of an *even if* construction, on the other hand, doesn't entail that the alternative is false. With the picture of additivity provided by [5] the additive behavior falls out from the relationship between the alternative and the prejacent.

Under this view of *even though* and *even if*, the crucial difference between the two is the character of their prejacent. The prejacent of an *even though* construction is a conjunction of two propositions, whereas the prejacent in an *even if* construction is a conditional. The difference in additivity falls out as a consequence of the modified presupposition above.

There's a lot to be said about the diachronic picture that will have to remain unsaid here. Crosslinguistically, concessive conditionals with scalar particles develop into concessives ([12], [10]). Further, some languages (e.g. Italian) utilize a concessive conditional construction for both concessive conditionals as well as concessives. Presumably the distinction is distinguished in context. That is, the construction is taken as concessive when it is already known (or perhaps part of the common ground) that the subordinate clause is true. [3] attribute the change from concessive conditional to concessive to "a hearer's tendency to infer as much as possible from the speaker". This inference could in principle be drawn from repeated use of the concessive conditional when the truth of the subordinate clause has been established. Learners then begin to interpret all concessive conditionals as having an entailed subordinate proposition, leading to the concessive. This is a very messy and informal sketch, and much more work needs to be done. However, the view of concessives argued for here is compatible with this line of thinking. *Though* is essentially a bleached *if* denoting an identity function.

5.2 Bare *Though*

So far, this paper has dealt with only *even though*. English has two other concessive subordinators: *though* and *although*[1]. *Though* in particular introduces a particular difficulty:

(22) a. Even though it's raining, John went for a walk.
b. Though it's raining, John went for a walk.

The sentences in (22) seem to have essentially the same meaning. The propositions in both clauses are entailed and the concessive flavor (i.e. the scalar presupposition of *even*) is preserved despite a missing *even* in (22b). The puzzle, then, is explaining this equivalence.

[1] I won't discuss *although* here, but see [17] for differences between it and *even though*. It is likely that the scalar presupposition has been lexicalized in the construction.

With the proposal sketched above, the solution is fairly simple. Recall that *though* activates a set of alternatives. Having been activated, they must then be exhaustified. The overt *even* exhaustifies these in *even though*, as was shown. Following [4], there are two covert exhaustifiers we can invoke for bare *though*, a counterpart to *even* and a counterpart to *only*. If a covert *even* is present, the result will be equivalent to having the overt *even*.

Our other candidate, covert *only*, however, leads to triviality. I assume that the semantics of *only* and its null counterpart O are the following:[2]

(23) $[\![\text{only}_C]\!] / [\![\text{O}_C]\!] =$
$\lambda p.\lambda w.p(w) \wedge \forall q \in C[q \neq p \rightarrow \neg q]$

Simply put, *only/O* affirms the prejacent and negates all other alternatives. When O is applied to *though p, q*, the result is trivial:

(24) a. LF: $O(C)$ [[though$_F$ p], q]$\sim C$
b. Assertion/prejacent: $p \wedge q$
c. Alternatives: $\left\{ \begin{array}{c} p \wedge q \ (= a1) \\ \neg p \wedge q \ (= a2) \end{array} \right\}$
d. Negation of alternative: $\neg(\neg p \wedge q)$
e. De Morgan's law & double negation: $p \vee \neg q$

The result in (24e) is entailed by the assertion in (24b), meaning that O contributes nothing. As argued for in [1], *only* can't be vacuous. Since O is vacuous in this case, it can't exhaustify the alternatives of *though*. Thus, of the two covert exhaustifiers, only one, the counterpart of *even*, can grammatically exhaustify the alternatives introduced by *though*. This leaves covert *even* as the only grammatical exhaustifier. Therefore, the equivalence in (22) is the result of a covert *even* in (22a).

5.3 Concessive *Still*

The particle *still* has several uses, including a concessive use. This can be seen in this example, from [8]:

(25) John studied all night. He still failed the test. (from [8])

Our pre-theoretical understanding of this sentence seems to be much like that of an *even though*-clause. The *still* here indicates some incompatibility between the fact that John studied all night and the fact that he failed the test. [8] provides a semantics for this use of *still* incorporating the scalar presupposition of *even*. *Still* takes two arguments. First, it takes a covert *pro* argument coreferenced with some previous proposition in the discourse, and second, it takes the overt proposition. This makes it type $\langle\langle \text{st}\rangle,\langle\langle \text{st}\rangle,\text{t}\rangle\rangle$. Its denotation (simplified slightly for ease of reading) is the following, with p as the *pro* argument:

[2] [4] argues that there are significant differences between covert and overt *only*, e.g. in the nature of their presuppositions. These differences are insignificant here, and for the sake of simplicity and space, I will ignore them.

(26) $[\![\text{still}]\!]^w = \lambda p.\lambda q : \{w : w \in p \wedge w \in q\} <_{likely} \{w' : w' \in \neg p \wedge w' \in q\}.q(w) = 1$

This has the effect of looking very similar to the proposals for *even if* and *even though* above.

One issue for this analysis, as I see it, is that the covert *pro* is stipulated to be a focused constituent. First, this alone would be strange, as I know of no other case where a covert *pro* is focused. Second, if *pro* is focused, the set of alternatives should include several other propositions that simply are not the *pro* argument, not just its negation. Further, *still* can coexist with *even though*, provided it appears in the matrix clause.

Alternatively, it's possible that *still* itself has a semantics similar to *though*; it is an identity function that introduces a set of alternatives as well as the focused constituent itself. A covert *even* would then be the exhaustifier, just as with *though*. There is no time here to work out the details of this proposal, but certainly an approach like the one just sketched appears promising.

6 Conclusion

I have shown that the meaning of *even though* can be derived compositionally, incorporating an independently motivated meaning for *even* and a novel semantics for *though*. This proposal relates to a semantics for *even if* presented in [6]. As such, it unites concessives with concessive conditionals, which are diachronically and crosslinguistically closely related. This proposal further resembles a semantics for concessive *still*, suggesting further unification.

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