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Quantification with Pejoratives

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Abstract

Following the influential work by Potts (2005), pejoratives have often been understood as expressive items that contribute content to a different dimension of meaning. In this paper, we will show that the standard formal tools as offered by Potts's work and our subsequent extensions of his system (Gutzmann 2011; McCready 2010), cannot deal with certain kinds of data regarding quantification with what we call verbal pejoratives (like German *beglotzen* 'to goggle at' or Japanese anti-honorifics like *chimau*), which have not been studied in much detail. The problem is that there is no way in those systems to quantify across two meaning dimensions at once. To overcome this, we propose a reformulation of the framework that is based on the idea of *compositional multidimensionality*: instead of having just some expressions having multidimensional content, every expression receives a full multidimensional treatment. This solves the two problem of cross-dimensional quantification, since simple multidimensional rule for multidimensional functional application together with a hybridization type shift rule allows a quantifier to apply to both dimensions of a verbal pejorative argument.

1 Introduction

Beginning with the influential work of Potts (2005), conventional implicature and expressive content have been the focus of a great deal of work in the semantics/pragmatics and philosophical communities. Many different sorts of lexical items have been claimed to have a meaning partly or wholly comprised of such content: appositive clauses, certain adverbials, discourse particles, and expressive adjectives, to name only a few. One focus of work in linguistics on this topic has been pejorative expressions. Such expressions have been claimed to carry, as at least part of their meaning, content indicating disapprobation of the individual they are predicated of, or a class of individuals of which she is a member. Alternate analyses are also possible; §3 will review some approaches to the semantics of pejorative items. In this paper, we will take the disapprobatory content of pejoratives to be expressive in nature (or possibly conventionally implicated), for reasons reviewed below.

Potts (2005) has proposed a framework for the analysis of content of this kind which has been adopted by a wide range of authors in subsequent research on the topic. This formal framework, called $\mathcal{L}_{\text{CI}}$, has led to a strong interest on the semantics of expressives and deepened our understanding of how they compose and interact with descriptive content.[1] The ongoing studies of these expressions and related phenomena has also

[1]The "CI" in $\mathcal{L}_{\text{CI}}$ stands for *conventional implicatures*, as Potts tries to unites the different phenomena he studies (i.e. expressives, appositives, supplements etc.) under (his interpretation of) this Gricean category.

lead to substantial extensions of Potts's original system which we collectively call $\mathcal{L}_{CI}^{*}$ (e.g. Gutzmann 2011; McCready 2010), as the original $\mathcal{L}_{CI}$ has been shown to be too restrictive.

This paper is focused on a set of phenomena relating to pejoratives which proves to be problematic for most existing theories. We show in section 5 that even the extended formal tools offered by $\mathcal{L}_{CI}^{*}$ cannot deal with certain kinds of data regarding quantification and pejoratives as a result of some of the formal properties of the logic. These problems do not only involve the standard examples of nominal or adjectival pejoratives (like *bastard, damn* oder Frege's *Köter* 'cur'), but especially also verbal pejoratives (like Germ. *beglotzen* 'to goggle at' or Japanese anti-honorifics).

(1) Alle beglotzen Tina.
everbody goggle Tina
'Everybody is looking at Tina and it annoys me how everybody looks at here.'

The problem with cases like (1) is that the quantifier takes a VP containing a pejorative as its argument. Under an $\mathcal{L}_{CI}^{*}$-analysis, the VP is a 2-dimensional expression containing a truth-conditional component as well as a pejorative aspect. In contrast, the quantifier is a plain 1-dimensional expression. Crucially, applying a 1-dimensional expression to a 2-dimensional argument is not possible under any current version of $\mathcal{L}_{CI}^{*}$, as we will illustrate.

In the following, after summarizing some approaches to the meaning of pejoratives in § 3, we will proceed to an outline of $\mathcal{L}_{CI}^{*}$ in §4, and then present the problematic cases in § 5. We then show in section 6 how these obstacles can be overcome if we revert to a system that employs "true" compositional multidimensionality. Before going on, let us however start with some terminological and conceptual considerations and discussion of relevant data in the next section.

2 Pejoratives and use-conditional meaning.

Instead of using the term *expressive* meaning as introduced by Potts (2007), we rather prefer to call the meaning contributed by the phenomena under discussion *use-conditional* meaning (Gutzmann 2015), for the simple reason that the class of expressions that contribute the kind of projective meaning modeled by $\mathcal{L}_{CI}^{*}$ goes beyond the stereotypical characterization of expressives in a strict sense. That is, besides the standard examples of expressive adjectives, honorifics, or ethnic slurs, there are also expressions like particles in German (Gutzmann 2015) or Japanese (McCready & Takahashi 2013) or even syntactic constructions (Frey 2010) that fall under the scope of the framework provided by the formal systems we will discuss in this paper. Accordingly, we will speak of expressions that contribute use-conditional meaning as *use-conditional items* or UCIs for short.

Given this terminological distinctions, we take expressives to be a semantic subclass of UCIs, namely those UCIs convey an evaluative attitude. Pejoratives, in turn, are then expressives with a negative (default) polarity, in contrast to honorifcs. We can then also further distinghuish betwenn expletive pejoratives, like *bastard*, and mixed pejoratives, like *cur* or *Kraut*, which differ with respect to whether they also contribute truth-conditional content (TC) or only use-conditional content (UC).[2]

(2) That **bastard** Dan got promoted.
TC: Dan got promoted.
UC: I have a negative attitude towards Dan.

[2] Here and in the following, we use **bold face** to highlight the relevant aspect of the examples.

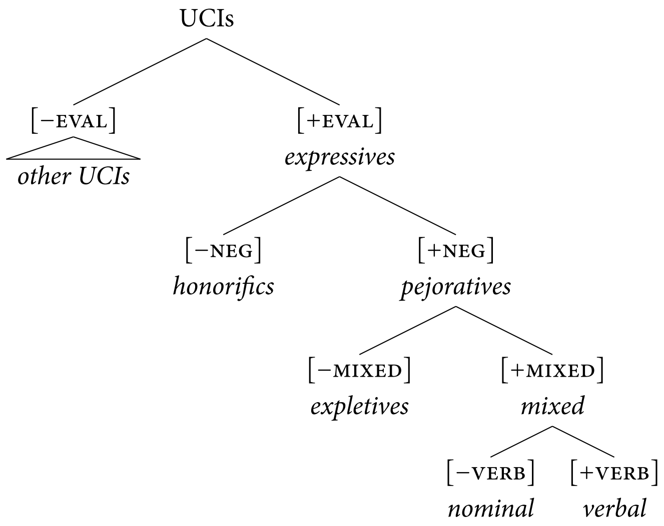


Figure 1: Partial landscape of use-conditional meaning

(3) Dan is a **Kraut**.
TC: Dan is German.
UC: I have a negative attitude towards Germans.

A final distinction then can be made between nominal pejoratives like the ones just mentioned and verbal pejoratives, which are hardly acknowledged in the pejorative literature. Instead of conveying a negative attitude toward members of a certain class or group, like nominal pejoratives do, verbal pejorative express a negative evaluation of the action encoded in the truth-conditional dimension of the pejoratives. For instance, German *labern* 'to jabber' conveys a negative characterization towards a speaking situation.

(4) Heino **labert** von Autos.
Heino jabbers of cars
TC: Heino talks about cars,
UC: which is annoying.

In a similar vein, the Japanese *chimau* can be analyzed as a morpheme that derives verbal pejoratives, or "anti-honorifics" in Japanese (Davis & Gutzmann 2015; Potts & Kawahara 2004).

(5) esugoshi-**chimat**-ta
*oversleep-**antihon**-*PAST
TC: I overslept,
UC: which sucks.

The relations between the different kinds of pejoratives and their relation to expressives and other UCIs is illustrated in Figure 1.

Having laid out these emprical distinctions, let us now sketch the philosphical background against which the remainder of this paper will be framed. In discussing the previous example, we already applied a multidimensional view by seperating the content of sentences containing of pejoratives into a truth- and use-conditional tier. This idea of employing use- along side truth-conditions goes back to Kaplan's influential paper on the meaning of *ouch* and *oops*, in which he argues that truth-conditions alone are not sufficient to cover all semantic aspects of natural language. That is, for certain expressions, like Kaplan's *oops*, their semantics is better captured by use-conditions, as in (U), instead of the truth-conditions that give the meaning of truth-conditional statements as in (T).

(T)	*Truth-conditions* $_1$ "Snow is white" $_2$ is **true**, $_3$ iff snow is white.	(U)	*Use-conditions* $_1$ "Oops!" $_2$ is **felicitously used**, $_3$ iff the speaker observed a minor mishap.

In both conditions, a natural language expression, in the first line, is connected with a condition in the third line, which is supposed to capture its meaning. What differs is the kind of connection — the "mode of expression", as Kaplan calls it. In (T), the connection is established by the notion of truth, while in (U) it is felicitous use that connects the expression and the condition. The conditions in both (T) and (U) can either be the case or not, which enables us to extend the standard formal tools developed for the evaluation of truth-conditional content (T) to the evaluation of use-conditional content (U). That is, just as (T) leads us to think of the proposition expressed by "Snow is white" as the set of *worlds* in which that sentence is true, we can construe the use-conditional proposition expressed by "Oops!" as the set of *contexts* in which the speaker observed a minor mishap (Kaplan 1999: 17). The idea of a hybrid semantics, as we call it, is then to employ both dimensions simulatanouesly, since there are many expressions, simple or complex, that contribute content in both meaning dimensions. As already illustrated above, pejoratives like *Kraut* in (3) are an obvious case in point for such hybird, or mixed, expressions (Williamson 2009).

(6) a. "Dan is a Kraut" is **true** if Dan is German.
b. "Dan is a Kraut" is **felicitously used** if the speaker has a negative attitude towards Germans.

Multidimensional semantic systems like $\mathcal{L}^*_{\mathrm{CI}}$, that can calculate two meaning dimensions in tandem, have proven to provide good tools for a formal approach to such pejoratives.

3 The Semantics of Pejoratives

Pejoratives are well-studied in linguistics and philosophy (cf. e.g. Hom 2010; McCready 2010; Richard 2008), and a variety of analyses of them have been proposed. In this section, we briefly review some of this literature, with an eye to situating our analysis in the landscape of possible views on the semantics of pejoratives. To briefly preview, we will take the position that pejoratives simultaneously convey truth-conditional and use-conditional content, where the pejorative part is use-conditional, indicating disapprobation with respect to (for standard cases of pejoration) particular classes of individuals, and (for other cases) particular individuals or actions.

The philosophical literature on pejoratives focuses (to our knowledge) entirely on nominal pejoratives of the sort exemplified with the more or less innocuous examples in (7), which are usually called *slurs* (at least within this literature). It is possible to separate out several families of views on slurs that have been proposed. This project is carried out by Anderson & Lepore (2013), whose discussion and terminology we will partly follow here. It must be noted that the philosophical literature is richer in terms of its discussion of the content of slurs than is the (formal) linguistic literature; the latter focuses almost entirely on issues of composition, putting aside the question of what slurs actually *mean*. In this paper, we will not completely be exceptions to this generalization, as our main focus is also on problems of composition. Still, we will be fairly specific about the meanings we assume for pejoratives. Our initial aim here is mostly to motivate our major assumption: that slurs (and, by extension, other kinds of pejoratives) carry, at least in part, use-conditional content.[3]

Pejoratives are often cited as examples of expressive content, which will be the line we take here. On such views, the descriptive or at-issue content of slurs like those in (7) is membership in some group (hereafter *categorizing*), and they provide the use-conditional content that that group is negatively regarded or otherwise bad (hereafter *slurring*). The details of how this view can be implemented formally will be provided in the next section.

(7)		*expression*	*categorzing*	*slurring*
	a.	honky	caucasian	'I dislike Caucasians'
	b.	Kraut	German	'I dislike Germans'
	c.	Yank(ee)	US American	'I dislike US Americans'
	d.	Limey	Britan	'I dislike Britons'
	e.	Frog	French	'I dislike the French'

This view is not at all uncontroversial. Other authors, such as Hom (2008), claim that the entire content of slurs – both slurring content and categorizing content – is at-issue; for Hom in particular, the slurring content is taken to arise from social practice, and have the form (roughly) "x is a member of group X and has property P, property Q, …, just because of belonging to X." Since these stereotypes do not apply in the real world, predications of slurs are always, for Hom, false; this intuition has been highly controversial in the literature. One example of the difficulties that arise for this position comes from examples like (9), as discussed in Jeshion 2013.

(8) Yao is a Chink.

(9) Yao is not a Chink.

Given that predications of slurs are always false, (9) should come out true; but it still seems just as offensive (and presumably false, for those who share this judgement), as (8) is. This is problematic. The available way out seems to be to say that the mere use of 'Chink' results in the implicature that the speaker holds the relevant attitudes. But what is the status of this implicature? If it is a conversational implicature, it should be cancellable, but it does not seem to be; conversely, in order to claim that the implicature always arises it is natural to think of it as something expressed by the term 'Chink'. In turn, such an implicature has all the hallmarks of use-conditional content: escaping the scope of negation, as in (9), being bound to particular lexical items, etc. This sort of example thus seems to us to support the view of slurs as carrying content which is in part use-conditional.[4]

[3] For a much more complete overview of the range of views currently on the market, an excellent source is the special issue *Analytic Philosophy* Vol. 54 No. 3 (September 2013), which provides a range of possible approaches to the meaning of slurs and argumentation relating to the choice between them.

[4] Anderson & Lepore (2013) propose a different view, which they call Prohibitionism, according to which

What about non-slurs? Many show something like a similar structure, such as terms like *asshole* and *bastard*, which also couple predications of some sort with a statement of disapprobation. Terms like this presumably have only attenuated descriptive content, so that the semantic action there is all in the use-conditional side.[5] The same appears to hold for some verbal pejoratives, particularly for the Japanese anti-honorifics we will discuss below. In this paper, we will not commit ourselves to a specific, general analysis of the meaning of pejoratives beyond this division of labor, as it is not key for our purposes here, which involve the proper analysis of pejorative quantification; however, in the next section, we will introduce a concrete semantics for some pejorative terms for illustrative purposes.

One might wonder exactly how the dividing line between pejoratives and non-pejoratives is to be set on this approach.[6] In particular, consider the expression *Chinese*. Above, we claimed that *Chink* introduces a use-conditional disapprobation with respect to the Chinese ethnic group. But couldn't one then also say that *Chinese* introduces an anti-implicature of disapprobation with respect to the same ethnic group? This seems to be an unappealing position. Here, we would like to appeal to a general communicative principle to show why this anti-implicature might arise even in the absence of genuine anti-pejorative content. Suppose that the language being spoken contains an expression A with truth-conditional content C, and another expression B with content C and also the use-conditional content C'. Given that the speaker can choose freely between A and B (which will be so if she is willing to accept any social consequences of using them), her use of A will imply that she was not willing to use B, which in turn implicates that she is not willing to commit to C'.[7] From this kind of inference, the conclusion that the user of the term *Chinese* does not subscribe to a pejorative attitude toward Chinese people can arise even without assuming such content to be part of the lexical semantics of the term itself.

With this basic background in place, we now turn to the semantic framework which we will use for the analysis of pejoratives; once this framework is in place, we will be able to state the denotations of pejoratives (at some level of abstraction), at which point the problems arising in pejorative quantification will become clear.

4 $\mathcal{L}^*_{\mathrm{CI}}$ – $\mathcal{L}_{\mathrm{CI}}$ and its extensions

It was the influentual work on conventional implicatures and expressive meaning of Potts 2005 that sparked a renewed interest in pejoratives and honorifics and expressive meaning in general. The multidimensional framework offered there has been fruitfully applied to various phenomena. However, the original logic $\mathcal{L}_{\mathrm{CI}}$ has been argued to be too restrictive, and therefore, several extensions have been developed to broaden the empirical scope of that approach (Gutzmann 2011; McCready 2010). However, although

slurs are offensive just because they are prohibited. The knowledge that they are prohibited, and of why, provides information about the likely attitudes of those who use the slurs, which in turn yields (according to Anderson and Lepore) the illusion of semantic content; the actual content is identical to that of a non-slurring categorizing term. We will not evaluate the merits of this approach here, but it seems to us an intriguing avenue for exploration with respect to the semantics of use-conditoinal content in general.

[5] It may be that the at-issue content is limited to something like the introduction of a discourse referent or perhaps even just an identity function in the case of predicative uses of pejoratives; see Gutzmann 2015; Gutzmann & McCready 2014 for some related discussion.

[6] Thanks to a reviewer for raising this point.

[7] This idea is based on the 'Maximize Presupposition' principle of Schlenker 2012, which is oriented toward other kinds of non-truth-conditional content.

these frameworks – which we collectively refer to as $\mathcal{L}^*_{\mathrm{CI}}$ – have widened our understanding of how expressive meaning interacts with other meaning components, there are still open issues, two of which we will address in this paper. The first one regards the general approach to multidimensional meaning taken in the $\mathcal{L}^*_{\mathrm{CI}}$ and how that leads to worries about compositionality as well as to a proliferation of types and combinatoric rules. The second one regards specific constructions involving quantification that cannot be analyzed due to the way composition works in $\mathcal{L}^*_{\mathrm{CI}}$. As we will argue, both issues can be solved by the same modification of the framework. In the following, we will first give a brief outline of $\mathcal{L}_{\mathrm{CI}}$ and its extensions, before illustrating the problems that will lead us to a reformulation in the next section.

4.1 Composition in LCI

The data for which the original $\mathcal{L}_{\mathrm{CI}}$ (Potts 2005) was developed is confined to what we might call expletive (functional) UCIs (see Gutzmann 2013 for an overview of the different kinds of UCIs). By this, we mean expressions that, once applied to their truth-conditional argument, express just use-conditional content (UC). That is, adding them to or removing them from a sentence does not alter its truth-conditional content (TC). Standard examples are expressive pejorative adjectives like *damn*.

(10) That damn Kaplan got promoted.
TC: Kaplan got promoted.
UC: The speaker has a negative attitude towards Kaplan.

From a formal perspective such UCIs are distinguished from ordinary truth-conditional items by having a semantic type that involves a use-conditional type in its output. $\mathcal{L}_{\mathrm{CI}}$ therefore extends the common type definition in (11) by a new basic expressive/use-conditional type and a corresponding recursive definition for complex use-conditional types as in (12).

(11) *Ordinary truth-conditional types*
a. e, t, s are basic truth-conditional types.
b. If σ, τ are truth-conditional types, $\langle \sigma, \tau \rangle$ is a truth-conditional type.

(12) *Simple use-conditional types*
a. u is a basic use-conditional type. ("use-conditional proposition")
b. If σ is a truth-conditional and τ is a use-conditional type, $\langle \sigma, \tau \rangle$ is a use-conditional type.

The combinatorics of those new types is regulated by a corresponding new composition rule for use-conditional application. Instead of the tree notation used in Potts 2005, we will use the proof-style notational variant employed in McCready 2010 here.

(13) $$\frac{\alpha : \langle \sigma^a, \tau^c \rangle \qquad \beta : \sigma^a}{\beta : \sigma^a \bullet \alpha(\beta) : \tau^c}$$

This rule ensures that if a UCI combines with its argument, it is isolated from the descriptive content (which is indicated by the "•"). Crucially, this rule is "non-resource sensitive", which means that the argument of the UCI is passed along unmodified. In addition to this rule, we also need an elimination rule that strips off saturated use-conditional content so that it does not interfere with the truth-conditional content for the rest of the derivation.

(14) $$\frac{\beta : \tau^a \bullet \alpha : t^c}{\beta : \tau^a}$$

After the application of this rule, the descriptive argument of the UCI becomes free to participate in further derivations, just as if the use-conditional content never had been there in the first place.

With these two new rules, together with ordinary functional application, we can derive examples like (10).

(15) That damn Kaplan got promoted.

$$\cfrac{\cfrac{\cfrac{\mathbf{damn} : \langle e, u \rangle \qquad \mathbf{kaplan} : e}{\mathbf{kaplan} : e \bullet \mathbf{damn}(\mathbf{kaplan}) : u}}{\mathbf{kaplan}} \qquad \mathbf{got\text{-}promoted} : \langle e, t \rangle}{\mathbf{got\text{-}promoted}(\mathbf{kaplan}) : t}$$

The problem with this set of types and rules, as offered by $\mathcal{L}_{\mathrm{CI}}$, is however, that it has been shown to be too restrictive, as it can only deal with purely expletive UCIs that do not interact with a sentence's truth-conditional content (aside from taking that content as input). More specifically, it can neither deal with mixed expressives (Gutzmann 2011; McCready 2010) nor so-called shunting UCIs that lead to pure use-conditional content (McCready 2010), nor yet use-conditional modification (Gutzmann 2011). For instance, *Kraut* in (16) contributes truth-conditional and use-conditional content simultaneously. It predicates the property of being German in the truth-conditional dimension, while expressing a pejorative attitude towards Germans in the use-conditional tier.

(16) Lessing was a Kraut.
TC: Lessing was a German.
UC The speaker has a negative attitude towards Germans.

Shunting UCIs, on the other hand, neither contribute truth-conditional content like mixed UCIs nor are they non-resource-sensitive as expletive UCIs are. They do not pass back their argument but simply take it, so to speak, without leaving anything at all in the truth-conditional dimension. An example is the exclamative operator that is arguably present in exclamatives like (17) and which leads to a speech act that only has use-conditional content (cf. Castroviejo Miró 2008).[8]

(17) How tall he is!
TC: ∅
UC: The speaker is surprised by his degree of tallness.

Finally, there are expressions that modify other use-conditional items as in (18), where *fucking* intensifies the expletive pejorative *bastard*, something that is also not accounted for by the original $\mathcal{L}_{\mathrm{CI}}$ (Geurts 2007).

[8] Even though we think that the claim that exclamatives as in (17) encode only use-conditional content is basically correct, we do not want to defend it here, as we use it just for the sake of illustrating the idea of what shunting UCI lead to. For other cases of shunting UCIs, see, for instance, Bücking & Rau 2013; Gutzmann 2013; Gutzmann & Henderson 2015; McCready 2010. For an analysis of exclamatives in non-use-conditional terms, cf. Rett 2008, 2012.

(18) That [[**fucking** bastard] Kaplan] got promoted.

TC: Kaplan got promoted.
UC: The speaker has a **highly** negative attitude towards Kaplan.

To account for all those cases, $\mathcal{L}_{\text{CI}}$ has been extended by additional types and composition rules. That is, besides the ordinary truth-conditional types in (11) and (12), we now have new basic and complex types for shunting UCIs as in (19), as well as new recursive definitions for mixed (20) and pure use-conditional types (21).

(19) *Shunting types*

a. u^s is a shunting type.
b. If σ a is truth-conditional or shunting type, and τ is a shunting type, $\langle\sigma,\tau\rangle$ is a shunting type.

(20) *Mixed types*

If σ,τ are truth-conditional types and ρ is a shunting type, then $\langle\sigma,\tau\rangle \times \langle\sigma,\rho\rangle$ is a mixed type.

(21) *Pure use-conditional types*

If σ,τ are simple use-conditional types then $\langle\sigma,\tau\rangle$ is an use-conditional type.

These new types of course need corresponding composition rules, which are also added to the inventory of $\mathcal{L}^*_{\text{CI}}$: we now have rules for shunting, mixed, and pure application as well as a rule for mixed elimination. That is, the full range of types for $\mathcal{L}^*_{\text{CI}}$ is given by the definition in (11), (12) and (19)–(21), while the full set of composition rules is as given in Figure 2.

Functional application

$$\frac{\alpha : \langle\sigma^a,\tau^a\rangle \qquad \beta : \sigma^a}{\alpha(\beta) : \tau^a}$$

Expressive application

$$\frac{\alpha : \langle\sigma^a,\tau^c\rangle \qquad \beta : \sigma^a}{\beta : \sigma^a \bullet \alpha(\beta) : \tau^c}$$

Shunting application

$$\frac{\alpha : \langle\sigma^{\{a,s\}},\tau^s\rangle \qquad \beta : \sigma^{\{a,s\}}}{\alpha(\beta) : \tau^s}$$

Mixed application

$$\frac{\alpha \blacklozenge \beta : \langle\sigma^a,\tau^a\rangle \times \langle\sigma^a,\upsilon^s\rangle \qquad \gamma : \sigma^a}{\alpha(\gamma) \blacklozenge \beta(\gamma) : \tau^a \times \upsilon^s}$$

Pure application

$$\frac{\alpha : \langle\sigma^{\{s,c\}},\tau^c\rangle \qquad \beta : \sigma^{\{s,c\}}}{\alpha(\beta) : \tau^c}$$

Expressive elimination

$$\frac{\beta : \tau^a \bullet \alpha : t^c}{\beta : \tau^a}$$

Mixed elimination

$$\frac{\alpha \blacklozenge \beta : \sigma^a \times t^s}{\alpha : \sigma^a \bullet \beta : t^c}$$

Figure 2: Composition rules for $\mathcal{L}^*_{\text{CI}}$

Even if the extended set of types and composition rules of $\mathcal{L}^*_{\text{CI}}$ is able to overcome the restrictiveness of the original $\mathcal{L}_{\text{CI}}$ and thereby leads to a better coverage of the empirical data, it comes with a conceptual cost, as lot of the initial appeal of $\mathcal{L}_{CI}$– its relatively simplicity in terms of the combinatorics and type extensions – gets lost. However, we will show that the amount of types and rules can be reduced by the same strategy that solves the compositionality issue.

4.2 Compositionality

As we have seen in (15), the basic idea of how the composition of the two meaning dimensions in $\mathcal{L}^*_{CI}$ works can be sketched as follows. If a use-conditional item reaches propositional status, it becomes isolated from the descriptive content (indicated by the bullet •) and then is "stranded" inside the derivation, in such a way that it is inaccessible for further modification.

So far, however, this is only one part of the story. Of course, we somehow want the use-conditional content dangling inside the derivation to be interpreted after all. This is achieved by a mechanism called parse tree interpretation (Potts 2005). By the use of this mechanism, instead of merely interpreting the root of a derivation – which corresponds to the truth-conditional content except if shunting UCIs removed it – it interprets the entire proof, so that one arrives at an interpreted pair whose first projection is the sentence's truth-conditional content (i.e. the root of the proof) and whose second dimension is the collection of all dangling use-conditional propositions.

(22) *Parsetree interpretation*

The interpretation of a proof tree $\mathcal{T}$ with a term $\alpha : \sigma$ on its root node, and distinct terms $\beta_1 : u, \ldots, \beta_n : u$ on nodes in it is

a. $[\![\mathcal{T}]\!] = \langle [\![\alpha]\!], \{[\![\beta_1]\!], \ldots, [\![\beta_n]\!]\}\rangle$, if σ is a truth-conditional type.

b. $[\![\mathcal{T}]\!] = \langle T, \{[\![\alpha]\!], [\![\beta_1]\!], \ldots, [\![\beta_n]\!]\}\rangle$, if σ is a shunting type, where T is a trivial proposition.

Hence, for example (15), parsetree interpretation delivers us the following interpretation:

(23) $[\![(22)]\!] = \langle [\![\textbf{got-promoted}(\textbf{kaplan})]\!], [\![\textbf{damn}(\textbf{kaplan})]\!]\rangle$

However, there is a problem with this procedure. As it has been noted, this "parsetree interpretation" does not fulfill the ordinary principle of compositionality, according to which only the immediate parts of a complex expression (and the way in which they are combined) are taken into account in order to calculate the meaning of complex expressions.

> Though formally precise, this method is not compositional. The reason is that the computation of the side-issue content draws information from deeply embedded expressions (the supplement phrases), rather than only from the denotation of the sentence's immediate subconstituents. (Barker et al. 2010)

There are some recent proposals to account for use-conditional content in a way that respects compositionality (Barker et al. 2010 use continuations; Giorgolo & Asudeh 2012 use monads), but only at the cost of introducing a much more powerful machinery and using a completely different system. Instead of a complete redesign, we will present a framework that is close to the spirit of $\mathcal{L}^*_{CI}$: a compositional and, we believe, simpler reformulation of the core ideas of $\mathcal{L}^*_{CI}$, which has the further advantage of being able to analyze the data in the following section.

4.3 Denotations

Before turning to that project, we would like to concretize our discussion of the denotations of pejoratives. Within the $\mathcal{L}_{\mathrm{CI}}^{*}$ context, the pejorative meanings we have proposed correspond to the denotation in (24) for 'Kraut ' (cf. McCready 2010):

(24) $\textit{Kraut} \rightsquigarrow \lambda x.[\mathbf{german}(x)] \blacklozenge \mathbf{bad}(^{\cap}\mathbf{german}) : \langle e, t\rangle^{a} \times t^{s}$

Thus, 'Kraut' predicates Germanness of its argument and indicates that Germans, as a class (derived by using the kind formation operator of Carlson 1980), are bad according to the speaker.

We believe this is in accord with intuitions, but (as a reviewer points out) it does leave out certain aspects of pejorative meaning. One obvious issue is that it is not fully obvious how to capture the difference between mild pejoratives like *Kraut* and more offensive ones like *faggot* or the like. This project has not been discussed in the literature, as far as we know. We see two simple ways to integrate the varying strength of pejoratives into the semantics proposed above. The first is simplest: for the case of strong pejoratives, we add a modifier which strengthens the use-conditional disapprobation. For the case of *faggot*, that would look as follows:

(25) $\textit{faggot} \rightsquigarrow \lambda x.[\mathbf{gay}(x)] \blacklozenge \mathbf{very}(\mathbf{bad}(^{\cap}\mathbf{gay})) : \langle e, t\rangle^{a} \times t^{s}$

This is simple enough, but has the disadvantage that it is not clear how to model a very wide range of different levels of disapprobation via simple modification. A more general mechanism seems desirable. One can easily be provided by making the expressions of disapprobation gradable rather than categorical. For example, Potts & Kawahara 2004 assume that Japanese honorifics denote attitudes of the speaker toward various individuals, modeling them by a domain of relations between individuals lying in the interval [-1,1], where negative (positive) numbers indicate negative (positive) attitudes. Something similar could easily be implemented for the weak and strong pejoratives we discuss here.

5 Quantificational problems with pejoratives

The quantificational problem we will present all involve mixed expressives. As discussed above, these are UCIs that contain both a descriptive and an expressive component. We will focus on verbal pejoratives in German and anti-honorifics in Japanese.[9]

(26)
a. *beglotzen* 'goggle' $\rightsquigarrow$ $\mathbf{look} \blacklozenge \textsc{bad}(\mathbf{look})$
b. *labern* 'jabber' $\rightsquigarrow$ $\mathbf{talk} \blacklozenge \textsc{bad}(\mathbf{talk})$
c. *begrabschen* 'grab' $\rightsquigarrow$ $\mathbf{touch} \blacklozenge \textsc{bad}(\mathbf{touch})$
d. *fressen* 'gorge' $\rightsquigarrow$ $\mathbf{eat} \blacklozenge \textsc{bad}(\mathbf{eat})$

Along with Korean and Javanese, Japanese is one of the best-known cases of a language that employs a rich system of honorifics (see Kikuchi 1997 for a detailed discussion).

[9] In light of the fact that both *beglotzen* and *begrapschen* are prefixed by *be-* (whose main function is to transitivize an otherwise intransitive verb), an anonymous reviewer suggested that it may be this prefix that contributes the pejorative aspect of the complex verb, while the base verb itself is not. While this intuition is not shared by our informants, such an analysis would render *be-* similar to the Japanese *chimau* discussed in (5) and further below in the main text. Ignoring the transitivization, which would require a more fine-grained lexical semantic setting, such a "pejorativizer" can be easily represented in $\mathcal{L}_{\mathrm{CI}}^{+}$ by the mixed-type expression $\lambda P \lambda x.P(x) \blacklozenge \lambda P.\lambda x.\mathbf{bad}(P(x)) : \langle\langle e, t\rangle, \langle e, t\rangle\rangle \times \langle\langle e, t\rangle, \langle e, t^{s}\rangle\rangle$.

Honorification in Japanese can involve nominal morphology, but most theoretical discussion has focused on verbal morphology, as in the example (27), which employs a suppletive honorific form meaning 'come' together with an honorific meaning.

(27) Yamada-sensei-ga **irasshaimasi**-ta
Y-teacher-NOM *came*.HON-PST
'Teacher Yamada came' • 'I honor him'

In addition to honorifcs, Japanese has also been claimed to exhibit a (much smaller) set of anti-honorifics that are akin to (verbal) pejoratives (Potts & Kawahara 2004). These are verbal suffixes that either target the subject (*yagaru*) or the entire proposition (*chimau*).

(28) Sam-ga warai-**yagat**-ta.
Sam-NOM laugh-ANTIHON-PAST
'Sam laughed.' • 'I view Sam negatively.'

(29) Taro-ga Jiro-o nagut-**chimat**-ta
Taro-NOM *Jiro*-ACC *hit*-PEJ-PAST
'Taro punched Jiro' • 'That was bad'

In this paper, we will characterize such expressions as pejoratives proper, not as anti-honorifics; we take the meanings of honorifics to be properly characterized in terms of factors like social distance, formality of social setting and the like (cf. McCready 2014), while the meanings of *-yagaru* and *-chimau* are purely emotive. Potts & Kawahara 2004 treat honorifics and their 'antihonorifics' on a par, in that their analysis of honorifics states their denotations in terms of emotive attitudes. Specifically, they introduce objects which indicate emotive attitudes of individuals toward other individuals to the model theory; such objects have the form aIb, where $I \sqsubseteq [0, 1]$. Intervals above 0 indicate positive attitudes, and those below 0 indicate negative attitudes; the breadth of the interval further shows the specificity or nonspecificity of the attitude. Thus, $a[-.7, -.5]b$ states that a has a rather negative attitude toward b, while $a[-.6, .8]b$ has a almost completely neutral toward b, but slightly more positive than negative. Potts and Kawahara then take honorifics to act on semantic objects of this form. But this picture appears to conflate emotivity with (shows of) respect in a problematic way (McCready 2014, 2015 discusses this point more fully). Nonetheless, this analysis seems to us reasonable for their 'anti-honorifics', i.e. the pejorative cases we discuss in this paper, although not for honorifics proper; consequently, we will depart from their terminology here, and use the term verbal pejoratives for these cases as well.

It is worth noting briefly that this discussion points up a difference between verbal pejoratives and the sort of nominal pejoratives – i.e. slurs – that have driven the philosophical discussion summarized in §3: while the negative attitudes introduced by slurs are driven usually by membership in some stigmatized group, verbal pejoratives have no such quality, and are strictly emotive in nature. This leaves open the possibility that the negative quality of slurs also should be understood using continuous models like those of Potts and Kawahara (which we already raised for different reasons in the last section); we will not pursue this point further here as it is somewhat orthogonal to our main line of discussion, but it certainly seems a reasonable area for future exploration.

In terms of $\mathcal{L}^{*}_{\mathrm{CI}}$, the expressions in (29) can be analyzed as 'normal' expletive UCIs (Gutzmann 2013) which do not introduce mixed content, unlike the case of *irassharu*: the descriptive content associated with the predication comes from the verb stem, while the expressive morphology adds the pejorative aspect of the meaning.[10]

[10] See Fortin 2011 for more on expressive morphology.

Simple sentences involing such verbal pejoratives can easily be analyzed by the tools offered by $\mathcal{L}^*_{\mathrm{CI}}$. For instance, consider the following derivation for one of the German verbal pejoratives. For the sake of illustration, suppose that *glotzen* 'goggle' is a mixed UCI meaning 'to look at' in the descriptive dimension, while expressing a negative attitude towards the looking in the use-conditional dimension (represented simply by **bad**).

(30) Heino beglotzt Tina.
Heino goggles Tina
'Heino is goggling at Tina'

$$\dfrac{\dfrac{\dfrac{\dfrac{\textit{Heino}}{\mathbf{heino} : e} \quad \dfrac{\dfrac{\textit{beglotzt}}{\mathbf{look\text{-}at} \blacklozenge \lambda x \lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(x)(y)) : \langle e, \langle e,t\rangle\rangle \times \langle e, \langle e, u^s\rangle\rangle} \quad \dfrac{\textit{Tina}}{\mathbf{tina} : e}}{\mathbf{look\text{-}at}(\mathbf{tina}) \blacklozenge \lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(\mathbf{tina})(y)) : \langle e,t\rangle \times \langle e, u^s\rangle}}{\mathbf{look\text{-}at}(\mathbf{tina})(\mathbf{heino}) \blacklozenge \mathbf{bad}(\mathbf{look\text{-}at}(\mathbf{tina})(\mathbf{heino})) : t \times u^s}}{\mathbf{look\text{-}at}(\mathbf{tina})(\mathbf{heino}) : t \bullet \mathbf{bad}(\mathbf{look\text{-}at}(\mathbf{tina})(\mathbf{heino})) : u}}{\mathbf{look\text{-}at}(\mathbf{tina})(\mathbf{heino}) : t}$$

However, although $\mathcal{L}^*_{\mathrm{CI}}$ can handle these cases (in contrast to the original $\mathcal{L}_{\mathrm{CI}}$), it is not able to deal with certain quantificational constructions like simple subject quantification and object quantification with quantifier raising. We begin with an example of the former.

(31) Alle beglotzen Tina.
everbody goggle Tina
'Everybody is goggling at Tina'

The problem is if, after having combined the verbal pejorative with its direct object, once the meaning is correctly distributed into the two dimensions of the mixed predicate, the resulting expression still must combine with the quantifier in subject position.

(32)

$$\dfrac{\dfrac{\textit{Alle}}{\mathbf{everybody} : \langle\langle e,t\rangle, t\rangle} \quad \dfrac{\dfrac{\textit{beglotzen}}{\lambda x \lambda y.\mathbf{look\text{-}at}(x)(y) \blacklozenge \lambda x \lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(x)(y)) : \langle e, \langle e,t\rangle\rangle \times \langle e, \langle e, u^s\rangle\rangle} \quad \dfrac{\textit{Tina}}{\mathbf{tina} : e}}{\lambda y.\mathbf{look\text{-}at}(\mathbf{tina})(y) \blacklozenge \lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(\mathbf{tina})(y)) : \langle e,t\rangle \times \langle e, u^s\rangle}}{\lightning}$$

This results in a type clash, so the derivation fails. This is so because in $\mathcal{L}^*_{\mathrm{CI}}$, 1-dimensional mixed expressions can only apply to a single argument, but there is no rule that allows a 1-dimensional expressions (like the quantifier) to apply to a 2-dimensional argument.

Another, more complex case, involves a quantified DP in object position.

(33) Heino beglotzt jedes Mädchen.
Heino goggles every girl.
'Heino goggles at every girl.'

The problem of quantifiers in object position is that, under standard typing and surface constituency, the expressions cannot be combined, as *to goggle at* is of type $\langle e, \langle e, t\rangle\rangle$ and therefore needs a type e direct object, while *every girl* is a quantifier of type $\langle\langle e, t\rangle, t\rangle$. A common solution to this mismatch is the assumption of quantifier raising (QR) at LF (Heim & Kratzer 1998). The direct object moves to take scope over the entire sentence, leaving an index trace behind, which is bound by an index that is adjoined to the sentence at the position below the one to which the quantifier has been raised. This gives us the following LF structure for (33).

(34) [[$_{\mathrm{QP}}$ every girl]$_i$ [1 [Heino [$_{\mathrm{VP}}$ goggles at t_1]]]]

When this LF is interpreted by the semantics, the trace is interpreted as a variable. Crucially, the binding index above the sentence has to be understood as a lambda abstractor binding that variable. However, when we now substitute the semantic representations for the expressions in (34) and compose the complex expressions in accordance with the proof rules of $\mathcal{L}_{\mathrm{CI}}^{*}$, we arrive at the following derivation.

(35)

$$\dfrac{\mathbf{every(girl)} : \langle\langle e,t\rangle,t\rangle \qquad \dfrac{\lambda z \qquad \dfrac{\dfrac{\dfrac{\mathbf{heino} : e \qquad \dfrac{\lambda x \lambda y.\mathbf{look\text{-}at}(x)(y) \blacklozenge \lambda x \lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(x)(y)) : \langle e,\langle e,t\rangle\rangle \times \langle e,\langle e,u^s\rangle\rangle \qquad z : e}{\lambda y.\mathbf{look\text{-}at}(z)(y) \blacklozenge \lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(z)(y)) : \langle e,t\rangle \times \langle e,u^s\rangle}}{\mathbf{look\text{-}at}(z)(\mathbf{heino}) \blacklozenge \mathbf{bad}(\mathbf{look\text{-}at}(z)(\mathbf{heino})) : t \times u^s}}{\mathbf{look\text{-}at}(z)(\mathbf{heino}) : t \bullet \mathbf{bad}(\mathbf{look\text{-}at}(z)(\mathbf{heino})) : u^s}}{\mathbf{look\text{-}at}(z)(\mathbf{heino}) : t}}{\lambda z \mathbf{look\text{-}at}(z)(\mathbf{heino}) : \langle e,t\rangle}}{\mathbf{every(girl)}(\lambda z \mathbf{look\text{-}at}(z)(\mathbf{heino})) : t}$$

The problem is that while for the at-issue part of *beglotzen*, the combination of a provisional introduction of the object argument and its later abstraction works as needed, the variable introduced by the trace remains unbound by the lambda operator in the UC dimension, because it is isolated by use-conditional application. This predicts that, in the UC dimension, (34) expresses a negative attitude regarding Heino's looking at $g(z)$, i.e., whatever referent is assigned to the variable z by the assignment function g. This is of course not the use-conditional content expressed by (34).[11]

Similar examples can be constructed for Japanese. (36) is a case of a simple quantified verbal pejorative; here, the subject is a quantificational noun phrase, and the pejorative morphology on the verb *-yagaru* distributes across every individual being quantified over. (37) involves object quantification of the same sort found in the previous example. For both these cases, the analysis involves the same sort of problem we have seen above: (36) results in a type clash and (37) in an unbound variable in the use-conditional part of the content. Both these situations are problematic.

(36) dono-seito-mo warai-**yagat**-ta.
∀-student-Q *laugh*-PEN-PAST
'All the students laughed.' • 'I view every student negatively.'

(37) keisatsukan-wa dono-yoogisha-mo naguri-**yagat**-ta
policeman *∀-suspect-Q* *hit*-PEJ-PAST
''The policeman beat all the suspects' • '(For each beating) that was bad'

Taking stock: The largely extended set of types and rules of $\mathcal{L}_{\mathrm{CI}}^{*}$ is able to account for most of the empirical data. However, a lot of $\mathcal{L}_{\mathrm{CI}}$'s initial appeal – its rather simple extension of the standard types and rules – gets lost under these new additions. Worse, the extended system still cannot handle some quantificational constructions. In the following, we'll argue that both "problems" can be solved by employing "true" multidimensionality.

[11] Note that pure type-raising approaches to object quantification face the same problem, since when the verbal pejorative applies to its two variables, the use-conditional part gets isolated, similar to what happens in (35). If one does not strip away the use-conditional content, one faces the problem already seen in the subject quantification case: that a one-dimensional quantifier is supposed to apply to a two-dimensional argument. This, of course, is something that is not licensed in $\mathcal{L}_{\mathrm{CI}}^{*}$.

6 Compositional multidimensionality

The three issues discussed above can be addressed if we reformulate $\mathcal{L}^*_{\text{CI}}$ in a truly multidimensional way. First note that $\mathcal{L}^*_{\text{CI}}$ is exhibit *interpretational multidimensionality*, as one may call it: Except for mixed-type expressions, the expressions of $\mathcal{L}^*_{\text{CI}}$ all have just one dimension and the multidimensionality is introduced by parsetree interpretation, which distributes expressions in a derivation into the two meaning dimensions. This contrasts with *compositional multidimensionality*, which serves as the key to reformulate the core ideas of $\mathcal{L}^*_{\text{CI}}$ in a way that can address the raised challenges. The basic idea of compositional multidimensionality is that every natural language expression can systematically be associated with all meaning dimensions. Therefore, during the composition, all dimensions are calculated at each step based on the dimensions of its daughters. As we will see, this enables a reduction of the type system and combinatoric rules. We call the resulting system $\mathcal{L}_{\text{TU}}$.[12]

Composition in $\mathcal{L}_{\text{TU}}$

The type definition for $\mathcal{L}_{\text{TU}}$ is rather simple, as it only distinguishes between truth- and use-conditional types and does not divide the latter into further subcategories.

(38) **Ordinary truth-conditional types**

a. e, s, t are truth-conditional types.

b. If σ, τ are truth-conditional types, so is $\langle \sigma, \tau \rangle$.

(39) **Use-conditional types**

a. u is a use-conditional type.

b. If σ is a type and τ is a use-conditional type, $\langle \sigma, \tau \rangle$ is a use-conditional type.

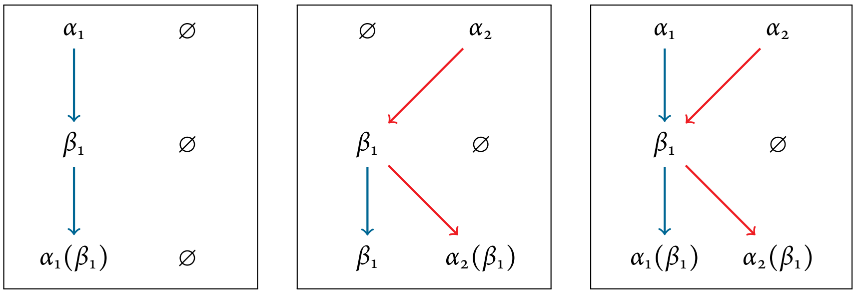
Each natural language expression is represented by a 3-dimensional semantic expression in a semantic proof tree. Every dimension consists of a typed logical expression. Officially, the expressions in the compositional multidimensional system are triples, but we will use the $\mathcal{L}^*_{\text{CI}}$ separators and write $\langle A, B, C \rangle$ as $A \blacklozenge B \bullet C$. The first dimension is the plain descriptive content (i.e., nothing with type u in it), while the third dimension is used to isolate satisfied use-conditional content (i.e., expressions of type u), where it can only be merged with other use-conditional propositions. The key component is the second dimension which functions like a kind of logging system that keeps track of expressions that are "active" for calculating use-conditional content. We call these dimensions the t-, s-, and u-dimension respectively. (The second and third dimension roughly correspond to what is behind the diamond and the bullet in $\mathcal{L}^*_{\text{CI}}$.)

To see how such a 3-dimensional approach can reduce the number of composition rules, let us first recast the rules of $\mathcal{L}^*_{\text{CI}}$ in a 3-dimensional way. We start by focusing on the first two dimensions. In Figure 3, we employ arrow diagrams to graphically illustrate the flow of information between the t- and s-dimensions.

As these diagrams make clear, under a multidimensional view of this sort, simple (=expletive) use-conditional application can be viewed as a special instance of mixed application, namely if α_1 is an identity function. This is illustrated in Figure 4.

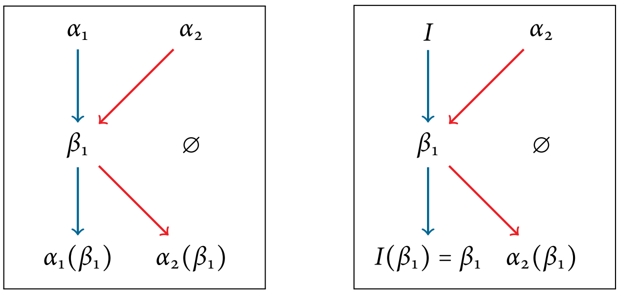
At this point, we have reduced three rules to two. However, we think we can do even better. The key to achieve this lies in the second dimension of the argument expression.

[12] The *TU* in $\mathcal{L}_{\text{TU}}$ alludes to the fact that the framework makes use of both truth- and use-conditional types. As such, $\mathcal{L}_{\text{TU}}$ is a particular formulation of the general idea of so-called *hybrid semantics* (Gutzmann 2015).



(a) Functional application (b) Use-conditional application (c) Mixed application

Figure 3: Composition of the first and second meaning dimensions in 3-dimensional $\mathcal{L}_{\text{CI}}^{*}$



(a) General use-conditional application (b) Expletive UC application

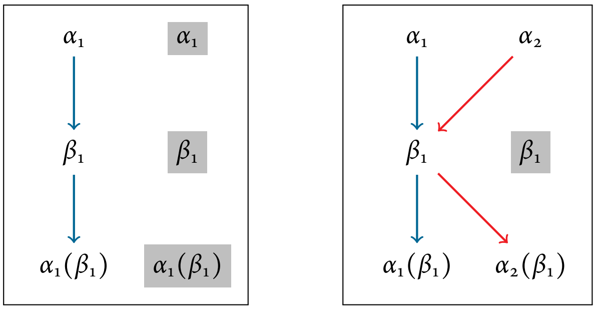
Figure 4: Expletive use-conditional application as an instance of general use-conditional application

Looking at the schematic visualization of functional application in Figure 3(a) and general use-conditional application in Figure 4(a), we see that the argument's s-dimension does not play a role in any of the two applications.[13] Furthermore, it is always the t-dimension of the argument to which both dimensions of the functional expression apply. Now let us employ the following trick. Instead of using the empty set for representing "empty" use-conditional content in the s-dimension of an expression, we instead use a copy of the first dimension. We do this for every empty s-dimension. In the case of ordinary functional application, the entire application is therefore replicated in the second dimension. For the moment, we leave the arrows untouched. For illustration, we put the copied material in gray boxes. We thus end up with the two schemata in Figure5.

Note that merely copying the truth-conditional content to the s-dimension does not affect the composition in any meaningful way, because the places to which we have copied material do not play any role in the application schemata. No gray box is connected to anything else.[14]

[13] That is not to say that it is irrelevant for the application rules. Quite the contrary. It constrains the use of the application to just those cases in which the s-dimension of the argument is empty.

[14] Again, even if the content in the grey boxes does not actively take part in the functional applications inside the entire application rule, it constrains the use of the schema to instance in which the s-dimension is as given by the boxes.



(a) Functional application (b) General use-conditional application

Figure 5: Composition of the first two meaning dimensions with non-empty dimensions

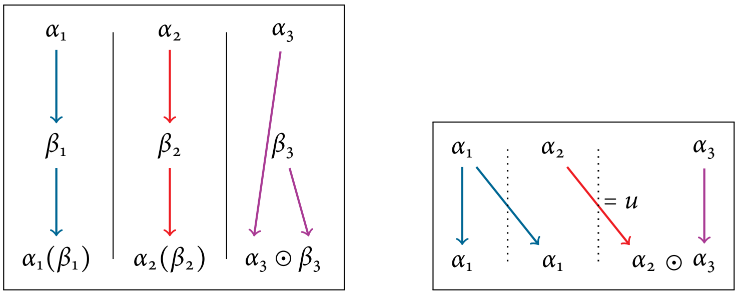
Comparing the two schemata resulting from the copy-trick reveals how this enables the unification of the two rules. What happens in the t-dimension is the same as before the copying trick. In the s-dimension, we see that the sole difference is that the function's s-dimension may differ from the t-dimension in case of expressive application, while it has to be the same in functional application. This also transfers to the outcome of the application. Now, if the function's s-dimension in expressive application happens to be the same as its t-dimension (i.e $\alpha_2 = \alpha_1$), then the schema for expressive application reads the same as the one for ordinary functional application. That is, functional application can be understood as a special case of general expressive application, namely one in which the function's s-dimension is a copy of its t-dimension. This maneuver then opens up an additional possibility for simplification. Note that if we were to employ general expressive application as in Figure 5(b) as the most general rule, the s-dimension of the argument would still remain unused. However, since it happens to be a copy of the t-dimension, we can equally assume that the function's s-dimension applies to the s-dimension of the argument, instead of the t-dimension. That is, we can have a entirely *intra*-dimensional application, instead of the *trans*-dimensional application that so far has been the hallmark of the second dimension, since $\mathcal{L}_{\text{CI}}$. Of course, this is currently nothing more than an aesthetic advantage. However, it also allows us to subsume also use-conditional modification by relaxing the requirement that the s-dimension of the argument is a copy of its t-dimension.

The new visual illustration for the resulting single, generalized rule for what can be called multidimensional application is given in Figure 6(a). For completeness, we have also added the composition of the third dimension, which has been put aside during the present reformulation. In addition to the application rule, we also need a new multidimensional elimination rule, which empties the s-dimension by copying saturated use-conditional content to the third dimension (where it merges with other use-conditional propositions by means of the use-conditional conjunction $\odot$) and copying the t- to the s-dimension.

Leaving the arrow diagrams, these rules can be stated in the proof-style notation as follows.

(40) **Multidimensional application**

$$\frac{\alpha_1 : \langle\sigma,\tau\rangle \blacklozenge \alpha_2 : \langle\rho,\nu\rangle \bullet \alpha_3 : u \qquad \beta_1 : \sigma \blacklozenge \beta_2 : \rho \bullet \beta_3 : u}{\alpha_1(\beta_1) : \tau \blacklozenge \alpha_2(\beta_2) : \nu \bullet \alpha_3 \odot \beta_3 : u}$$



(a) Multidimensional application (b) Unary use-conditional elimination

Figure 6: Composition with multidimensional application and unary elimination

(41) **Unary use-conditional elimination**

$$\frac{\alpha_1 : \sigma \blacklozenge \alpha_2 : u \bullet \alpha_3 : u}{\alpha_1 : \sigma \blacklozenge \alpha_1 : \sigma \bullet \alpha_3 \odot \alpha_2 : u}$$

6.1 Lexical extensions

If every lexical expression would correspond to a 3-dimensional expression, the lexicon would contain a lot of redundant information, since in most cases the missing dimensions can be deduced once we know one or two dimensions. However, if we want to keep the lexicon simple we need what we call *lexical extension rules* (LERs) that expand the lexical entries into proper 3-dimensional expressions that can be used in semantic derivations. This interface between lexical and derivational semantics allows us also to impose any desired restrictions, because, as stated so far, the system is quite liberal. In addition, the use of LERs allows us to account for cross-linguistic variation without changing the compositional system of the logic. If a language does not exhibit, say, mixed UCIs or use-conditional modifiers, its lexicon does just not possess the relevant LERs, so that such expressions could never enter the semantic composition. A subset of LERs for languages that do allow mixed UCIs as well as modification of expressive predicates (but not of expressive propositions) is given in (42). $\textsc{t}$ and $\textsc{u}$ range over descriptive and expressive types respectively. $I_\sigma = \lambda x_\sigma . x_\sigma$ is an identity function on expressions of type σ. The expressions T and U are dummy expressions for trivial descriptive and expressive content and both denote the set of all possible worlds. Therefore, $[\![\alpha : u \odot U]\!] = [\![\alpha : u]\!]$. The rule in (42)e uses the following convention: for every type α and each $n \geq 0$, $\alpha^n = \alpha$ if $n = 0$, and $\alpha^n = \langle \alpha^{n-1}, \alpha^{n-1} \rangle$ if $n > 0$.

(42) **Lexical extension rules**

a. *descriptive expressions:*
$A : \textsc{t} \Rightarrow A \blacklozenge A \bullet U$

b. *expletive UCIs:*
$A : \langle \textsc{t}, \textsc{u} \rangle \Rightarrow I_{\textsc{t}} \blacklozenge A : \langle \textsc{t}, \textsc{u} \rangle \bullet U$

c. *mixed UCIs:*
$\langle A : \langle \textsc{t}_1, \textsc{t}_2 \rangle, B : \langle T_1, U \rangle \rangle \Rightarrow A : \langle \textsc{t}_1, \textsc{t}_2 \rangle \blacklozenge B : \langle T_1, U \rangle \bullet U$

d. *shunting UCIs:*
$\langle \lambda x_{\textsc{t}} . T, A : \langle \textsc{t}, \textsc{u} \rangle \rangle \Rightarrow \lambda x_{\textsc{t}} . T \blacklozenge A : \langle \textsc{t}, \textsc{u} \rangle \bullet U$

e. *expressive modification:*
$A : \langle \textsc{t}, \textsc{u} \rangle^n \Rightarrow I_{\textsc{t}^n} \blacklozenge A : \langle \textsc{t}, \textsc{u} \rangle^n \bullet U$

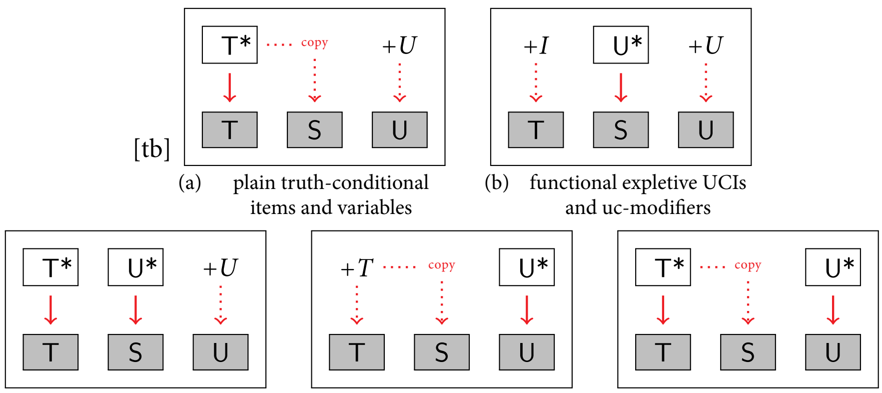
f. *variables*:
$x_{\textsc{t}} \Rightarrow x_{\textsc{t}} \blacklozenge {}_{\textsc{t}} \bullet U$

This set of LERs now allows us to state the following hypothesis about the lexicon, which the LERs link to the derivational semantics.

(43) **Hypothesis L²**
The lexical entries are at most two-dimensional. They may encode up to one truth-conditional and up to one use-conditional dimension.

According to this hypothesis, lexical entries can either encode (i) just truth-conditional content, (ii) just use-conditional content, or (iii) both. Crucially, they cannot have two different use-conditional dimensions, in contrast to the 3-dimensional objects produced by the LERs, which distinguish between the s-dimension and the u-dimension. Intuitively, this makes sense, as the distinction between these two dimensions is a matter of the composition and not a question of different kinds of content. That the three dimensions do not line up perfectly with the conceptual difference between truth- and use-conditional content is also shown by the fact that the s-dimension may also contain truth-conditional content. That is, the two dimensions that may be given by a lexical entry are not the same dimensions as the dimensions that we find in their 3-dimensional extensions. We call them therefore the t*-dimension and the u*-dimension respectively. The different ways in which these two *lexical dimensions* are distributed into the three *compositional dimensions* by the various LERs is illustrated in Figure 7.

[tb]



(a) plain truth-conditional items and variables
(b) functional expletive UCIs and uc-modifiers
(c) functional mixed and shunting UCIs
(d) isolated expletive UCIs
(e) isolated mixed UCIs

Figure 7: Relation between lexical and compositional dimensions

6.2 Cross-dimensional quantification

With this system in place, we now only need one additional component to solve the problem of cross-dimensional quantification. What we need is a type shifter to transform an ordinary quantifier into a mixed quantifier that can apply to both dimensions.

(44) $\dfrac{Q : \langle\langle e,t\rangle,t\rangle}{\star Q : \langle\langle e,u\rangle,u\rangle}$ where $[\![\star Q]\!]$ = the function $f \in D_{\langle\langle e,u\rangle,u\rangle}$ such that for every $E \in D_{\langle e,u\rangle}$, $f(E) = \{c \in C : \{x \in D_e : E(x)(c) = 1\} \in [\![Q]\!]\}$.

With this type shifter in place, we can finally provide a derivation of the problematic case.

(45)

$$\dfrac{\dfrac{\dfrac{\dfrac{\textit{Everybody}}{\mathbf{evby} : \langle\langle e,t\rangle,t\rangle}}{\begin{array}{c}\blacklozenge\ \star\ \mathbf{evby} : \langle\langle e,u\rangle,u\rangle \bullet U \\ \mathbf{evby} : \langle\langle e,t\rangle,t\rangle\end{array}} \quad \dfrac{\dfrac{\textit{goggles at}}{\begin{array}{c}\blacklozenge\ \lambda x\lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(x)(y)) : \langle e,\langle e,u\rangle\rangle \bullet U \\ \mathbf{look\text{-}at} : \langle e,\langle e,t\rangle\rangle\end{array}} \quad \dfrac{\dfrac{\dfrac{\dfrac{\textit{that damn}}{\mathbf{bad} : \langle e,u\rangle}}{\begin{array}{c}\bullet U \\ \blacklozenge\ \mathbf{bad} : \langle e,u\rangle \\ I_e\end{array}} \quad \dfrac{\dfrac{\textit{Heino}}{\mathbf{k} : e}}{\begin{array}{c}\bullet U \\ \blacklozenge\ \mathbf{k} : e \\ \mathbf{k} :\end{array}}}{\mathbf{k} : e \blacklozenge \mathbf{bad}(\mathbf{k}) : u \bullet U}}{\mathbf{k} : e \blacklozenge \mathbf{k} : e \bullet \mathbf{bad}(\mathbf{k}) : u}}{\mathbf{look\text{-}at}(\mathbf{k}) : \langle e,t\rangle \blacklozenge \lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(\mathbf{k})(y))\langle e,u\rangle \bullet \mathbf{bad}(\mathbf{k}) : u}}{\mathbf{evby}(\mathbf{look\text{-}at}(\mathbf{k})) : t \blacklozenge \star\mathbf{evby}(\lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(\mathbf{k})(y)))u \bullet \mathbf{bad}(\mathbf{k}) : u}}{\mathbf{evby}(\mathbf{look\text{-}at}(\mathbf{k})) : t \blacklozenge \mathbf{evby}(\mathbf{look\text{-}at}(\mathbf{k})) : t \bullet \mathbf{bad}(\mathbf{k}) : u \odot \star\mathbf{evby}(\lambda y.\mathbf{bad}(\mathbf{look\text{-}at}(\mathbf{k})(y)))u}$$

Given the need for the rest of the machinery, the extension required to handle multi-dimensional quantification is minor, and strikes us as a satisfactory account of the phenomenon. to

7 Conclusion

This paper has considered some problems that arise for existing theories of expressive content when faced with quantification into pejoratives. We presented a reformulation of $\mathcal{L}^{*}_{\text{CI}}$ that exhibits compositional multidimensionality, which enabled us to use just two composition rules and two kinds of types, while also solving the quantification problem. We take this to be a success story. Of course, the complexity of the data must be accounted for somewhere; in the new system, this is done by lexical extension rules that serve as the bridge between a at most 2-dimensional lexicon and the 3-dimensional derivational semantic system. We believe that there are many other empirical domains in which the resulting system can provide useful and insightful analysis.

However, we wish to close here on a slightly different note. In this paper, we have partly neglected the pejorative aspect of pejoratives; we have mostly put aside their exact denotations, limiting ourselves to some discussion of how a use-conditional analysis can be motivated. However, for a full analysis of pejoratives (and use-conditional content in general) a much more specific proposal will be necessary. The philosophical analyses we have cited strike us as bringing us closer to the heart of the matter. Still, none of them take into account one aspect of pejorative meanings which may be key in understanding their semantic and pragmatic function: the discourse effect of pejoratives. Consider what happens when a pejorative term – or a slur – is used: it both shifts the general tone of the discourse and has effects on the mutual beliefs of speaker and hearer about each other's attitudes (at least after the speaker observes the reaction of the hearer). This is much like what happens on the Potts and Kawahara analysis of (anti)honorifics; applying that analysis to slurs (as already suggested in §5) seems to us to be a useful and interesting future project, and perhaps the next step in this research program.

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