Vagueness & Discourse Dynamics

0.1 Preliminaries: Indeterminacy & Tolerance

Imagine a series of one hundred bottles of wine, where for $1 \leq n \leq 100$, the nth bottle in the series costs n dollars. Over objects in this series, predicative and attributive uses of the adjective 'expensive' exemplify a range of phenomena associated with vagueness. Of these, work in philosophy especially has tended to focus on two: **indeterminacy** and **tolerance**.

Indeterminacy: In response to the question 'Is bottle $^{\#}50$ expensive?', what a competent speaker knows about her language may fail to require that she answer affirmatively, and, likewise, fail to require that she answer negatively. Furthermore, there appears to be no additional (non-trivial) information which she could acquire about the series of bottles which would change her situation. This phenomenon is frequently described in terms of **indeterminacy**—that is, bottle $^{\#}50$ is neither determinately expensive nor determinately not expensive.

Under these conditions, we say that $^{\#}50$ is a borderline case. The knowledge speakers must possess to be competent fails to settle how borderline are to be classified. This goes observation beyond the previous one regarding what is required of speakers.

We can also make a stronger observation. The fact that a competent speaker is neither required to classify bottle $^{\#}50$ as expensive nor required to classify it as inexpensive does not by itself not settle how she is permitted to classify it. She might, after all, be required to make no classification. Yet indeterminacy appears to be also accompanied by permissiveness in use (for discussion, see e.g., Wright (1987, 244), Tappenden (1993, 553-561), Sainsbury (1996, §9), Fara (2000, 56), Shapiro (2006), Egré and Klinedinst (2010, 1), Gaifman (2010, 7), a.o.). Where $^{\#}50$ is borderline, in responding to the question 'Is bottle $^{\#}50$ expensive?' a competent speaker is permitted to answer affirmatively, permitted to answer negatively and permitted to decline to answer one way or the other. That is, speakers are at liberty to decide how borderline cases are to be classified if at all.

Tolerance: For every n: $1 \leqslant n \leqslant 100$, the corresponding instance of the schema in (1) appears hard to reject:

(1) If bottle $^{\#}n$ is expensive, then bottle $\#n{-}1$ is expensive.

The appeal of instances of (1) is attributable to the fact that 'expensive' is seemingly **tolerant** to minimal variation in price (Wright (1975, 333)). That is, it seems that any bottle which differs only marginally in price from an expensive bottle will be expensive itself.

However, while the instances of (1) are compelling, they are each classically inconsistent with the seemingly equally compelling (2)-(3):

(2) Bottle $^{\#}100$ is expensive. (3) Bottle $^{\#}1$ is not expensive.

From (2)—which says that a \$100 bottle of wine is expensive—and the instantiation of (1) with 100, we can obtain the claim that bottle $^{\#}99$ is expensive via *modus ponens*. Repeated applications of this procedure, along with the transitivity of entailment and double negation introduction, will yield the denial of (3). Yet, since (3) says that a \$1 bottle of wine is expensive, accepting its denial appears impermissible in any context.

Tolerance does not only manifest in judgments about conditionals like (1). Another product of tolerance is the apparent absence of sharp cutoffs. Instances of negated conjunctions, like (4), and disjunctions, like (5), also appear hard to reject:

(4) It's not the case that: bottle $^{\#}n$ is expensive but bottle $^{\#}n-1$ is not.

(5) Either bottle $^{\#}n$ is not expensive or bottle $^{\#}n-1$ is.

As above, the set of claims comprising the instantiations of (4) and the instantiations of (5) are each classically inconsistent with (2) and (3). That is, from the claim that bottle $^{\#}100$ is expensive and each of the instances of either (4) or (5), it is possible to classically derive the conclusion that bottle $^{\#}1$ is expensive, also.

The possibility of deriving a contradiction using classical resources makes unrestricted acceptance of the instances of (1), (4) and (5) controversial. Many theorists either claim that some instance involving borderline cases is false (e.g., Sorensen (1988, 2001), Williamson (1994), Fara (2000)),

or deny that any instance involving borderline cases is true (e.g, Fine (1975), Kamp (1975), Keefe (2000*a*,*b*)).

In contrast, it is uncontroversial that the instances of the converse schema should be accepted:

(6) If bottle $^{\#}n-1$ is expensive, then bottle $^{\#}n$ is expensive.

The appeal of instances of (6) is attributable to what Fine (1975, 270) terms **penumbral connections**. Such connections correspond to constraints on the ways in which indeterminacy can be resolved. They manifest (in part) in the existence of determinate complex expressions with indeterminate constituents.[1] For example, it may be indeterminate whether a 17-year old is a child, but determinate that they are not both a child and an adult. It may be indeterminate whether a shade of chartreuse is green, but determinate that it is either green or yellow. In the present case, while it is indeterminate which bottles in the series are expensive, it is determinate that any bottle which costs more than an expensive bottle will be expensive itself.

The majority of work on vagueness in philosophy has concentrated on issues related to tolerance and indeterminacy (either separately or, less frequently, simultaneously). In contrast, work in linguistics has frequently focused on vagueness within particular lexical categories, including, e.g., gradable adjectives (Klein (1980), Kamp (1975, 1981*b*) Barker (2002, 2003, 2013), Kennedy (2001, 2007, 2010), Kennedy and McNally (2004), Sassoon (2013)), nominals (Sassoon (2013), van Deemter (2010)), hedges (Pinkal (1983), Lasersohn (1999), Barker (2002, 2003)) and quantifiers (Ballweg (1983), Solt (2011)). The topic of this chapter marks one area in which the two fields have converged, with fruitful results.

[1] Note that not every determinate truth with indeterminate constituents need be the manifestation of a penumbral connection. The disjunction of any indeterminate sentence with a determinate truth is itself determinately true, and the conjunction with a determinate falsehood determinately false. Similarly, many theories of higher-order vagueness allow for the existence of sentences which are determinately indeterminate (though cf. Bobzien (2015)) — however, it is far from obvious that such determinacy corresponds to a constraint on the resolution of (lower order) indeterminacy.

0.2 Discourse Dynamics & Vagueness

As discussed above, permissiveness accompanies indeterminacy. In most discourse contexts in which it is indeterminate whether bottle $^{\#}50$ is expensive, a speaker may classify it as expensive, may classify it as not expensive, or may decline to classify it one way or the other.[2,3] However, the range of permissible uses of a vague expression is susceptible to change over the course of discourse. Using an expression can impose constraints on the way the same expression (or others related to it) can be employed in later, 'downstream' utterances.

This is most clearly revealed in the existence of discourses whose unacceptability cannot be attributed to the *prior* impermissibility of any particular constituent utterance. That is, we can identify sequences of utterances which are impermissible in context, despite the fact that each of their constituent utterances occurs in some sequence which would be permissible in the same context.

Recall that bottle $^{\#}n$ in the sequence costs n dollars. There are many naturally occurring contexts in which a speaker could permissibly perform the sequence of utterances in (7) or, alternatively, permissibly perform the sequence of utterances in (8):

(7) Bottle $^{\#}50$ is expensive... Bottle $^{\#}51$ is too.

(8) Bottle $^{\#}50$ is not expensive... Bottle $^{\#}51$ isn't either.

However, in any such context, it would be impermissible for the speaker to perform the sequence of utterances in (9):

(9) ?? Bottle $^{\#}50$ is expensive... Bottle $^{\#}51$ isn't, though.

Note that there is, at least initially, a permissible sequence (namely, (7)) in which $^{\#}50$ is classified as expensive, and a permissible sequence (namely, (8)) in which $^{\#}51$ is classified as not expensive. However, after $^{\#}50$ has been classified as expensive, it is no longer permissible for the speaker (or any other participant in a conversation in which the utterance has been mutually accepted) to classify $^{\#}51$ as not expensive.

[2] At least for present purposes, we can assume that classifying bottle $^{\#}n$ as (not) expensive involves nothing more than asserting the sentence ⌜ Bottle $^{\#}n$ is expensive⌝ (⌜Bottle $^{\#}n$ is not expensive⌝).

[3] In virtue of the penumbral constraints in force, however, there will be no discourse context in which she may classify it as both expensive and not expensive.

Indeed we can, also, make a stronger observation: after #50 has been classified as expensive (and the utterance has been mutually accepted), participants in the conversation are required to classify #51 as expensive, should the question arise. That is, they are no longer permitted to decline to classify #51 one way or the other.

The impermissibility of (9) appears attributable to precisely the same source as the determinacy of the instances of (6). Classifying a bottle as expensive involves a (partial) resolution of indeterminacy. The penumbral connections associated with the expression require that any bottle which costs more than a bottle classified as expensive also be classified as expensive. Using the expression imposes constraints on future use, constraints which may preclude uses which were previously permissible.

Discourse level effects do not only arise in virtue of penumbral connections, however. It also appears unacceptable for a speaker to perform the sequence of utterances in (10) in any context:

(10) ?? Bottle #51 is expensive... Bottle #50 isn't, though.

Again, note that there is, at least initially, a permissible sequence containing each constituent utterance as a sequence. However, after #51 has been classified as expensive, it seems no longer permissible to classify its predecessor as not expensive.

The impermissibility of the second utterance is attributable to the same source as the impermissibility of rejecting instances of (1). Since 'expensive' seems tolerant to minimal variation in price, it seems impermissible to classify as expensive any bottle which differs only marginally from a bottle classified as not expensive. To do so would be to commit to a sharp cutoff between the bottles which are expensive and the bottles which are not expensive—a cutoff of precisely the kind incompatible with tolerance.

Note, however, that the present case differs from it's predecessor in at least one respect. It is far from obvious that, after #51 has been classified as expensive, it would be impermissible to decline to classify #50 one way or the other. Instead, it appears coherent for an individual to answer the question of whether #51 is expensive positively, but nevertheless be incapable of coming to a decision regarding #50. Indeed this would seem to be precisely the situation of subjects in a so-called 'forced march' sorites series (Horgan (1994), Raffman (1994)). After classifying a bottle

as expensive, it remains indeterminate, it seems, whether bottles only marginally less expensive are not expensive—a positive answer is not required, despite a negative answer being prohibited.[4]

These observations combine to form a picture of the discourse dynamics of vague expressions. First, they suggest that features of the use of vague expressions are sensitive to context. The fact that there are contexts at which (7) would be permissible to utter but (9) would not (since it is unacceptable in every context) indicates that the permissibility of uttering a vague sentence can vary depending on the discourse context. In this case, the permissibility of classifying bottle $^{\#}n$ as not expensive varies depending on the context resulting from the speaker's first utterance (i.e., whether $^{\#}n-1$ was classified as expensive or as not expensive). Second, they suggest that features of the context are sensitive to the use of vague expression. In particular, the fact that (10) is impermissible to utter in any context suggest that classifying bottle $^{\#}n$ as expensive changes the discourse context so that for any $n' \geq n - k$, classifying bottle $^{\#}n'$ as not expensive is impermissible (where k is positive and, presumably, vague itself) and for any $n'' \geq n$, classifying bottle $^{\#}n''$ as expensive is required. Putting this together, use of vague expressions exhibits the two-way interaction between utterance and context constitutive of discourse dynamics.

0.2.1 Definites

Discourse-level effects are not limited to predicative uses of vague expressions. They can also be observed in the behavior of definites with a vague nominal complement.

Suppose that all but two bottles are removed, leaving only bottle $^{\#}40$ (worth \$40) and bottle $^{\#}60$ (worth \$60). In a context in which neither is determinately expensive or determinately not expensive, (11) can be used to communicate that the more expensive bottle is from a french vineyard.

(11) The expensive bottle is French.

[4] Note that, for this reason, it is not accurate to say that indeterminacy is sufficient for permissiveness in use. In a discourse context in which bottle $^{\#}n$ has been classified as not expensive, it may be indeterminate whether $^{\#}n + 1$ is expensive, but it will nevertheless not be permissible to classify it as expensive.

That is, the definite DP unambiguously denotes the more expensive bottle, despite the fact that both were borderline cases of 'expensive' prior to the utterance (for discussion, see Kyburg and Morreau (2000), Fara (2000), Kennedy (2007, 2010), Syrett et al. (2010)).

As Kyburg and Morreau note (2000, 581), it might be thought that this behavior could be explained away as referential use of the definite (Donnellan (1966), see also Kamp, this volume). However, two observations tell against this diagnosis. First, unlike with referential uses, the use of the definite in (11) does not require a singular intention. The speaker need not know that #60 is the more expensive of the pair—she could, for example, merely know that all of the bottles which were not removed are from french vineyards, while being ignorant of which bottles remain. Second, and more significantly, unlike referential uses of definites, the use of the definite in (11) has downstream effects on the discourse. After its utterance is accepted, it would be infelicitous to go on to deny that bottle #60 is expensive.[5]

Note that if adjacent bottles, like bottle #50 and bottle #51, are left instead, the same use of the definite is not available. That is, where the objects in the domain differ minimally, (11) cannot be used to communicate that bottle #51 is from a french vineyard(Kennedy, 2010, 77-79) (though cf. Barker (2013)). As Kennedy notes, this is peculiar to the positive form of the vague adjective. Use of the comparative, as in (12), to communicate the same information is unmarked:

(12) The more expensive bottle is French.

This contrast is, in one sense, easy to account for. The existence and uniqueness presuppositions of the definite conflict with the assumption that 'expensive' is tolerant. The latter entails that both #50 and #51 must be in the extension of 'expensive bottle' if either is, whereas the former requires that exactly one be in it. The comparative form, since it is not tolerant, generates no such conflict. However, the more fundamental challenge lies in accounting for the assumption that 'expensive' is tolerant.

[5] In contrast, one can felicitously respond to an utterance of 'The man drinking the martini is interesting' with the response 'Yes, but it's not a martini, it's a glass of water'.

0.3 Explaining Discourse Dynamics

A minimally adequate account of the discourse dynamics of vagueness will be required to answer two questions: I) how is the use of vague expressions dependent upon discourse context? and, II) how is discourse context dependent use of vague expressions? As we'll see in this section, philosophers and linguists have provided a range of answers, which can be combined in a number of different ways.

I. *How is the use of vague expressions dependent upon discourse context?*

Contextualism: A natural response to the context-sensitivity exhibited by vague terms is to attempt to assimilate them to an established class of context-sensitive expressions. **Indexical** variants of contextualism suggest that the content of vague expressions varies depending on some feature of the context of utterance (Soames (1998, 2002) Kennedy (2007, 2010) as well as, in places, Kamp (1981*a*, 242)). In this respect, it is proposed, they are comparable to, e.g., pronouns such as 'I', 'you', nouns such as 'local', 'today', or verbs such as 'come', 'go', etc.. In contrast, **non-indexical** variants of contextualism deny that the content of vague expressions varies across contexts. Rather, they claim that the evaluation of the content of an utterance containing a vague expression (e.g., it's truth value or assertability) varies depending on the context at which it is used (Fara (2000), and, arguably, Lewis (1979)). In this respect, the treatment of vague expressions is comparable to prominent treatments of tense and modality (e.g., Lewis (1980), Kaplan (1989), Ludlow (2001), MacFarlane (2009)).

Orthogonal to the indexical/non-indexical distinction, contextualist theories face a choice regarding the feature of context to which they take vague expressions to be sensitive. Some, such as e.g., Fara (2000) and Kennedy (2010), propose that vague expressions are sensitive to contextually determined purposes or interests. #50 might, for example, be correctly classified as expensive by a speaker with the purpose of buying a bottle for cooking, but as not expensive by a speaker with the purpose of buying a bottle as a wedding gift. Others, such as e.g., Lewis (1979), propose that the context of utterance fixes a standard of precision. Lewis takes the contextual standard of precision to determine whether the content of an utterance can be assessed 'true enough' for the purposes of assertion. However, we can also imagine an indexical variant, on which

the content of vague expressions vary as a function of the standard of precision.

Comparison Class Variance: Prepositional modifiers can affect the extension of gradable adjectives such as 'expensive', as exemplified by (13) (cf. Wheeler (1972)):

(13) Bottle #50 is expensive *for one of the* [*first/central/final*] *60 bottles*.

Whereas #50 is determinately expensive for a bottle in the cheapest 60 bottles of the series, it is determinately not expensive for a bottle in most expensive 60 bottles. This observation has led a number authors to suggest that the extension of a vague expression is always dependent upon some comparison class of objects (Kamp (1975), Klein (1980), Deemter (1996), Raffman (2005), Pagin (2010*a*,*b*)).

In (13), this comparison class is supplied overtly, by the complement of the *for*-PP.[6] Where there is no overt material to supply this class, it is supplied instead by an unarticulated constituents occurring at some level of representation in the sentence uttered.

Proponents of the view face a choice regarding the kind of unarticulated constituents they posit. One option is to posit a constituent which behaves like an unpronounced pronoun, the denotation of which is supplied by context (cf. Stanley (2000)). This version of the view can reasonably be seen as a sub-species of contextualism, above.

An alternative is to posit that the unarticulated constituent is not itself context-sensitive. Rather, at some level of representation, the unmodified 'Bottle #50 is expensive', has the same constituent structure as (13). The only difference is that the PP in the former is phonetically null. The only contribution of context, on this variant of the view, is as a guide for listeners in disambiguating which of a range of phonetically indistinguishable sentences was produced by the speaker.

Lexical Under-Determination and Micro-Languages: Another, contrasting, class of approaches take as their first component the idea that the lexical meaning of a non-complex vague expression fails to fully determine its content in a context of utterance. A common way

[6] It is often assumed that in attributive uses of gradable adjectives, a comparison class is fixed by the nominal complement (Wheeler (1972), Klein (1980), though cf. Kennedy (2007)).

of expressing this position is to claim that the meaning assigned to an expression in the lexicon can be made more precise in multiple, potentially incompatible ways (Fine (1975), Kamp (1981*a*) (in places), Bosch (1983), Pinkal (1983), Eikmeyer and Rieser (1983), Tappenden (1993, 1995), Shapiro (2006)).

Some of proponents of the approach have characterized lexical underdetermination in terms of Putnam (1975)'s notion of **stereotypes**. These stereotypes are comprised of a constellation of properties which, rather than directly determining the content of expression, serve as a defeasible guide to its extension. For certain sub-class of expressions (including many natural kind terms), content will be fully fixed by mind-independent factors. However, according to proponents of this approach, for a large portion of the language (namely, that portion which is vague) the combination of stereotype and mind independent factors will be insufficient to determine precise content in context (Kamp (1981*a*)[131-2], Eikmeyer and Rieser (1983, 137)). Others have appealed to the, perhaps related, notion of **open texture**, due to Waismann (1951). An expression exhibits open texture insofar as, no matter what stipulations are introduced to determine its content, the extension of the expression remains underdetermined by its conventionally associated meaning (Tappenden (1993, 1995), Shapiro (2006)). Whereas appeal to stereotypes often functions of an explanation of the behavior of a vague term, appeal to open texture is better seen as a description of that behavior.

The second component which must be specified is the mechanism by which context can serve to reduce or modulate the imprecision arising from the lexical meanings of a vague expression. Here, many proponents of the approach have appealed to a view akin to that espoused in Ludlow (2001). Within a particular discourse, Ludlow suggests, interlocutors co-ordinate on more or less precise **micro-languages**—'modulations' of the meanings of terms, which serve to resolve otherwise problematic indeterminacy. This co-ordination may be either explicit or tacit, and is assumed to occur continuously over the course of a conversation, in accordance with the needs of the speakers. Thus, vague expressions are taken to be sensitive to discourse context in virtue of the fact that their content will vary according to the particular micro-language being spoken by the conversational participants at a given time.

II. *How is discourse context dependent on the use of vague expressions?*

Attention/Salience: A number of authors have proposed that the

content of vague expressions in context shifts in response to changes in individuals attention or in what objects are salient in the conversation (Raffman (1994, 1996, 2005), Fara (2000), Kennedy (2007, 2010)). This shift in content could be attributed to a change in the salient comparison class (Raffman (2005)), a change in what is required to 'stand out' from that class (Kennedy (2007, 2010)) or a change in the interests of speakers in response to shifts in salience (Fara (2000)). On each alternative, however, the use of a vague expression shifts the discourse context only indirectly. Classifying, e.g., bottle $^{\#}50$ as expensive makes salient/draws attention to that bottle. This change in salience/attention, in turn, gives rise to a change in the discourse context. Yet it is only in virtue of the fact that utterances are liable to affect the attention of interlocutors that they can have a downstream affect on later use of vague expressions.

This form of approach is able to explain the appeal of instances of (1). Uttering an instance of the conditional draws attention to the relevant pair, resulting in a shift to a context at which both the antecedent and consequent have the same truth-value. The appeal of quantified claims, like (14)), is harder to explain, since it does not draw attention to any particular pair of bottles.

(14) Any bottle \$1 cheaper than an expensive bottle is expensive.

Proponents have tended to claim that agents accept the universal generalization in virtue of the fact that each of its instances *would* be true in context, if uttered.

The dynamic behavior of definites discussed in §0.2.1 is harder to explain. It is far from clear how an utterance of (11) could result in a change in attention/salience that ensured $^{\#}60$, but not $^{\#}40$, determinately belonged to the extension of 'expensive'. This worry is particularly acute given that the context shift triggered by (11) is insensitive to whether speakers are antecedently attending to the pair $\langle ^{\#}40, ^{\#}60\rangle$.

Acceptance/Accommodation: An alternative strategy is to assimilate the effect of vague language use on discourse to a more general mechanism. Adopting the terminology of Stalnaker, mutual **acceptance** of an utterance results in the addition of its content to the **common ground**—the set of propositions jointly recognized by participants to be established for the purposes of the conversation Stalnaker (1970, 1973, 1974, 2002). This has an observable effect on the felicity of later uses of, e.g., presupposition triggers, modals and discourse particles. A number

of authors suggest that downstream effect of the use of vague expressions can be treated as a direct result of the acceptance of the utterance in which it occurs (Kamp (1981*a*), Soames (1998), Shapiro (2006)). Once it has been accepted that, e.g., #50 is expensive, participants tacit commitment to the tolerance of 'expensive' requires them to refrain from classifying #51 as expensive. Notably, this approach can remain neutral regarding whether the adjective is in fact tolerant to minimal variation of the adjective.

A closely related approach claims that downstream effects of the use of vague expressions is a by-product, rather than direct effect, of the acceptance of the utterance. The felicity of certain expressions, such as presuppositions triggers, imposes constraints on the common ground. Use of such expressions in a context which does not satisfy the relevant constraints can result in **accommodation**—the coercion of the common ground into one which conforms to the relevant constraints (Lewis (1979)). If it is assumed that the felicitous use of vague expressions imposes constraints on the common ground, discourse effects can be explained as the product of accommodation (Lewis (1979), Klein (1980), Kamp (1981*a*), Bosch (1983), Kyburg and Morreau (2000)). This approach has a particularly natural explanation of the behavior of vague definites. In virtue of its existence and uniqueness presuppositions, an utterance of (11) triggers accommodation of a common ground in which #60, but not #40, determinately belongs to the extension of 'expensive'.

Importantly, the two approaches are compatible. That is, it is possible to maintain that vague expressions have an effect on the discourse context via both the mechanism of acceptance and accommodation (this appears to be the position of, e.g., Kamp (1981*a*)).

Metalinguistic Dispute: A third way of characterising the effect of vague language use on discourse context is in terms of what Plunkett and Sundell refer to as **metalinguistic dispute** (Sundell (2011), Plunkett and Sundell (2013, 2014), Plunkett (2015)). Speakers' use of an expression can sometimes communicate, in addition to information about the world, metalinguistic information about the meaning of the expression in context (Stalnaker (1978), Barker (2002)). This can either take the form of information about the way the content of the expression is fixed in context, or information about its the context-invariant meaning. Crucially, Plunkett and Sundell contend, speakers frequently use words in this way to engage in tacit dispute "...wherein the speakers metalinguistic use of

a term does not simply involve exchanging factual information about language, but rather negotiating its appropriate use "(Plunkett and Sundell (2013, 15).

If vague expressions are sensitive to context (as proposed by contextualists, both **indexical** and **non-indexical**) or open to modulation in the development of microlanguages (as proposed by Ludlow (2001)), then they can be expected to be candidates for metalinguistic disputes. For example, in classifying #50 as expensive, a speaker may aim to communicate information about the cost of the bottle. Alternatively, they may be engaged in metalinguistic dispute, in which case they aim to tacitly co-ordinate with other speakers on a context or microlanguage in which #50 falls in the extension of 'expensive'.

This concludes our discussion of the possible mechanisms underlying the discourse dynamics of vague expressions. In the next (and final) section, I'll briefly propose some ways in which standard accounts of local context could combine with observations about the dynamics of vagueness to explain tolerance judgments like those discussed in §0.1.

0.4 Local Contexts & Vagueness

Discourse dynamics involve the two-way interaction between contexts and the expressions used in them. However, the context at which a constituent of a sentence is evaluated need not always coincide with the context at which the sentence itself is used. It is standard to distinguish between *global context* (the context at which the sentence containing an expression is evaluated) and *local context* (the context at which the expression itself is evaluated) (Karttunen (1974), Heim (1982, 1983, 1990)).

(15) a. John stopped smoking.
b. If John used to smoke, he stopped.

Presuppositions triggers, such as 'stop', are sensitive to context. For an expression containing a trigger to be licit, the trigger's presupposition must be satisfied in the context at which it is evaluated (Stalnaker (1973, 1974), Karttunen (1974), see also Abrusán, this volume). However, a discourse context which fails to license (15.a) may nevertheless license (15.b). This suggests that the local context at which expressions in the

consequent of a conditional are evaluated is not the same as the global context at which the conditional is evaluated itself.

(16) a. It$_i$ is a spaniel.

b. Mary owns a dog$_i$ and it$_i$ is a spaniel.

Pronouns are also sensitive to context. For an expression containing a pronoun to be licit, the pronoun must be associated with an appropriate discourse referent in the context at which it is evaluated (Karttunen (1976), Kamp (1981*b*), Heim (1982)). However, a discourse context which fails to license (16.a) may nevertheless license (16.b). As with presupposition, this suggests that the local context at which expressions in the right-hand conjunct of a conjunction are evaluated is not the same as the global context at which the conjunction is evaluated itself.

Much work in linguistics and philosophy has focused on identifying how the local context of an expression is to be calculated from the global context along with its own syntactic environment. Such theories have two components. They must specify: (i) which constituents of an expression's syntactic environment are relevant to calculating its local context; and (ii) what the contribution of those constituents to the local context is.

Theories which build dynamic behavior into the semantics of the language have often been taken to be well-placed to offer a theory of local context (Heim (1982, 1992), Beaver (1992, 2001), Zeevat (1992), van Eijck (1993, 1994); for criticism of dynamic approaches, see Soames (1982), Schlenker (2008), Lewis (2014)). While they must (arguably) give a stipulative response regarding the first issue (though see Rothschild (2011)), dynamic approaches are able to offer an appealingly simple response to the second. The effects of clausal expressions on local context and on global context are calculated in exactly the same way. That is, on a dynamic approach, an expression's contribution in determining local context is simply its content: a function from one context to another.

The preceding discussion outlined a general picture of the discourse dynamics of vague expressions. According to this picture, classifying bottle $^{\#}n$ as expensive resulted in a new discourse context in which, for any $n' \geq n - k$, classifying bottle $^{\#}n'$ as not expensive is impermissible (and for any $n'' \geq n$, classifying bottle $^{\#}n''$ as expensive is required). It turns out that, when combined with an orthodox account of local context

for logical connectives, we can use this picture to develop an appealing explanation of certain key tolerance phenomena (§0.1).

As first observed by van der Sandt (1989, 1992), local contexts for presupposition triggers and anaphoric pronouns appear to be calculated in the same way. Accordingly, we will consider both when giving examples of orthodoxy regarding local contexts for connectives and quantifiers.

(17) a. If John used to smoke, he stopped.
b. If Mary owns a dog_i, it_i is a spaniel.

As we saw above, in (17.a)(=15.b), the presupposition of 'stop' is satisfied in its local context, even if it remains unsatisfied in the global context. Similarly, in (17.b), the indefinite in the antecedent can introduce a discourse referent on which the pronoun in the consequent is anaphoric. On this basis, the local context of the consequent of a conditional is generally assumed to be the local context of the conditional updated with the antecedent (Langendoen and Savin (1971), Karttunen (1973, 1974), Gazdar (1979)).[7]

Turning to the case of vague expressions, the local context of the consequent of (18) (=(1)), is the global context updated with the claim that bottle $^{\#}n$ is expensive.

(18) If bottle $^{\#}n$ is expensive, then bottle $\#n{-}1$ is expensive.

In the context resulting from the claim that bottle $^{\#}n$ is expensive, it is impermissible to classify bottle $^{\#}n-1$ as not expensive. So, at least on the assumption that we judge it impermissible to reject a conditional as long as it is impermissible to reject its consequent in its local context, this will explain why individuals are reluctant to reject any instance of (18).

Similar remarks extend to conjunction and disjunction:

(19) a. John used to smoke and he stopped.
b. Mary owns a dog_i and it_i is a spaniel.

(20) a. Either John never smoked or he stopped.

[7] Where the conditional is unembedded, its local context will coincide with the global context; where it is embedded, however, the two may come apart.

b. Either Mary doesn't own a dog_i or it_i is a spaniel.

On the basis examples like (19.a)-(19.b), the local context of a right-hand conjunct is generally assumed to be the local context of the conjunction updated with its left-hand conjunct.[8] Similarly, on the basis examples like (20.a)-(20.b), the local context of a right-hand disjunct is generally assumed to be the local context of the disjunction updated with the negation of its left-hand disjunct. (NB: the case of anaphoric expressions in disjunction, first discussed by Partee, is a bit more complex. See, in particular Simons (1996) and Dekker (1999) for discussion.)).

(21) a. It's not the case that: bottle $^{\#}n$ is expensive but bottle $^{\#}n-1$ is not.

b. Either bottle $^{\#}n$ is not expensive or bottle $^{\#}n-1$ is.

Accordingly, the local context of the right-hand conjunct of (21.a) (=(4)), will be the global context updated with the claim that bottle $^{\#}n$ is expensive. Given standard assumptions about negation, the same holds for the right-hand disjunct of (21.b) (=5). Assuming a negated conjunction is judged permissible to reject only if it is permissible to accept each conjunct in its local context, we can explain our judgments about (21.a). And, assuming a disjunction is judged permissible to reject only if it is permissible to reject each disjunct in its local context, we can equally explain our judgments about (21.b).

By considering the local context of vague expressions, observations about tolerance at the level of discourse (exemplified in, e.g., (10)) can be extended to explain judgments at the sentential level, in cases involving conditionals, conjunction, and disjunction. This clearly falls far short of a complete theory of tolerance-related phenomena. In particular, absent an account of how discourse dynamics and local context should be reflected in the logic of a vague language, we still lack a solution to the sorites (and sorites-adjacent) puzzles. Nevertheless, we may hope that these kinds of issues can help to guide our choices developing in such an account. Authors such as Kamp (1981*a*), Bosch (1983), Ballweg (1983), Kyburg and Morreau (2000), Barker (2002), Shapiro (2006) and Gaifman (2010) serve as examples of the potential fruitfulness of this approach.

[8] It is also generally assumed that the local context of the left-hand conjunct coincides with the local context of the conjunction (for recent discussion, see Schlenker (2008), Chemla and Schlenker (2012), Mandelkern et al. (forthcoming), Mandelkern et al. (2020)) amongst others).

0.5 Conclusion

The discourse-level phenomena associated with vagueness raise a range of new questions. As I've aimed to show in this chapter, the process of answering these questions may bring with it the potential to address ostensibly independent, traditional questions about vagueness. Having introduced the key phenomenon in §0.2, in §0.3 we looked at various approaches which could, in combination, account for the two way interaction of vague utterances and context. Finally, in §0.4, I proposed one way to extend these considerations to the inter-sentential case, by appealing to features of local context.

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