

Why are some gradable adjectives—like *tall*—vague, while other gradable adjectives—like *empty*—are not? To answer this question, we must look to Congress.

We look not to its laws, but to its voting patterns. This paper applies social choice theory, the branch of economics concerning aggregated preferences, to linguistic accounts of vagueness. Social choice theorists noted long ago that cycles (or intransitivities, e.g. A is preferred to B is preferred to C is preferred to A) may arise in a decision-making body like Congress whenever such a body tries to choose among three or more options (Arrow 1951). Surprisingly, the same results obtain whenever a single individual aggregates multiple criteria into a single decision (Arrow and Reynaud 1986). This paper explains vagueness as a result of cycle-avoidance in language use. Specifically, vagueness is a strategy for avoiding cycles when using predicates, like *tall*, that invoke multiple criteria in their semantics.

Cycles paralyze decision making, so Congress and individuals should avoid them. However, Arrow’s Impossibility Theorem shows that, under minimal assumptions, avoiding cycles is impossible (Arrow 1951). Arrow suggested four weak assumptions for ensuring rational decision making in a collective body and, later, in individual decision making. For voters and candidates, these assumptions, in simplified form, are (1) **Range**: voters may order the candidates in any way; (2) **Unanimity**: if all voters prefer one candidate, the final decision should reflect this; (3) **Independence of irrelevant alternatives**: in deciding between two candidates, voters should evaluate those candidates without regard to other candidates that might be introduced later; and (4) **Nondictatorship**: one voter’s preferences shouldn’t override the preferences of other voters. For an individual making a multicriterial decision, replace ‘voter’ with ‘criteria’ and ‘candidate’ with ‘alternative.’ (For the technical spell-out of these assumptions, see (Arrow and Raynaud 1986:18-21).)

Multicriterial decision making is evident in the semantics of so-called ‘multidimensional’ gradable adjectives, like *clever* (see Egrè and Klinedinst 2011:10; Sassoon 2011). An adjective like *clever* might involve multiple criteria like language skills and mathematical talent, and in such a case, the Arrowian assumptions are reasonable: an individual should be ranked independently—and without constraint—according to her language skills and her mathematical talent; if both language skills and mathematical talent weigh in favor of calling an individual ‘clever,’ she should be so-called; if the speaker is comparing the cleverness of A to the cleverness of B, the cleverness of C should not matter; and neither language skills nor mathematical talent should be the sole determinant of whether someone is ‘clever.’ Of course, these assumptions, and the attendant decision procedure, may be more or less conscious for an ideal speaker (see Arrow and Raynaud 1986).

This paper proposes to extend the multicriterial model to adjectives like *tall*. Assume, following (Klein 1980), that the possible descriptors for an individual are (T)all, (N)ot tall, and (U)nsure. Traditionally, an adjective like *tall* is taken to have only one dimension on which to rank the alternatives T, N and U, that of HEIGHT (Kennedy 2007). However, there are two such dimensions, each corresponding to a locus of context sensitivity. Drawing on evidence from implicit comparison, Kennedy provides the following semantics for *tall* in its positive form: $\llbracket tall \rrbracket = \lambda g \lambda x. g(x) \geq s(g)$. In this denotation, s is a context-sensitive function (with g the measure function denoted by the adjective) that (1) provides a standard of comparison (for present purposes, a contextually determined comparison class) and (2) ensures that the individual ‘stands out’ (in some contextually determined way) with respect to that standard. The two loci of context sensitivity are the comparison class and the

²'stand-out' relation, and these comprise the two criteria in the semantics of adjectives like *tall*.

To see how cycling may result from these two criteria, assume that each point of contextual sensitivity is a criterion in the decision-making procedure (that is, in the semantics of the predicate). In the utterance *John is tall*, the relevant alternatives for describing John are T, N, and U. Suppose John is in a class of four same-aged children. The heights of the children are as follows:

- (1) Child 1 (50cm)—————John (98cm)—Child 2 (99cm)—Child 3 (1m)

Let's say that the speaker, considering the relevant comparison class for John, cannot decide between the alternatives T and U. Designate this scenario $T \sim U$. Likewise, the speaker cannot decide between the alternatives U and N: $U \sim N$. However, given the alternatives T and N and John's relevant comparison class, the speaker chooses $T > N$. Now assume that the 'stand out' relation, another criterion, strictly ranks the alternatives $N > U > T$. That is, John definitely does not 'stand out' in a way that suggests he is tall.

Thus, in terms of the first context-sensitive criterion—the comparison class—the speaker prefers $T > N$. However, where the comparison class criterion is equivocal between U and N ($U \sim N$), the 'stand out' criterion ranks $N > U$. Similarly, where the comparison class criterion is equivocal between T and U ($T \sim U$), the 'stand out' criterion ranks $U > T$. So, if the 'stand out' criterion breaks the 'ties' created by the comparison class criterion, $N > T$. But the comparison class criterion ranked $T > N$. We have achieved an intransitivity—a cycle. (For a similar example, see (van Deemter 2010:47-51).)

The potential cycling in doubly context-sensitive adjectives pairs with another linguistic fact: 'relative' gradable adjectives like *tall* display vagueness, while 'absolute' adjectives like *empty* do not (Kennedy and McNally 2005; but see Burnett 2011). While the syntactic and semantic tests distinguishing relative from absolute adjectives are not crucial here, (Kennedy 2007)'s generalization is: absolute adjectives do not have the second contextually sensitive criterion, the 'stand out' relation. Notably, without multiple criteria, the decision-making procedure about whether to use an absolute adjective like *empty* is not subject to cycling.

These facts suggest that the phenomenon of vagueness arises as a mechanism to avoid cycling. Therefore, it only arises where the semantics of the adjective incorporates at least two criteria. First, vagueness avoids cycling by violating an Arrowian assumption, that of the Independence of irrelevant alternatives. Recall that cycles result when a decision-making procedure respects all of Arrow's assumptions; by violating an assumption, the decision-making procedure can preserve transitivity. As (van Rooij 2011) has recently pointed out in his discussion of PRAGMATIC GAPS, the addition of a third entity can affect the semantic judgment between two unrelated entities (van Rooij 2011:68-69). Thus, the violation of Independence, needed on other grounds for adjectives like *tall*, avoids cycling. Second, the need to avoid cycling does not arise for adjectives without multicriterial semantics; therefore, vagueness does not occur with these adjectives, *contra* the reasons given in (Kennedy 2007). This explains the relative/absolute adjective dichotomy with regard to vagueness.

Selected bibliography: Arrow 1951. *Social choice and individual values*. Arrow and Raynaud 1986. *Social choice and multicriterion decision-making*. Burnett 2011. Handout at SuB 2011. van Deemter 2010. *Not exactly*. Egrè and Klinedinst 2011. Introduction to *Vagueness and language use*. Kennedy 2007. Vagueness and grammar, in L&P. van Rooij 2011. Implicit versus explicit comparatives, in *Vagueness and language use*.