The semantics of approximation

In this talk, I will propose a scale-based semantic analysis for proximative adverbs like *almost* in English, *fast/beinahe* in German, *presque* in French, and others.

Earlier theories: The backbone of practically all current analyses for *almost* goes back to Sadock (1981) who proposed that *almost* is a relation between worlds *w* and propositions *p* such that almost(*w*)(*p*) iff

(i) there is a *w′* which is close to *w* such that *w′ |= p* (“proximal clause”)
(ii) *w |= ¬p* (“polar clause”)

The most elaborate version of this analysis is implemented in Rapp / von Stechow (1999) who discuss the scope-taking behavior of *almost* and its interaction (in German) with the subjunctive (see below). Other approaches, like Ziegeler (2000), Amaral (2006), Bordeira+Schwenter (2005) raise justified doubts against this analysis, but fail to offer an alternative which can seriously compete with the Sadock approach.

Criticisms:
(a) Status of negation: Sadock’s analysis implements the assumption that *almost* is a stronger variant of negation (*¬* *p*). This is intuitively unappealing, as *almost S* seems to make a positive contribution about *S*. Ziegeler (2000) takes up this issue and attempts to derive the polar clause as an implicature. However, unlike other implicatures, polar clauses can not be cancelled, which disqualifies her analysis while leaving the problem open.
(b) Status in Discourse: In discourse, the status of an assertion *almost S* differs dramatically from *not S*. *Almost S* can stand in for *S* in causal discourse relations, which *not S* never could. The following example rests on the fact that *almost swim* can, like *be able to swim*, a reason for Tom to enjoy the pool. *Not being able to swim*, in turn, is not a good cause.

Tom can almost swim. Therefore he will enjoy a day at the pool.
#Tom can not swim. Therefore, he will enjoy a day at the pool.

This observation, going back to Ducrot (1972), was taken up and empirically verified in Amaral (2006). Its proper analysis is tied to a satisfactory answer to the (a) problem and hence counts as open.
(c) Too many counterfactual possibilities: Sadock’s analysis predicts too many situations in which *almost S* should be true, while it intuitively is not. For instance, the sentence *I almost reached the president* is predicted to be true if I actually reached a person who almost was elected president. A full discussion of this effect has to take into account the scoping possibilities of Rapp/von Stechow, but even in a careful application of their analysis, such predictions can not be avoided.
(d) Scalarity: The felicity of an *almost S* sentence rests on a notion of gradual approximation to the state of affairs described by *S*. This requirement is particularly prominent in languages like German which distinguishes counterfactual and scalar uses of *fast* by subjunctive/indicative mood. Scalar uses require scalar approximation:

#John ist fast männlichen Geschlechts. (*John is almost a male’, indicative mood)

If a sentence uses *almost* and fails to refer to a state of affairs that can be gradually approximated, then it sounds marked. In this example, it is hard to conceive of gradual approximation of biological gender. While this effect is observed and commented on in Rapp/von Stechow, no part of their analysis comes up for this observation.

My approach: I propose a scale-based analysis of proximative adverbs of the type *almost/fast*. The basic idea is that *almost* can map any property *P* to a new property of being “*almost P*” just below *P*, relative to a contextually or conceptually salient scale. I assume that *almost* is a polymorphic operator that can combine with relations-in-intension *P* of arity zero, one, two, three etc. In the following, *x* stands for a vector of variables of length *n* ≥ 0.

\[ \text{almost } + \lambda x \lambda s P(s,x) \]
In order to apply, the operator requires a certain conceptual background.
(3) The context needs to provide a salient superproperty $\Pi$ of $P$: with $\lambda x, s P(s, x)$
$\subseteq \lambda x, s \Pi(s, x)$

(4) The speaker/hearer needs to perceive a natural order on $\Pi$: For any $a$, $b$, $c$
and $s$, $s'$, $s''$ such that $\Pi(s, a)$ and $\Pi(s', b)$ and $\Pi(s'', c)$:

$<a, s> < <b, s'> \land <b, s'> < <c, s''> \rightarrow <a, s> < <c, s''>

$<a, s> < <b, s'> \rightarrow -(<b, s'> < <a, s>)$

This order must rest on the intrinsic properties of the items compared.

(5) Maximality of $P$: for all $x$, $y$, $s$, $s'$: $P(s, x) \land \Pi(s', y) \rightarrow <y, s'> < <x, s>

If all these requirements are supported either by world knowledge or contextual background, almost can apply and maps $P$ to the following property:

(6) Meaning postulates for almost:

$\forall x, s [\text{ALMOST}(P)(s, x)] \rightarrow$

[MOST$<y, s'> (\Pi(s', y) \rightarrow <y, s'> < <x, s>) \land \forall <z, s''>(P(s'', z) \rightarrow <x, s' > < <z, s''>)]

('things that are almost $P$ are just below the $P$ range which is maximal with respect to the ordering on $\Pi$')

$\forall x, s [\text{ALMOST}(P)(s, x)] \rightarrow$

$\forall z, s'' (>x, s' < <z, s'') \land \neg P(z, s') \rightarrow \text{ALMOST}(P)(s', z)$

('the range of almost-$P$ things is convex')

A sentence like Ann was almost happy will be analysed as (2) almost combines with be happy; (3) the property is perceived as part of the property 'having some emotional state', which is (4) ordered from negative emotions to positive emotions. (5) The property 'be happy' occupies the maximum end with respect to this order. Against this background, almost maps be happy to the property of being in an emotional state which is just below 'happy' with respect to the degrees of 'feeling good'.

Predictions: Unlike Sadock's analysis, the present analysis does not assume that 'not $S$' is part of the assertion. The proposition not $S$ is simply a logical consequence of almost $S$. The properties almost $P$ and $P$ are mutually exclusive. (Ziegeler's failure to derive not $S$ as an implicature indicates that this assumption should not be given up.)

The proposal hence offers a solution to problem (a).

The analysis can explain why the proposition almost $S$ often can stand in for $S$ in causal links in discourse. The sentence almost $S$ does express a positive property and is not tantamount to denying $S$. The positive properties asserted are those which, often, can offer reason to act as if $S$ were actually true (= b).

The analysis explicitly rests on an ordering relation on certain domains. The requirement that these ordering relations be intrinsic to the ordered domain and not spuriously defined by marginal aspects of the state of affairs under consideration, will exclude spurious applications of almost like in the president example, and allows for a transparent account of the observed scalarity requirements (c. and d.).

As a final corollary, the polymorphic type of almost allows application to property concepts as well as propositions. This offers an elegant semantic basis for the mood distinctions in German: almost $S$ requires $S$ in the subjunctive mood if, and only if almost combines with the proposition $S$. Indicative mood is reserved for combination with properties $P$. This allows to account for the difference between G $Es$ hätte fast geregnet and $Es$ hat fast geregnet. ("it almost would have rained"/ "it almost rained").