On the Nature of Syntactic Categories:
A Corpus Study of “kind of” in American English

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The Mental Encoding of Syntactic Knowledge

Plan:
To bring both language processing data and language change data to bear on this problem.
Fact 1 of language change:

Words/collocations sometimes “jump” category:

<table>
<thead>
<tr>
<th>Language</th>
<th>Original Category</th>
<th>New Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kwa: Verb (‘say’)</td>
<td></td>
<td>Complementizer</td>
</tr>
<tr>
<td>German: Noun (‘way’)</td>
<td></td>
<td>Preposition</td>
</tr>
<tr>
<td>French: Noun (‘step’)</td>
<td></td>
<td>Negation Marker</td>
</tr>
<tr>
<td>Rama (Chibchan): Postp.</td>
<td></td>
<td>Complementizer</td>
</tr>
</tbody>
</table>

Grammaticalization (Meillet, 1912; Hopper & Traugott, 1993, 2003)
Fact 2 of language change:

When linguistic material “jumps category”, the ground is often subtly prepared ahead of time:

• Old English “gangen” (to walk/stride) bleaching Early Modern English “go”

• Ambiguous penchant prior to surge in future uses:

c. 1590 hark, the kings and princes….are going to see the Queen’s picture. Shakespeare, *A Winter’s Tale*, V ii.
Sketch of a Model

Similarity Space
Morphosyntactic Change and Phonological Reduction

Diachronic phonological reduction is often associated with loss of morphosyntactic boundaries:

“lord” < hlaf (‘loaf’) weard (‘ward’)

Reduction of “be going to”

It is going to/gonna rain.

Adeline is going to/*gonna Los Angeles.

Hypothesis: reduction is an indicator of morphosyntactic unity.
The case of American English

“kind of”

She found a new kind of grasshopper.

Noun Prep

He lett for no kind of thyng.

1490 K. Estmere 193 in Percy’s Rel.

His remark seemed kind of cavalier.

Adverb

I kind of love you, Sal---I vow.

1804 T. G. Fessenden. Original Poems 100.
Reduction of “kind of”

I kinda consider it an audit letter. (Adverb)

haven't seen those kinda numbers since dot.com (Noun Prep)

[Enron corpus]

Suggests that these two cases are both morphologically unitary.
BUT…

Writing is not always a good guide to phonology…
AND…

We found a big [pail[e]] rocks.

Where’s the hoe? [b [ae] k [e] the house.

The pronunciation of “of” as [e] in unstressed environments is widespread in English (e.g., Bell et al. 2003, 2009).

Therefore: cannot take this alone as diagnostic of morphological boundary loss in “kind of”.

Plan:

1. Historical trends in writing “kind of” as “kinda” during the past century.

2. Other distributional indications of unity between Noun Prep “kind of” and Adverb “kind of”.


4. Upshot: there is an emergent unity of Noun Prep and Adverbial “kind of”.
1. Historical trends in “kinda”
Corpora

Corpus of Historical American English (COHA)

4.0 x 10^8 words, year 1800 to 2000

Corpus of Contemporary American English (COCA)

4.1 x 10^8 words, year 1990 to 2010

Mark Davies, Brigham Young University
Rates of Occurrence of full Noun Prep and Adverb ("kind of") across COHA

Noun Prep

Adverb

$r_s = 0.97$

$r_s = 0.97$

Interpretation: Both full forms are gaining.
Full Adverb / (Full Adverb + Full Noun Prep)

$r_s = 0.86$
Rate of Occurrence of reduced Noun Prep and Adverb ("kinda") across COHA

Noun Prep

\[ r_s = 0.92 \]

Adverb

\[ r_s = 0.65 \]

**Interpretation:** Both reduced forms are gaining.
Adverb / (Adverb + Noun Prep)

kind of

kinda

Ni = 86 Nf = 7829 $r_s = 0.86$

Ni = 10 Nf = 250 $r_s = -0.84$

Interp: in each case, the dispreferred form gains over time, bringing N. Prep and Adv. distributionally closer.
2. Contemporary corpus distribution commonalities between Noun Prep and Adverb “kind of/kinda”
Approximation/Indefiniteness

Adverb:
Sure, it’s kind of cold [Enron]

Noun Prep:
…finding some kind of deal confirmation for these auditors [Enron]

Grant is using its profits as a kind of drought insurance [Enron]
Approximation/Indefiniteness

\[
\text{Count(“a”, “some”, “any”)/Count(all Det)}
\]

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<th>Construction</th>
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<th>COHA</th>
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<td>type of</td>
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<tr>
<td>Noun Prep kind of</td>
<td>0.34 ***χ² [N = 125459]</td>
<td>0.45 ***χ² [N=80049]</td>
</tr>
</tbody>
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Interpretation: Noun Prep “kind of” helps convey indefiniteness, akin to approximative semantics of Adverb “kind of”.
Morphosyntactic Unity of Noun Prep “kind of”

Adverb “kind of” is morphosyntactically unitary.

Noun Prep “kind of”:

These kind of apples are delicious.
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<tr>
<td>type of</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>kind of</td>
<td>0.018***</td>
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Morphosyntactic Unity (plural data)


1. THOSE KIND OF THINGS 137
2. THESE KIND OF THINGS 78
3. THOSE SORT OF THINGS 30
4. THOSE TYPE OF THINGS 29
5. THESE SORT OF THINGS 20
6. THESE TYPE OF THINGS 16
7. THOSE KIND OF GUYS 14
8. THOSE KIND OF COMMENTS 13
9. THESE KIND OF CASES 11
10. THOSE KIND OF QUESTIONS 11
3. Contemporary behavioral commonality between Noun Prep and Adverb “kind of” (preliminary results)
Method

Participants: 31 native English speaking undergraduates from the University of Connecticut

Materials: 16 critical items (+48 fillers): synthetic speech sentences employing the following “words” in Noun Prep environment:

<table>
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<th>kind of</th>
<th>brand of</th>
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<tbody>
<tr>
<td>kinda</td>
<td>branda</td>
</tr>
<tr>
<td>kinna</td>
<td>branna</td>
</tr>
<tr>
<td>kine</td>
<td>bran</td>
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Sample Stimuli
Judgment Results

kinna sig.
better than branna
Summary

Converging lines of evidence support the claim that “kind of/kinda/kinna” in Noun Prep and Adverbial environments are connected.

It is too strong a claim to say that they are one construction.

But their tendency to behave together requires explanation.
Revised View of Syntactic Structure

Noun Prep

kind of

kind of

kind of

kind of

kind of

kind of

house of

group of

Adverb

rather

somewhat

quite

quasi-stable mixed entities (see Smolensky, 2011)
Thanks!

RAs: Reed Helms, Emily Pakstis, Jeff Rodny, Kevin Semataska, Emily Szkudlarek

NIH/NICHD HD40353 Haskins Laboratories
Relationship of this proposed case of emergence to self-organized sentence processing

The coach smiled at the player tossed the Frisbee.

Die Tatsache, dass die Astronautin überrascht den Außerirdischen vom Mars entdeckte, erregte Aufsehen.

We were looking for a kind of climb-down or retraction.
SOPARSE