

Intro

- First, consider some new constructions:
 - (1) a. *The problem is, is that we can't find evidence.*
 - b. *The calender from which the photos come from, ...*
 - c. *Later, I am going to the shop and buy me a six pack.* ← GoToGo
- This talk will focus on (1c), the GoToGo construction.
- **The basic question:** How are new constructions, such as (1a-c) from Zwicky (2002:3), extended once the first instance has become part of the grammar (a speaker's and a population's)?

Seed Hypothesis (our interpretation of Zwicky, 2002)

New constructions develop in a population by extending from one (more proto-typical and frequent) use/lexicalization to other (less proto-typical and less frequent) uses/lexicalizations.

- So, what do we mean by proto-typical?
 - For the current purpose, the more similar to the seed an extension is, the more proto-typical it is.
 - The seed is the first established instance of the construction.
- While there is some evidence from corpus studies that supports the Seed Hypothesis *across speakers*, nobody has yet examined whether the Seed Hypothesis holds *within an individual speaker's grammar*.

- We present supportive evidence from a survey on the *GoToGo construction* (Zwicky, 2002; see (1c), and the next section) that the Seed Hypothesis also holds for *individual speakers*.
- This possibility raises the question of whether, for a given speaker (a) each extension of a new construction is either **in or out** at any given point of the development, or (b) there is reason to believe that new instances of a construction go through a period of **limited gradient acceptance** before they become fully grammaticalized.
 - We present evidence supporting scenario (b), i.e. that the *acquisition of constructional extensions is a gradient matter*.
- To sum up, the purpose of this talk is as follows:
 - **To present evidence** that the Seed hypothesis is also valid *within a speaker's grammar*.
 - **To discuss the consequences** for current theories of grammar.
 - **To illustrate a methodology** for getting enough data for a quantitative analysis of a developing construction that is not yet sufficiently represented in corpora.

The GoToGo construction

- First discussed in Zwicky (2002:3,4; cf. Staum, 2004 for an overview):
 - Progressive motional *go* + goal adverbial + *and* + base-form VP
- The seed: Some proto-typical occurrences of the GoToGo construction**
- (2) a. *We're going to the American people and tell 'em the truth...*
- b. *I am going to the sanatorium and get my wife and daughter and quit this place forever.*
- c. *Tomorrow you are going back to the store and apologize for stealing from him...*

(Google search results, cf. Staum, 2004)

- Distribution of GoToGo shows that it is not yet fully established:
 - Accepted by some subset of Americans, not confined to speakers of any well-known social or regional dialect¹
 - Definitely not a majority of American speakers
 - Virtually nobody considers it as acceptable as standard examples like

(3) *I'm going to the store to apologize to him.*

- Despite all this, examples are reasonably common and they turn up in movies, speech, etc. dating from the first half of the 20th century.

➤ Extensions:

- In this talk we consider two extensions of the basic GoToGo construction: examples with verbs other than *going* (as in (4) - (5), where the verbs are *coming* and *running*) and examples without locative complements (as in (6)).

Non-prototypical uses of GoToGo with *coming/running*

(4) *You need to respect your elders, sonny, or I'm coming to your house and revoke you, and your father's BMW priviledges.*

(5) *Hey I'm running to the store and grab a can of copenhagen.*

- cf. extension of quasi-serials to verbs other than *go* and *come*: *run*, *hurry*, etc.

Non-prototypical use of GoToGo without goal-complement

(6) *I worked on a little while longer and then I decided well, I'm going and get my Master's Degree. (Google results, 1/3/05)*

➤ **Our questions:**

- How acceptable are the different extensions exemplified in (4) - (6) compared to the seed?

¹ We have not noticed speakers of non-American varieties of English using it, but it's certainly possible that they do. Any information about GoToGo in non-American varieties is welcome!

- That is, does the Seed Hypothesis make the correct predictions about the acceptability of these extensions within *and* across speakers?

Predictions

➤ Seed Hypothesis:

- While supportive evidence has been provided for the claim that the Seed Hypothesis descriptively holds across speakers (e.g. Zwicky, 2002), **ultimately, the Seed Hypothesis makes claims about the grammar of individuals** (and it is because of *that* that the Seed Hypothesis holds descriptively across speakers).
- Careful wording of the Seed Hypothesis is necessary for predictions with regard to the grammar of individual speakers:

Seed Hypothesis (intra-speaker version)

Ceteris paribus, the more proto-typical a type of example, the more likely it is to be become grammaticalized by a speaker (i.e. become part of his/her grammar) as an extension of a new construction.

- If the Seed Hypothesis is supported, this raises the question of whether
 - (a) each extension of a new construction is either **grammatical or ungrammatical** at each given point of the development, or
 - (b) new instances of a construction go through a period of **limited gradient acceptance** before they become fully grammaticalized.
- Theories of grammar that treat grammaticality as categorical are in principle compatible with the Seed Hypothesis, but they **do not by themselves predict** a systematic relationship between the acceptance of the seed of a construction and the acceptance of an extension.
- On the other hand, models of gradient grammaticality together with the Seed Hypothesis would predict that *within each speaker the acceptability of a more proto-typical instance of a construction should be higher than the acceptability of a less proto-typical instance.*

Methodology & Procedure

- The methodological problem:
 - To investigate the extension of a new construction and, more particularly, whether this extension's acceptance is gradient, lots of data are necessary.
 - But, for new constructions, even larger corpora don't yield enough data.
 - Especially if one has to rely on syntactically annotated corpora (which are small), additional sources of linguistic information are necessary.
 - Acceptability judgments, if properly controlled, can provide a window into a speaker's grammar (Schütze, 1996; also for problems with acc. judgments).
- Several studies (e.g. Keller, 2000; Sorace & Keller, 2004) have successfully used Magnitude Estimation (Steven, 1975; introduced and tested for linguistic judgments by Bard et al., 1996) to assess gradient acceptability of linguistic structures.
 - Magnitude Estimation results have been shown to reliably replicate the results of more complex and expensive methodologies.
 - E.g., several Magnitude Estimation studies of binding (e.g., Keller & Asudeh, 2001; Jaeger, 2004) yielded the same off-line results as related eye-tracking experiments (e.g. Kaiser et al., 2004; Runner et al., 2000; Runner, 2003).
- Our procedure:
 - We used magnitude estimation to elicit gradient acceptability judgments on extensions of GoToGo.
 - 114 participants (from all over the USA) within 2-3 weeks
 - Magnitude Estimation acceptability judgment of 42 sentences (plus fillers).
- Here we focus on the two extensions mentioned above as in (4) - (6).
 - In order to show that three distinct levels of acceptability were discriminated by the subjects, we compare the "standard"

construction with the seed of the new construction as well as a less proto-typical extension.²

Three sentence types for the "Verb" extension:

- 1) I'm going to the beach to get a tan. (Standard)
- 2) I'm going to the beach and get a tan. (Prototypical GoToGo)
- 3) I'm coming to the beach and get a tan. (Non-prototypical GoToGo)

Three sentence types for the "Loc. Goal" extension:

- 1) I'm going to the beach to get a tan. (Standard)
- 2) I'm going to the beach and get a tan. (Prototypical GoToGo)
- 3) I'm going _____ and get a tan. (Non-prototypical GoToGo)

- We used the experimental software package WebExp 2.1 (Keller et al., 1998) for experiments on the WWW, which has several advantages:
 - **Cheap** (participation didn't result in payment), **fast** (once started, the software runs the experiment fully autonomously, cf. the brochure available with this handout for a feature list of WebExp), and **good coverage** (a non-random but large sample of people from all over the US participated).
 - WebExp has a built-in Magnitude Estimation mode.

² For examples of sentences used in the study and further details on the procedures followed for this experiment, please see the appendix to this handout.

Results

- *Across speakers:* Variants along both dimensions of extension were judged as predicted by the Seed Hypothesis.
 - Standard examples were judged more acceptable than GoToGo instances with the prototypical verb (*going*) and goal (directional PP), which were in turn judged more acceptable than non-prototypical instances with the extensions (*coming, running*) and (no goal): Overall $F_s > 675$, $P_s < 0.0001$ (pair-wise comparison: all $P_s < 0.05$).

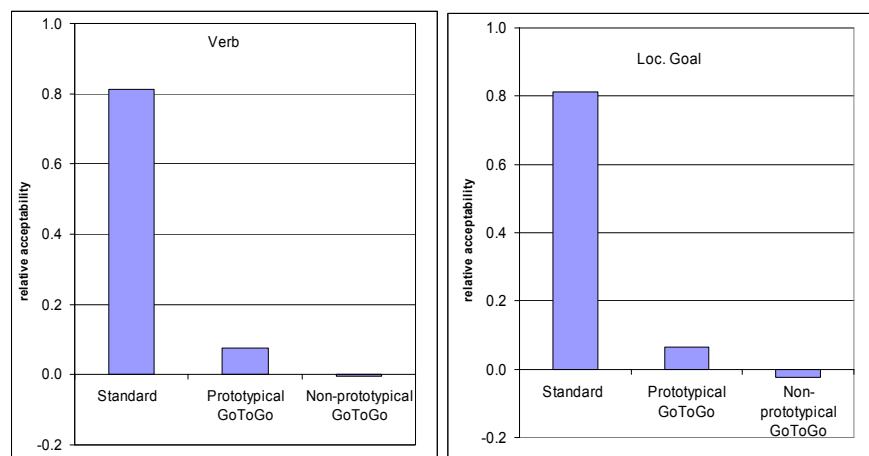


FIGURE 1 - Relative Acceptability of 3 Sentence Types – Verbs and Loc. Goals

- *Within speakers:*
 - As expected, virtually 100% of the speakers rated the standard construction higher than the new construction (GoToGo).
 - More crucially, for both dimensions of extensions (Type of verb, Type of goal-complement) a significant majority of the speakers preferred the more proto-typical pattern.
 - Even though neither the seed nor extensions of the GoToGo construction are judged fully grammatical, most speakers reliably judge the seed more acceptable than the extensions.

Seed	Extensions	Speakers preferring seed	Significance
Going	Coming, running	68%	$p < 0.0002$
PP Goal	no goal	73%	$p < 0.0001$

TABLE 1 - Percentage of speakers who rated more proto-typical examples higher

- This demonstrates that the Seed Hypothesis holds within speakers.

Summary & Conclusions

- The data we collected provides evidence for the **Seed Hypothesis within and across speakers**.
- That is, we have shown that proto-typical instances of GoToGo were judged *more acceptable* than less proto-typical uses.
- For many current theories of grammar, grammaticality of a construction is a binary categorical matter, a construction being either part of the grammar or not.
 - A study of developing syntactic constructions without a gradient notion of grammaticality models the extension of a new construction as the separate acquisition of each new pattern.
 - Such theories do not predict that a majority of speakers will reproduce the population's preference for less proto-typical examples and fail to distinguish among all patterns that are not fully acquired.
- Thus the relationship between different extensions of a construction is **easily captured by theories allowing gradient grammaticality of extending constructions**.
 - Without further explanation, theories in which grammaticality is a categorical matter fail to capture the phenomenon described above in which speakers and populations can clearly and consistently distinguish between the acceptability of a “bad” example and a “very bad” one.

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Appendix – Experimental procedure

 ➤ Subjects

- 114 participants from various parts of the U.S. (two of whom were excluded by an outlier analysis).
- A subset of subjects (47) whose judgments clustered together and seemed to accept some version of GoToGo were considered in the statistic analysis.

➤ Stimuli

- 42 Experimental stimuli compared to 1 reference sentence.
- A further 30 sentences were added as fillers

➤ The stimuli (examples):

- 1) I'm going to the beach and get a tan.
- 2) I'm going home and get an umbrella.
- 3) I'm going and get a hamburger.
- 4) I'm coming to the beach and get a tan.
- 5) I'm coming home and get an umbrella.
- 6) I'm coming and get a hamburger.
- 7) I'm running to the pool and go swimming.
- 8) I'm running home and get an umbrella.
- 9) I'm running and get a hamburger.
- 10) I'm going to the beach and getting a tan.
- 11) I'm going home to get an umbrella.

➤ Procedure:

- Acceptability judgments were obtained in an online experiment using the WebExp 2.1 software package (Keller et al., 1998).
- Judgments were elicited using Magnitude Estimation (Stevens, 1975), which has been shown to produce reliable results for linguistics acceptability judgments (e.g. Bard et al., 1996; Cowart, 1997; Keller & Asudeh, 2001; cf. Schütze 1996 for an overview of experimental methods to assess grammaticality).
- Before the experiment began, participants first worked through a training session and a practice session to familiarize them with the task.
- Between subject effects on **overall (filler included) mean normalized judgments** - sex, handedness, and age:
 - Women on average gave significantly more positive judgments overall (MEAN normalized judgment = 0.47; SE = 0.15) than men (MEAN = 0.38; SE = 0.15): $F(1, 109) = 5.9$; $p < 0.05$.
 - Handedness did not affect the mean judgment ($F < 1$).
 - Age showed a significant positive correlation ($r = 0.19$, two tailed $p < 0.05$) with mean normalized judgments, even after controlling for sex and handedness ($F(1, 109) = 5.1$; $p < 0.05$; Coefficient estimate $B = 0.002$).
- Between subject effects on **normalized judgments of GoToGo and GoInf stimuli** - sex, handedness, and age:
 - Basically, the same effects as for overall judgments (the sex effect is slightly reduced and only marginally significant) and the age effect is slightly stronger ($F(1, 109) = 17.2$; $p < 0.001$; $B = 0.005$) than for the overall judgments.
 - Unsurprisingly, overall judgments and judgments on our experimental stimuli were strongly correlated ($r = 0.9$; $p < 0.001$).
 - This suggests that the age effect on the overall judgments may be driven by the effect of age on judgments about the GoToGo and GoInf constructions (rather than an effect on the judgments on filler sentences). I.e. older people judged GoToGo more acceptable.
- Finally note that rather than introducing an arbitrary cut-off point on the acceptability scale (above which examples count as grammatical and below which they count as ungrammatical), we used a gradient acceptability scale.