Granularity shifting: Experimental evidence from adjectives and degree modifiers

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Experiment 1: Scalar Implicatures & Licensed Granularity Shifts

**Participants:** 25 native speakers of English per item.

**Methodology:** Truth Value Judgment Task, 5-points Likert scale: certainly not 1 2 3 4 5 certainly.

**Targets:** Slightly/a bit/somewhat + 17 Partial Adjectives; completely/entirely/perfectly + 17 Total Adjectives.

**Examples:**
- If A, MA, Minimizer (C1) Nick says that the room is dirty. Nick's mother thinks that it's slightly dirty.
- Would Nick agree that it's slightly dirty?
- If MA, A Minimizer (C2) Nick says that the room is slightly dirty. Nick's mother thinks that it's dirty. Would Nick agree that it's dirty?
- If MA, A, Maximizer (C3) Nick says that the table is clean. Nick's mother thinks that it's completely clean. Would Nick agree that it's completely clean?
- If MA, A, Maximizer (C4) Nick says that the table is completely clean. Nick's mother thinks that it's clean. Would Nick agree that it's clean?

**Questions:**
1. Implicatures: Is slightly dirty interpreted as 'at least slightly dirty and possibly dirty' (Maxim = 3) or 'at most slightly dirty' (<3)?
2. Lewis 1979: Is clean interpreted as 'at least clean and possibly completely clean (Maxim = 3) or 'at most clean' (<3)?

**Results:**
- Most answers are more than half a point above the scale middle 3 (so not in false fillers) > > implicatures ('at most slightly dirty', 'at most clean') are relatively minor.
- A two-way factorial anova for 2 blocks (partial adjectives with minimizers, total adjectives with maximizers) with 2 repeated measures (inference types) yields:
  a. adjective/modifier type effect (P<.0001): Total A >> Minimized partial A's, inference type effect (P<.0001): If MA, A >> If A, MA (fine to coarse >> coarse to fine).
  b. an interaction (P<.0001): The inference effect is stronger in maximized total A's.

**References:**

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Experiment 2: Level-of-fit Inferences

**Methodology:** Truth Value Judgment Task, 7-points Likert scale: certainly not 1 2 3 4 5 6 7 certainly.

**Targets:** Slightly/ completely + 30 adjectives of 5 types: Lower/Doubly-closed Partial, Upper/Doubly-closed Total, Relative.

**Examples:**
- If A, MA vs. If A, MA.
- Do minimizers refer to scale minimum or denotation minimum: X is slightly full => X is full? not full?
- Do partial /relative adjectives refer to points maximizers typically refer to: X is dirty = X is completely dirty?

**Examples of fillers:**
- TYPE 1: BOUND AND PRECISE NUMERALS (BOUND NUMBERS: 10 vs. 100 vs. 1000).
- Nick thinks he has 10 shirts. Nick's mother thinks he has 9 shirts. Did Nick agree that he has 9 shirts?
- Nick thinks that the temperature outside is 9.5°C. Nick's mother thinks it is 10°C. Did Nick agree that it is 10°C?
- TYPE 2: COMPARATIVE CONSTRUCTIONS WITH RELATED ADJECTIVES (TRUE OR FALSE).
- Slightly partial > Completely partial; Reversed inference effect for "slightly total".

**Procedure:**
- 120 target tests, 120 type-1 fillers, and 126 type-2 fillers; a randomized order except that each two target tests were separated by two fillers.

**Results:**
- Replicated; new predictions born out.
  a. Most answers are (much) above the scale middle – plausibly in the positive range.
  b. The level of fit: Minimizers slightly less sensitive to high degrees near/at the extension.
  c. An inference type effect (P<.0001): If MA, A >> If A, MA.
  d. Modifie r type effect (P<.0001): Minimized (completely) >> Minimizers (slightly).
  e. An interaction (P<.0001): Inference effect stronger in maximized A's. Not sig. 'slightly > > totally', as the peak of 'slightly total' is outside/total.

**Results fillers – Numerals:**
- Opposite inference effect (coarse to fine >> fine to coarse).
- Account (assuming upper bound interpretations): If 100 (“about 100”), we tend to agree that “99” (“exactly 99”), but if 99 (“exactly 99”), then not 100 (“exactly 100”).
- Still most answers are at scale middle and more (due to upper open readings).

This holds neither for false fillers, nor for “If 10”, “with” precise numbers too far from 10.

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Experiment 3: Entailment task: "If _ , does it follow that _ ? Prediction: Reduced peak effect Results Slightly partial > Completely partial; Reversed inference effect for "slightly total".

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Granularity shifting (cf. Lewis 1979; van Rooij 2011)

Default (coarse) granularity g: When using The car is dirty/clean it is normally appropriate to ignore almost invisible dirt. Pedantic (fine) granularity g: The car is completely clean/slightly dirty: Every dust grain counts.

∀g.g.e.Dg.g is finer than if 3.x.y.e.Dg.(g(x) ≠ g(y)) & (g(x) ≠ g(y)) & (g(x) ≠ g(y)) & (g(x) ≠ g(y)). For example, ∃ are in [1, 1] but in [0, 1].

[slightly] G2 = λx.C.g(x) > d2 for g finer than g, C ∈ [0, 1]. [completely] G1 = λx.C.g(x) = d1 for g finer than g, C ∈ [0, 1].