

# Conceptual effects in grammaticality judgments

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The study of concepts shows that entities are categorized under nouns—words like *tree*, *chair*, and *linguist*—based on addition or multiplication of their degrees in multiple dimensions.

With binary dimensions of equal weights, additive, but not multiplicative classification is equivalent to *quantification*: entities have to have sufficiently many (all/ most/ some) dimensions.

Multiplicative classification characterizes natural kinds (plants and animals; Hampton et al. 2010).

$$0 \times 1 \times \dots \times 1 = 0$$



Multiple **interrelated dimensions** —*shape, color, behavior, genetic layout, inner biological function, offspring nature*. A shift in one dimension is usually sufficient to justify classification under a different sub specie.

Additive classification characterizes mostly social concepts (artifacts and human traits).

$$0 + 1 + \dots + 1 \gg 0$$



**Independent dimensions** —Typically, a *linguist* works in linguistics departments, investigates languages, and reads Chomsky's work. But a person violating some of these features may well count as a linguist.

Adjectives—like *healthy, clean, active*—favor quantification (Sassoon 2012,2013)

$$0 + 1 + \dots + 1 \gg 0$$



**Independent dimensions** treated as **binary** (true-false) with **equal weights** (if relevant, then equally so).

To be **healthy** is to have **NO** disease.

To be **sick** is to have **SOME** disease.

**Safe**: NO danger; **Dangerous**: SOME danger.

**Prediction**: Additive nouns will be judged more felicitous (natural, acceptable) than multiplicative ones in adjective-selecting linguistic constructions (e.g., *more active* > *more a linguist* > *more a tree*).

**Results**: Domain (additive > multiplicative) is a main predictor of noun felicity in various constructions. Conclusions: Grammar is sensitive to conceptual structure.

## Predictors of morphological gradability: Syntactic category (Adj/N) or Conceptual structure?

**Participants**: 25 native speakers of English per item (AMT; 1 cent per hit ; 6.5\$ hourly rate).

**Methodology**: Naturalness Judgment Task, 5-points Likert scale: perfectly natural 1 2 3 4 5 perfectly unnatural

**Targets**: -10 Additive nouns, 10 Multiplicative nouns, 10 Multidimensional adjectives X Basic, Quantification (3), Comparison (3).

**Examples**: (prediction: a < b)

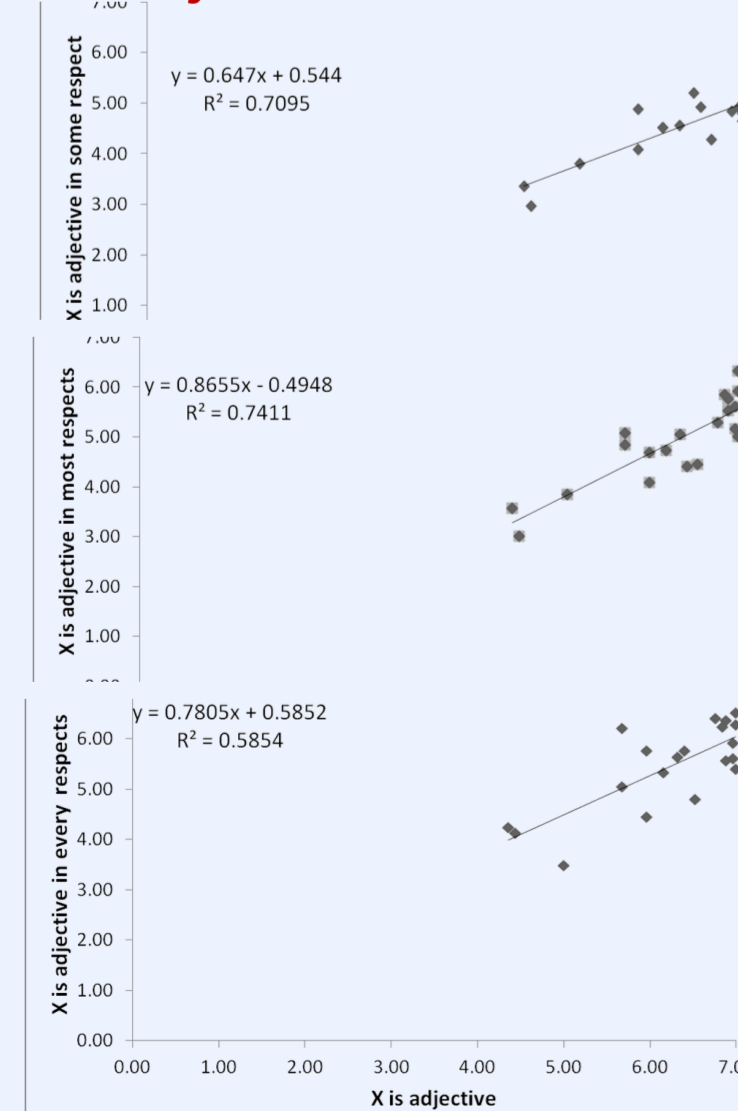
- Natural kinds: **This farm animal is a horse.**  
 This farm animal is a horse in some/ most/ every respect.  
 This farm animal is more a horse than that one/ than a cow/ than that one is a cow.
- Social categories and artifacts **This artist is a composer.**  
 This artist is a composer in some/ most/ every respect.  
 This artist is more a composer than that one/ than a conductor/ than a conductor is.
- Adjectives **This farm animal/artist is exciting.**  
 This farm animal/artist is exciting in some/ most/ every respect.  
 This farm animal/artist is more exciting than that one / than boring/ than that one is boring.

### Results 1

Basic (x is P) x Dimensional quantifiers (P in n respects):

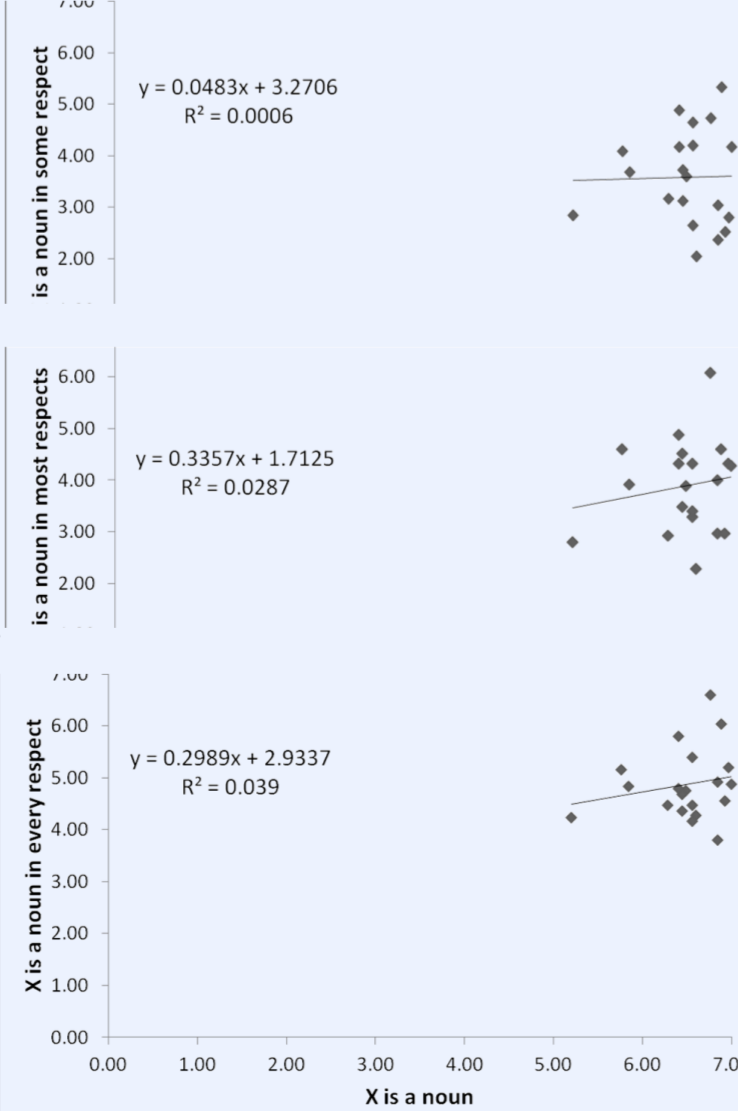
Adjectives: Yes ✓

Nouns: No ✓



**Quantificational dimension-integration**

- The basic forms are generally good.
- In adjectives the quantified forms are good as well.
- Their felicity nicely match the felicity in the basic forms.
- In nouns their scores cover almost all the range 2/4 – 6, Independently of the basic form.

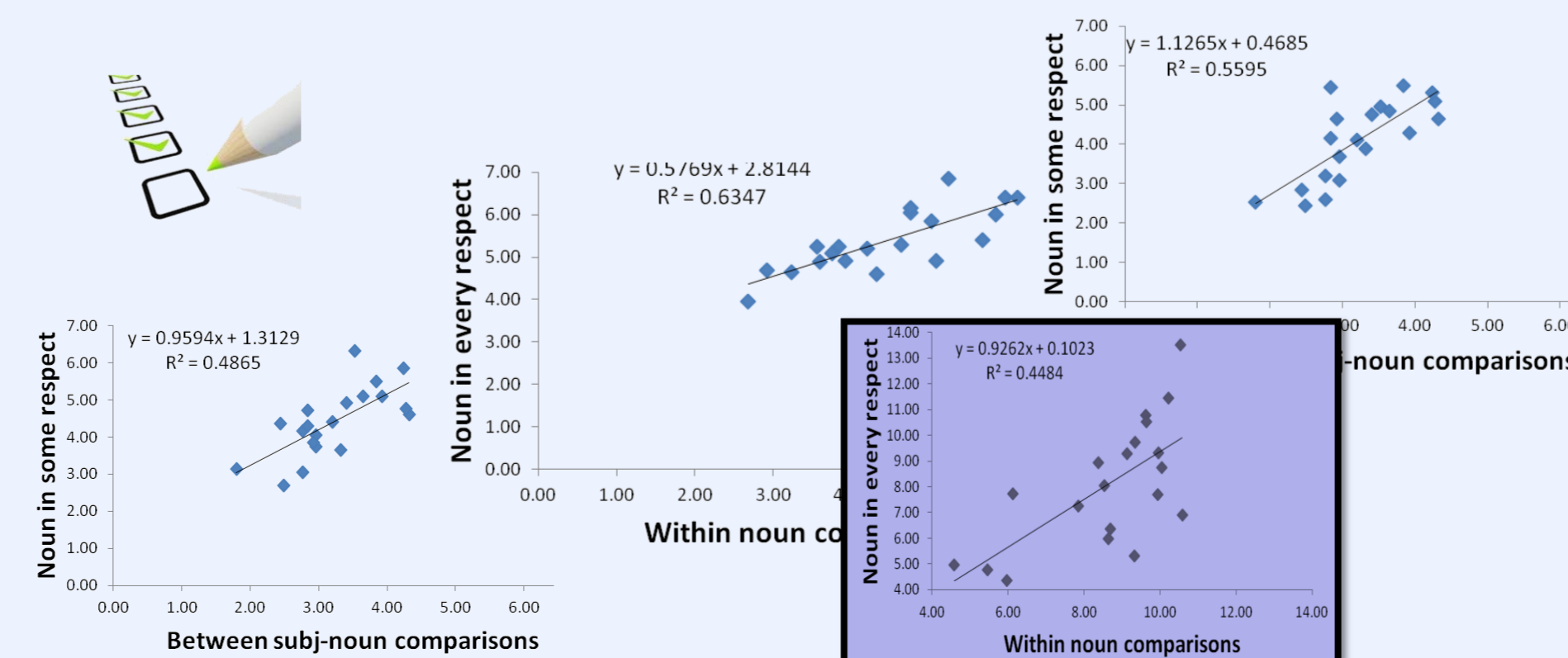


### Results 2

Comparison (more) x Dimensional quantifiers

Nouns: Yes! ✓

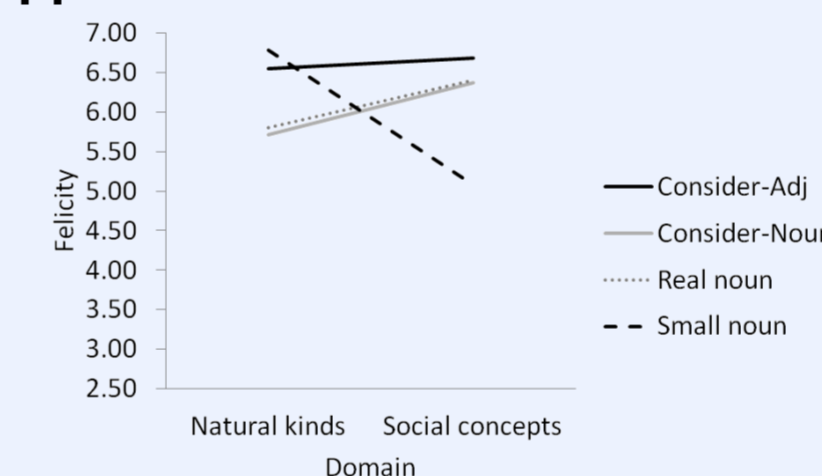
- Three examples of correlations (r is 6.5 – 9, p >> .0028, the Bonferoni corrected threshold).
- Correlations obtain even with respect to reaction time.



### Results 4

Even nominal modifiers (*real*) and evaluative ones (*consider*) exhibit the **natural < social** domain difference.

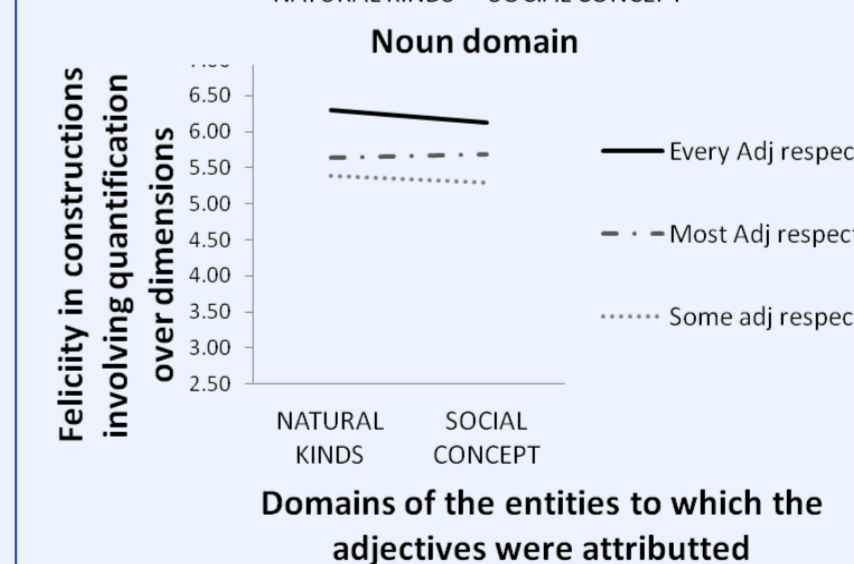
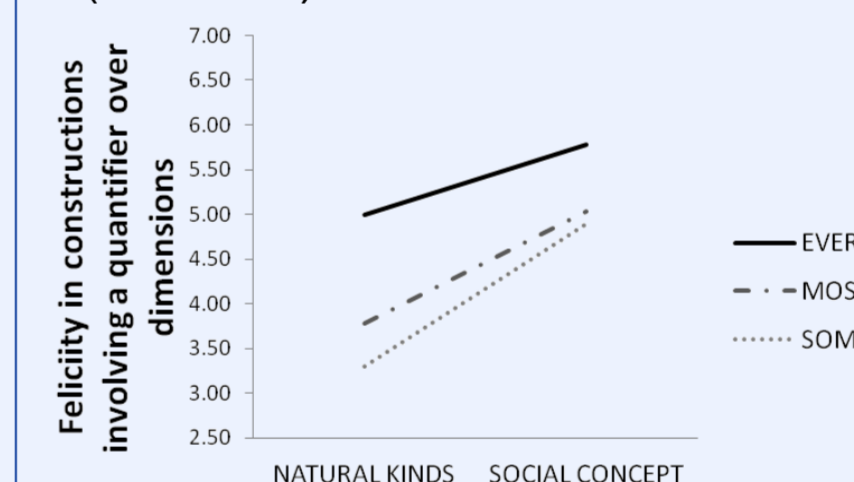
As expected, *small* exhibits an **opposite domain difference**:



### Results 3

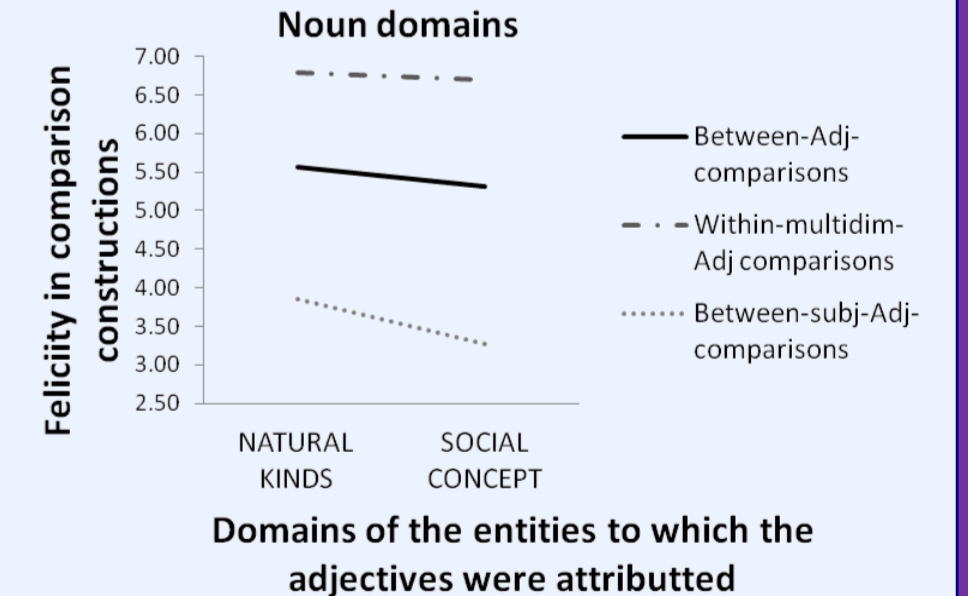
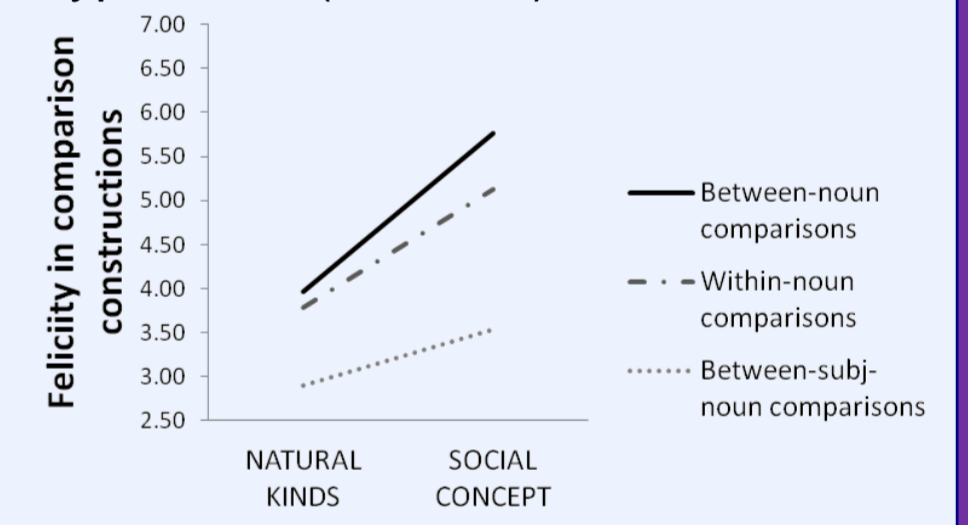
The noun dimensions are not quite accessible, those of adjectives are more accessible, but not much w.r.t. social nouns. ✓

Anova for the nouns yields sig effects of domain (P<. 0003) and quantifier force (P<.0001) and an interaction (P<.0001). Adjectives (right) only force (P<.0001): All > Most > Some



Social nouns are better than natural kind ones (right), and no worse than adj's in 2 out of 3 comparison types.

Anova for the nouns yields sig effects of domain (P<. 0005) and comparison type (P<.0001) and an interaction (P<.0001). Adjectives (right) only exhibit a comparison type effect (P<.0001).



### Consequences

- Counting dimensions (= quantification over dimension):**  
 John is Healthy ⇔  
 John is **c** healthy in **n** many (all, most, some) respects.
- Adjective-selecting morphemes involve dimension counting:**  
 -Al is healthier than Ann ⇔  
 a) Al is healthier in **n** many respects (all, most, some).  
 b) Al is **c** healthy in more respects than Ann is.