How World Knowledge Shifts Adjective Interpretation

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Dimensional Adjectives

Dimensional adjectives are interpreted relative to a contextually determined comparison class (Klein, 1980; Lassiter & Goodman, 2013)

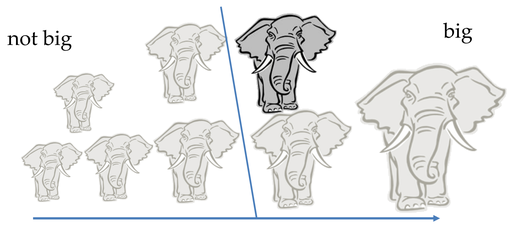


Figure 1: Comparison Class

Hypothesis

The comparison class is determined by integrating information from the immediate visual context with world knowledge. (Tribushinina, 2011)

Prototypicality

One kind of world knowledge about size of objects is prototypicality; elephants are prototypically big. This may be determined, e.g., by lexical association patterns – things typically described as *big*. (Dirven & Taylor 1988; Tribushinina 2008, 2009; Vogel 2004)

Exp. 1 – Replication

Participants: 50 English speakers on MTurk

Procedure: Participants saw displays of seven images of the same object scaled to different sizes, and heard:
(1) Which hippos are [big/small]?

Prot. big	Neutral	Prot. small
Elephant	Umbrella	Mouse
Hippo	Cake	Gnome
House	Monkey	Baby
Plane	Balloon	Chick

Stimuli & Predictions

Which hippos are big/small?
Immediate context – small zone = big zone
World knowledge – all small
Integration – small zone > big zone

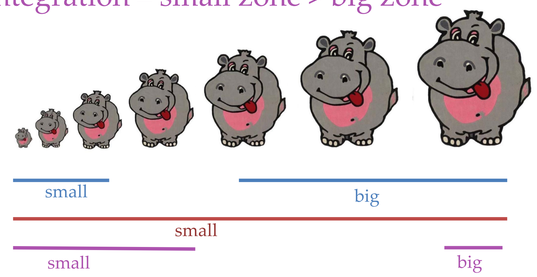


Figure 2: Sample stimulus and possible zone sizes

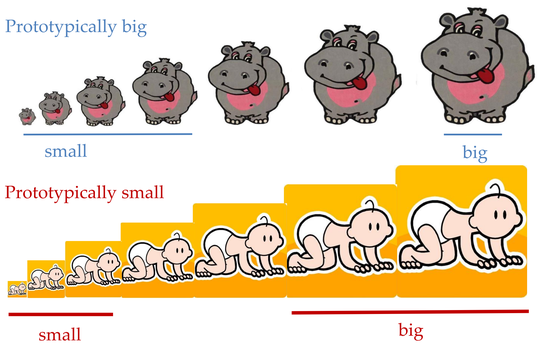


Figure 3: Prototypicality effects

Results

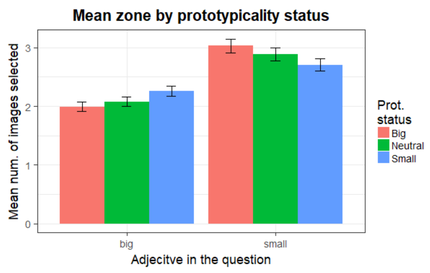


Figure 4: Exp. 1 results – mean zone size by prototypicality status

Discussion

- Successful replication
- Supports integration of world knowledge and visual context

What is world knowledge? Are real size and prototypicality status equivalent?

Exp. 2 – Photographs

Participants: 41 English speakers on MTurk
Procedure: As Exp. 1, but using photos instead of cartoons.
Predictions: As in Exp. 1

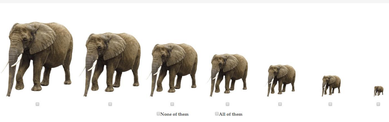


Figure 5: Exp. 2 sample stimulus

Results:

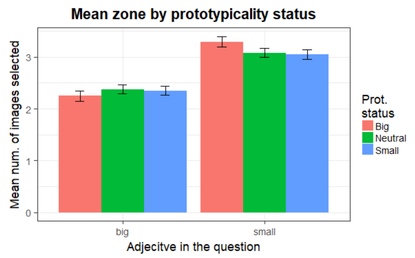


Figure 6: Exp. 2 Results

- *Big* zone (mean = 2.33, sd = 0.8) < *small* zone (mean = 3.14, sd = 0.8), as predicted (Wilcoxon SRT, $p < 0.001$)
- The prototypicality effects didn't replicate

Discussion

- Integration of size info with visual context
- Prototypicality effects change:
  - Cartoons – prototypically small and neutral objects diverge
  - Photos – prototypically small and neutral objects behave the same

Are these effects due to integration of world knowledge with the visual context (**Integration Hypothesis**) or to scale structure differences between *big* & *small* - *small* is bounded, while *big* is not (**Scale Structure Hypothesis**)?

Exp. 3 – Tiny Objects

Participants: 42 English speakers on MTurk
Procedure: As Exp. 2, but tiny objects, where the image is larger than the object depicted
Stimuli: ant, bean, blueberry, candy, earring, fly, hazelnut, ladybug, pill, pin, seed, tack

Stimuli & Predictions

Predictions:
Integration – *big* zone > *small* zone
Scale structure – *small* zone > *big* zone

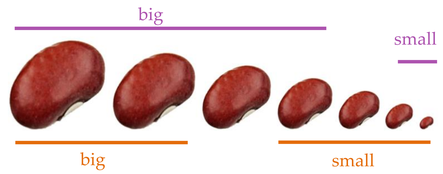


Figure 7: Exp. 3 sample stimulus and predictions

Results:

- Flipped *Big* zone (mean = 2.33, sd = 0.8) **bigger** than *small* zone (mean = 3.14, sd = 0.8), (Wilcoxon SRT, $p < 0.001$)
- Supports Integration Hypothesis

Conclusion

- Exp. 1 shows integration of prototype information and immediate visual context in dimensional adjective interpretation
- Exp. 2 indicates that when photographs are used real world size may be used instead of prototype status
- Flipped result in Exp. 3 supports integration of size info with information from the visual context

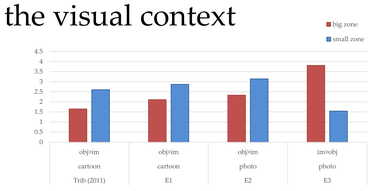


Figure 8: Zone size summary

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