9/S17109

European Commission
Framework 6 Grant
516542 (NEST)

Formation of category representations

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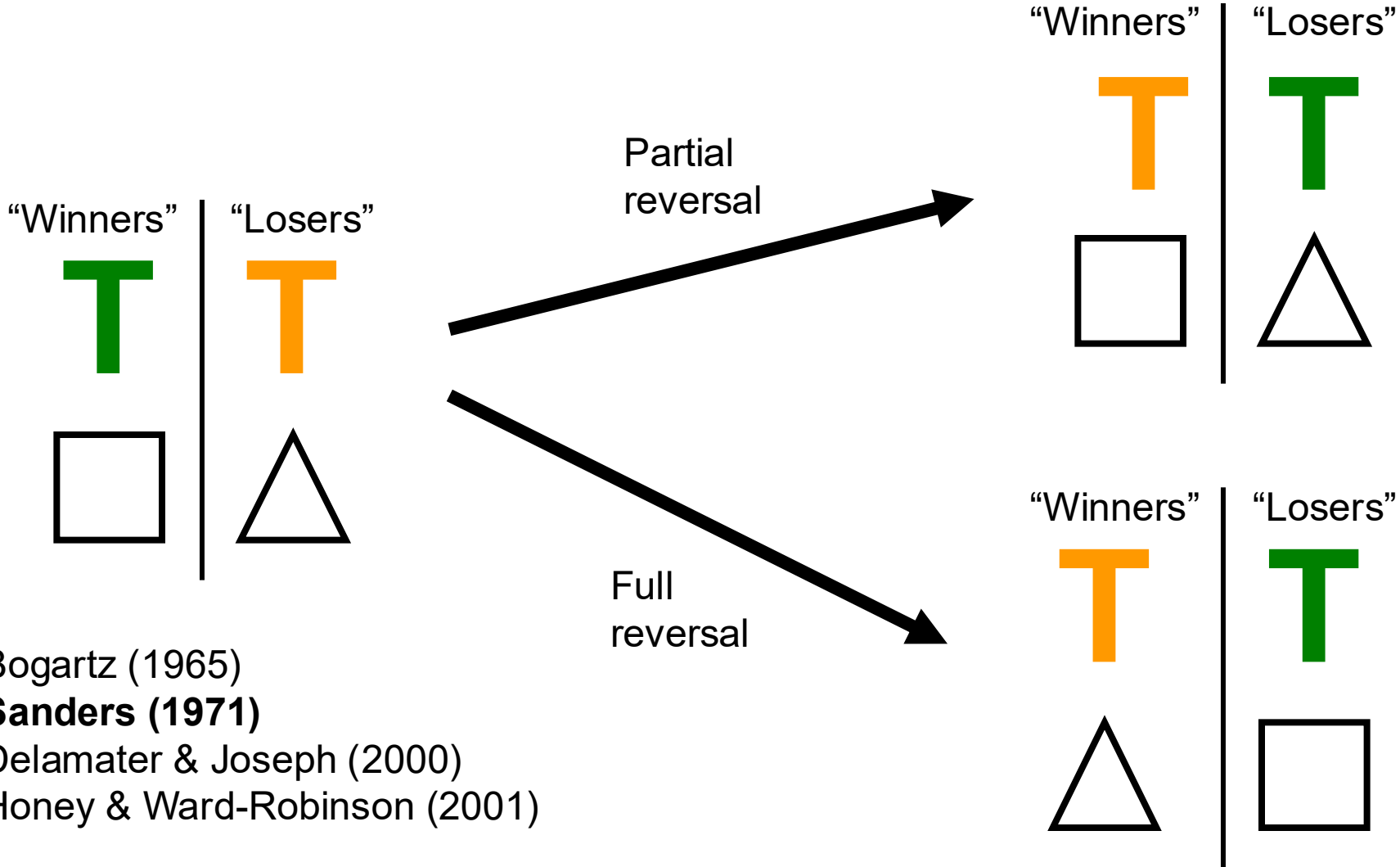
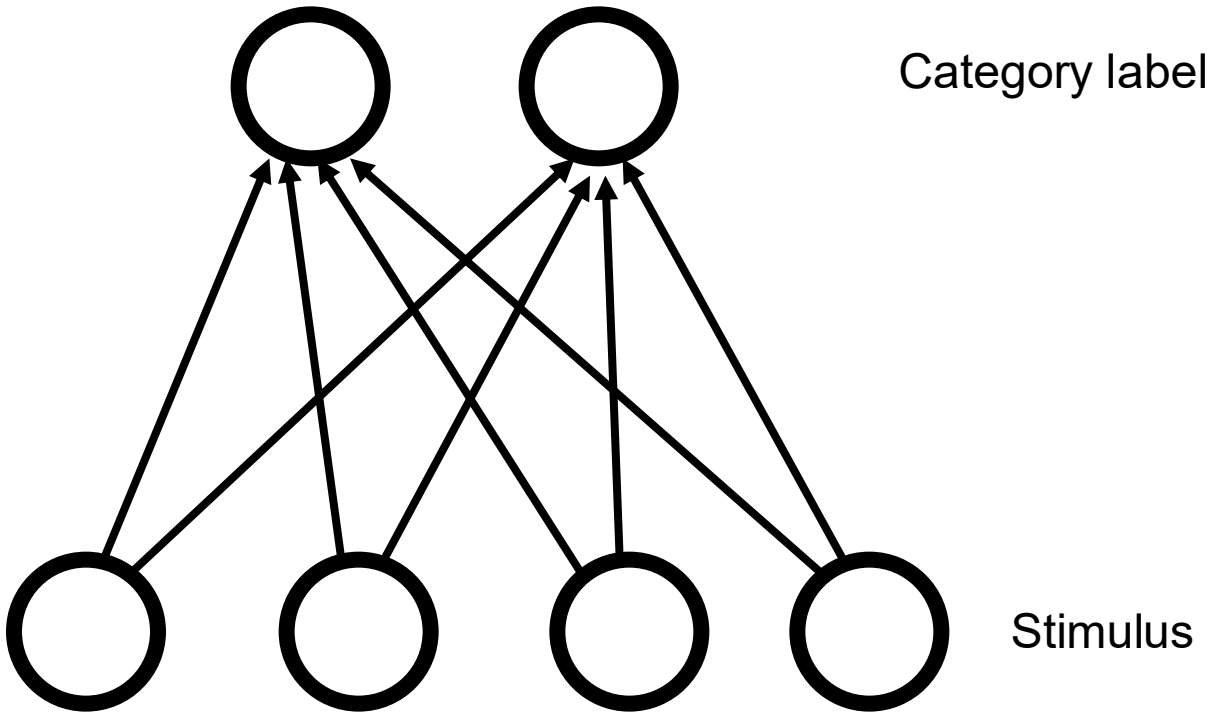
Partial vs. full reversal

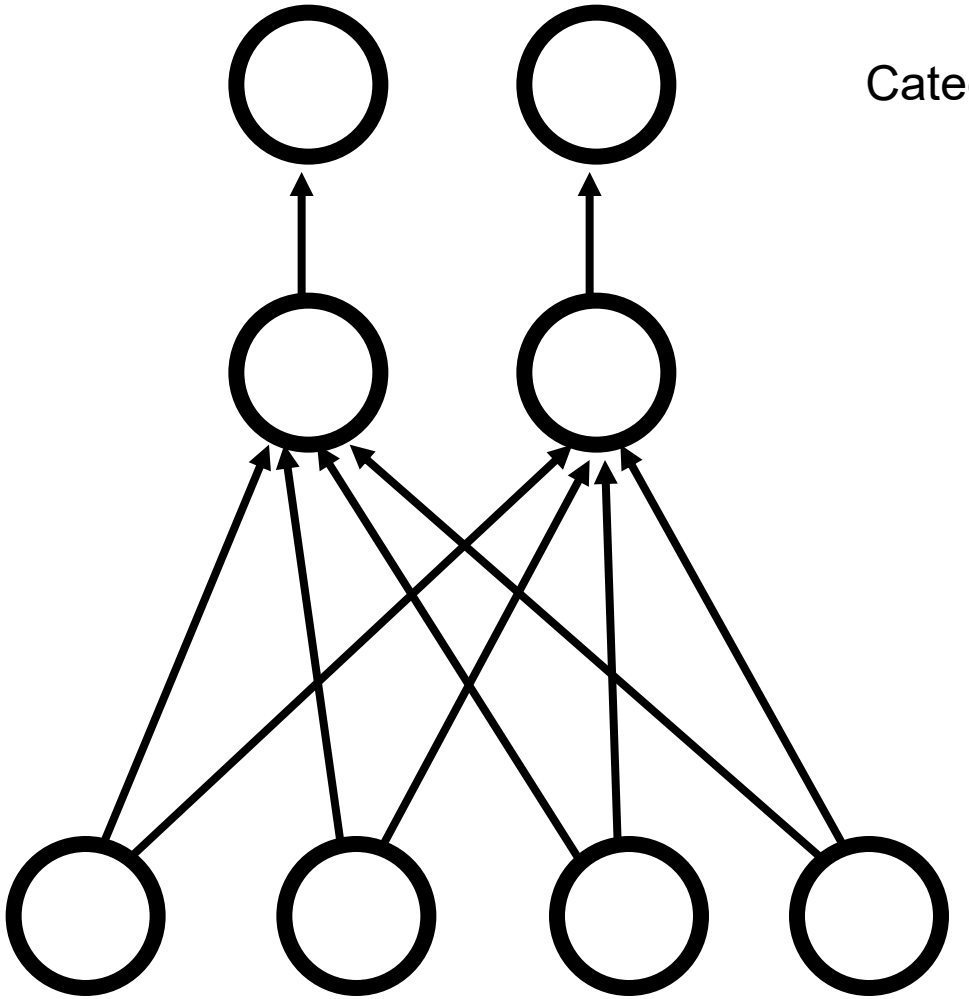


Bogartz (1965)
Sanders (1971)
Delamater & Joseph (2000)
Honey & Ward-Robinson (2001)

Formal models of categorization in humans



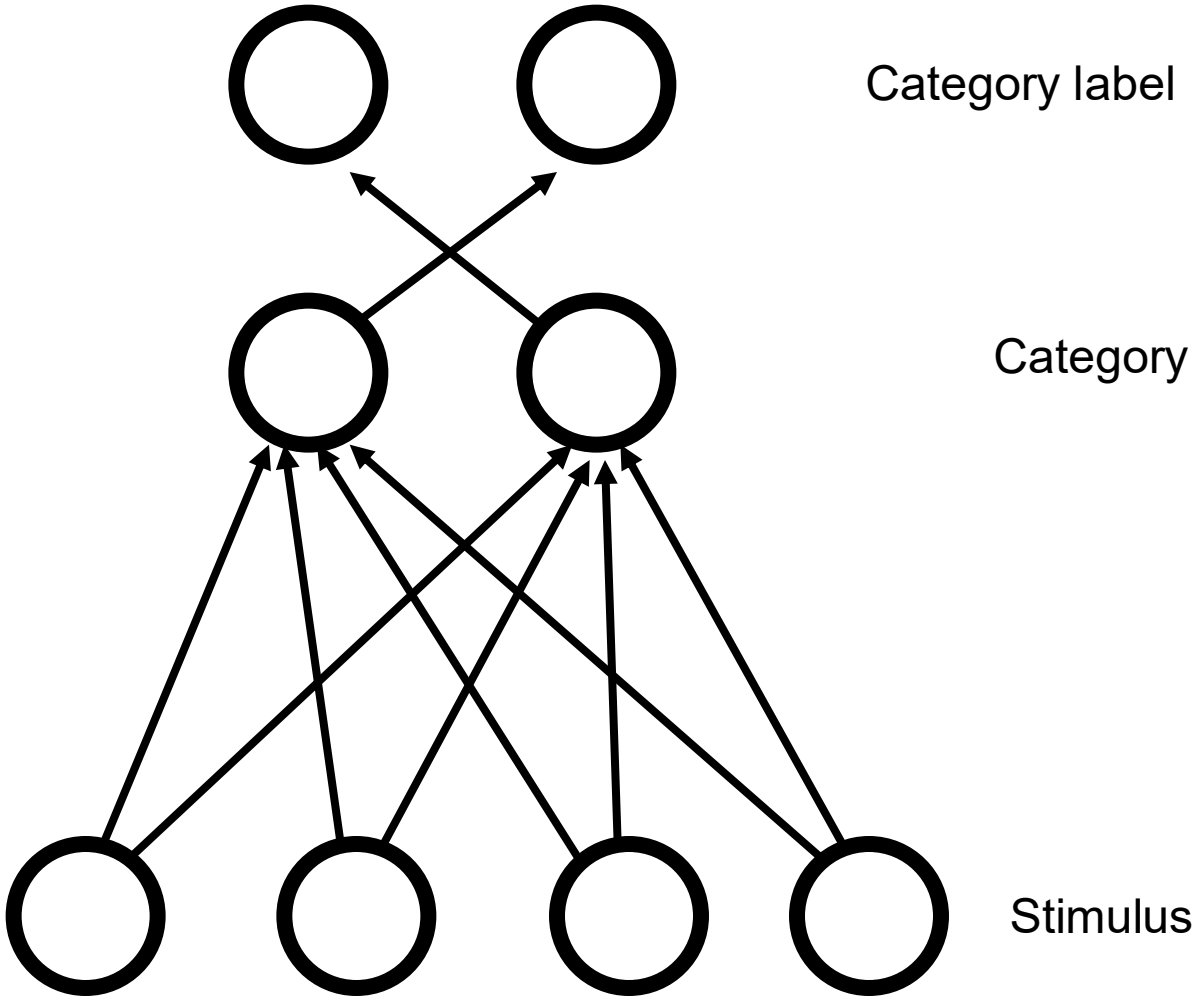
Category representations



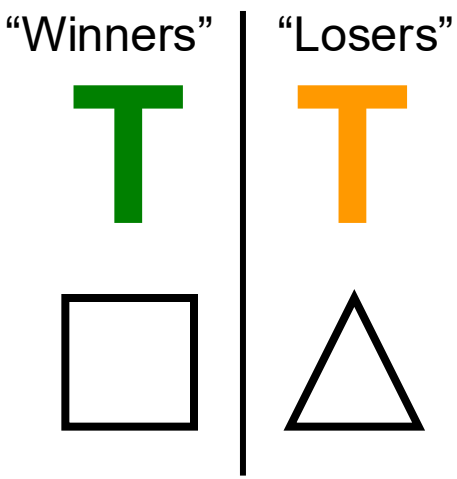
Kruschke (1996)

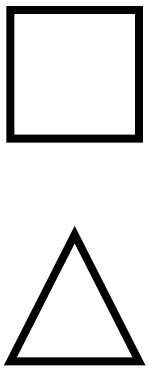
Honey (2000)

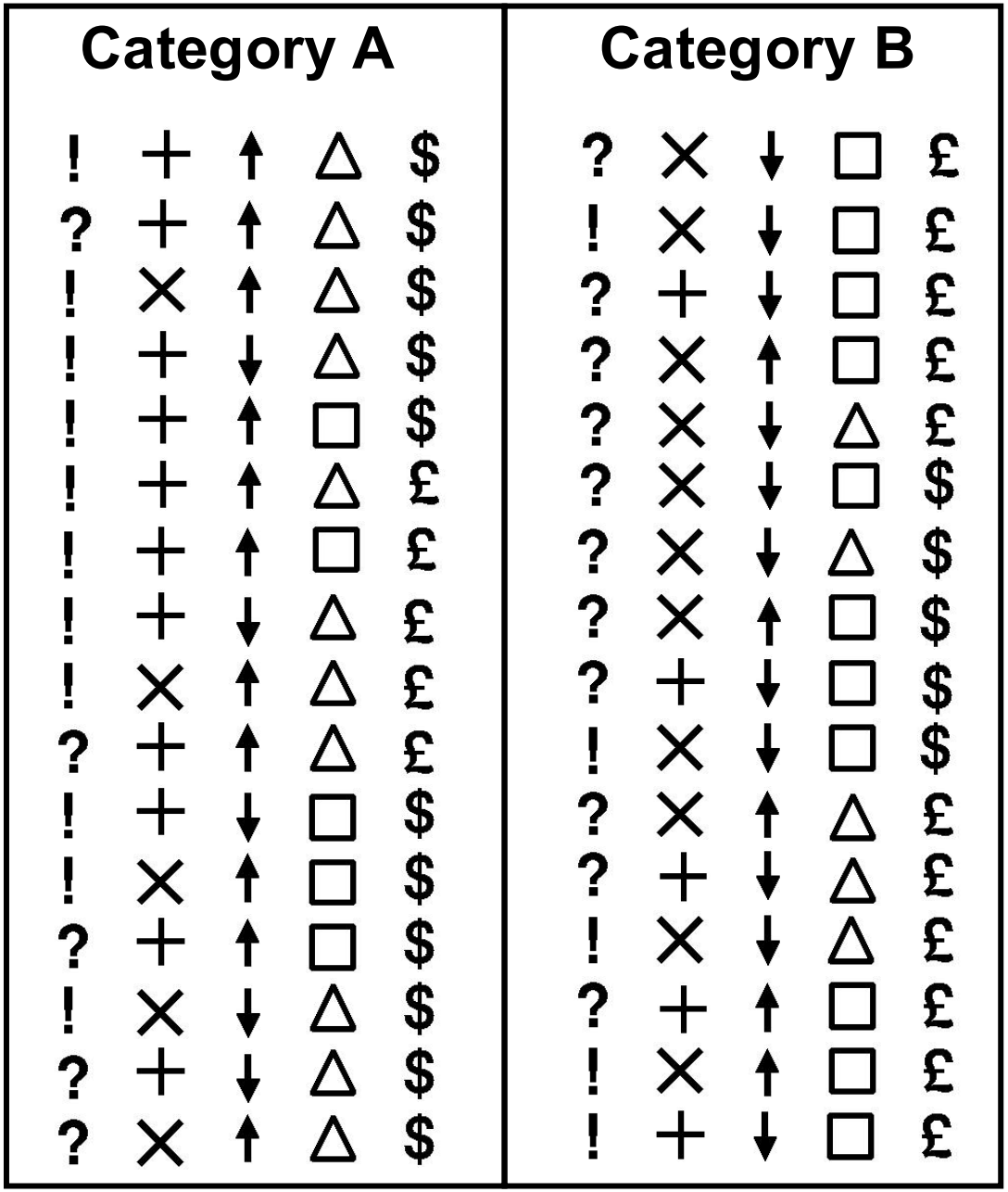
Category representations



Non-attentional optional shift







Polymorphous concepts

No feature is necessary or sufficient

Coherent categories
(maximizes within-category similarity and minimizes between-category similarity)

Feature-pairs stochastically independent

Category A	Category B	Reversal
! + ↑ △ $	? × ↓ □ £	
? + ↑ △ $	! × ↓ □ £	
! × ↑ △ $	? + ↓ □ £	
! + ↓ △ $	? × ↑ □ £	
! + ↑ □ $	? × ↓ △ £	
! + ↑ △ £	? × ↓ □ $	
! + ↑ □ £	? × ↓ △ $	✓
! + ↓ △ £	? × ↑ □ $	✓
! × ↑ △ £	? + ↓ □ $	✓
? + ↑ △ £	! × ↓ □ $	
! + ↓ □ $	? × ↑ △ £	✓
! × ↑ □ $	? + ↓ △ £	✓
? + ↑ □ $	! × ↓ △ £	
! × ↓ △ $	? + ↑ □ £	✓
? + ↓ △ $	! × ↑ □ £	
? × ↑ △ $	! + ↓ □ £	

%age of reversed responses in test phase

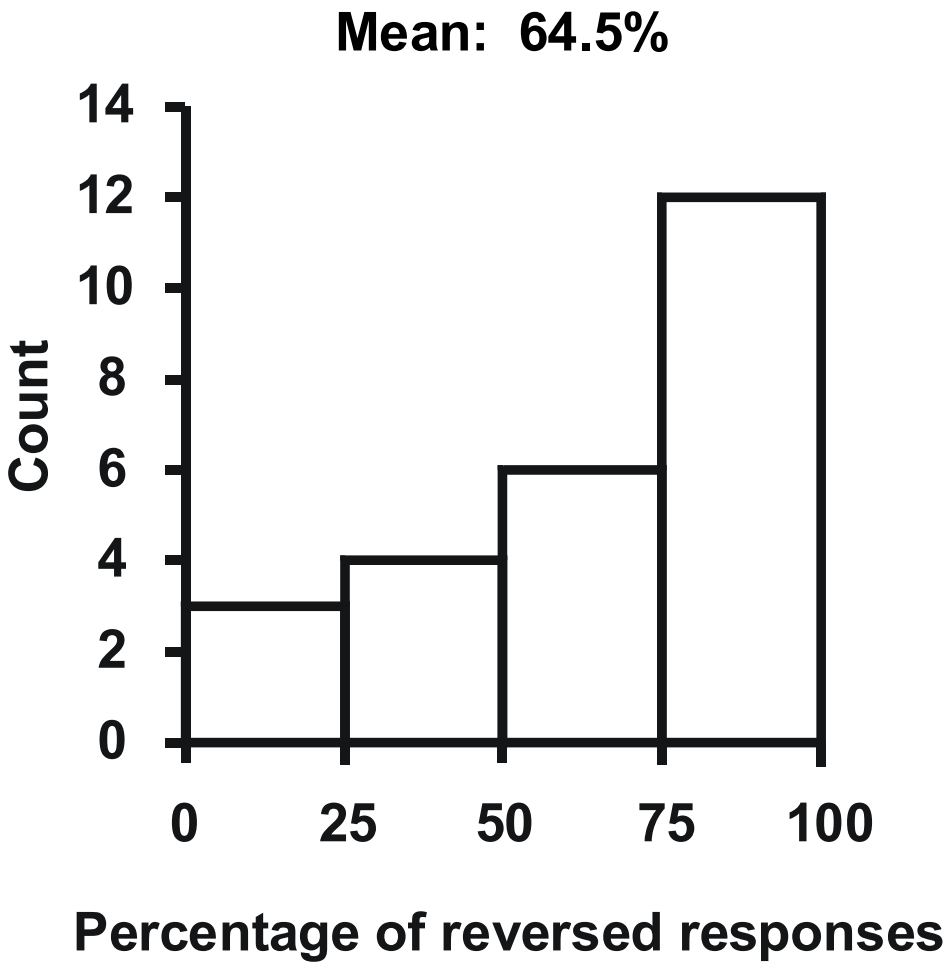
Without category representations

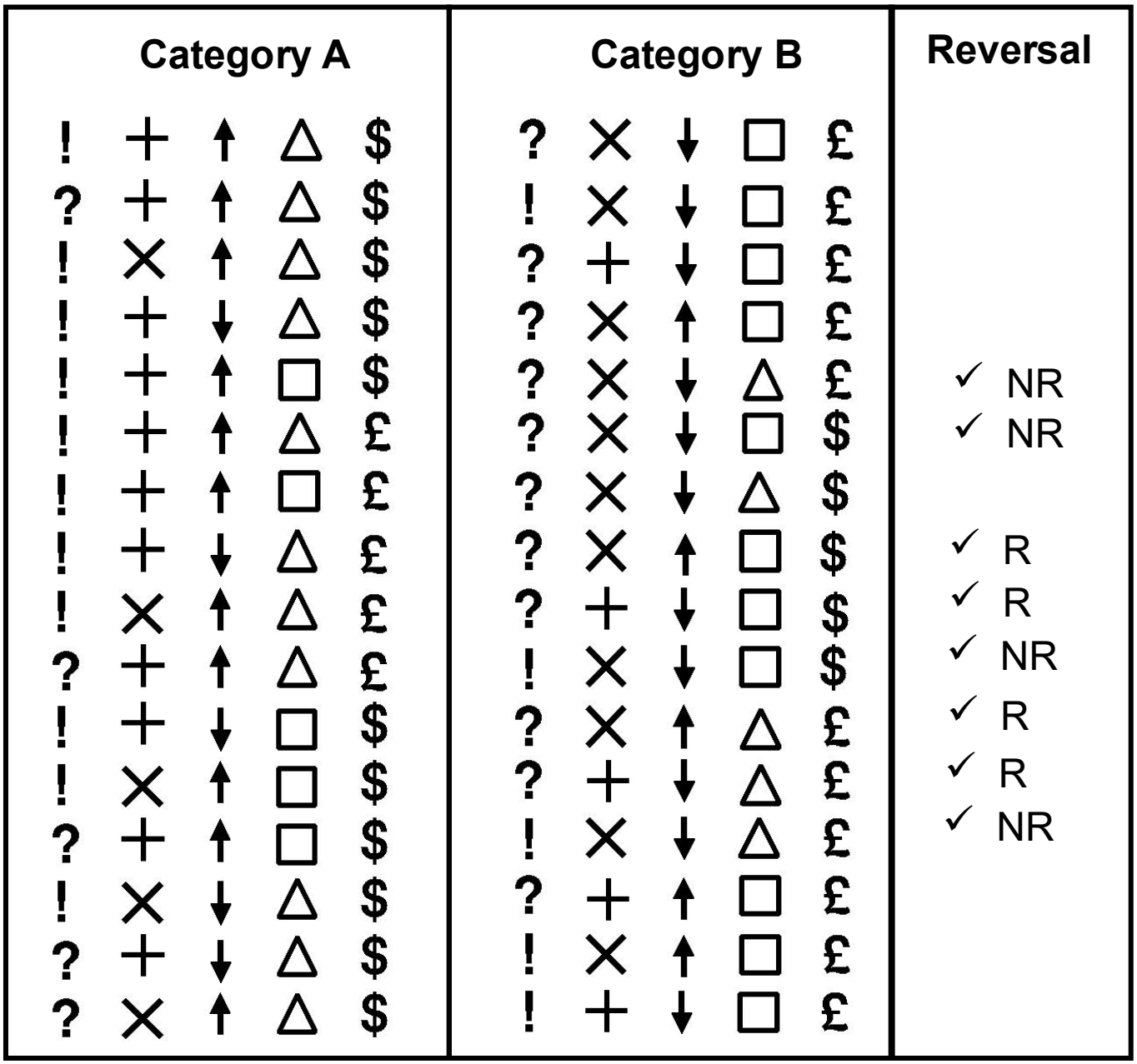
0% (Ignore phase 1)

50%(Ignore phase 2)

With category representations

Up to 100%


Mean: 64.5%
Count
14
12
10
8
6
4
2
0
0
25
50
75
100
Percentage of reversed responses



%age of reversed responses in test phase

Category reps

Up to 50% (ignore both phases)

Up to 25% (ignore phase 1)

Down to 0% (ignore phase 2)

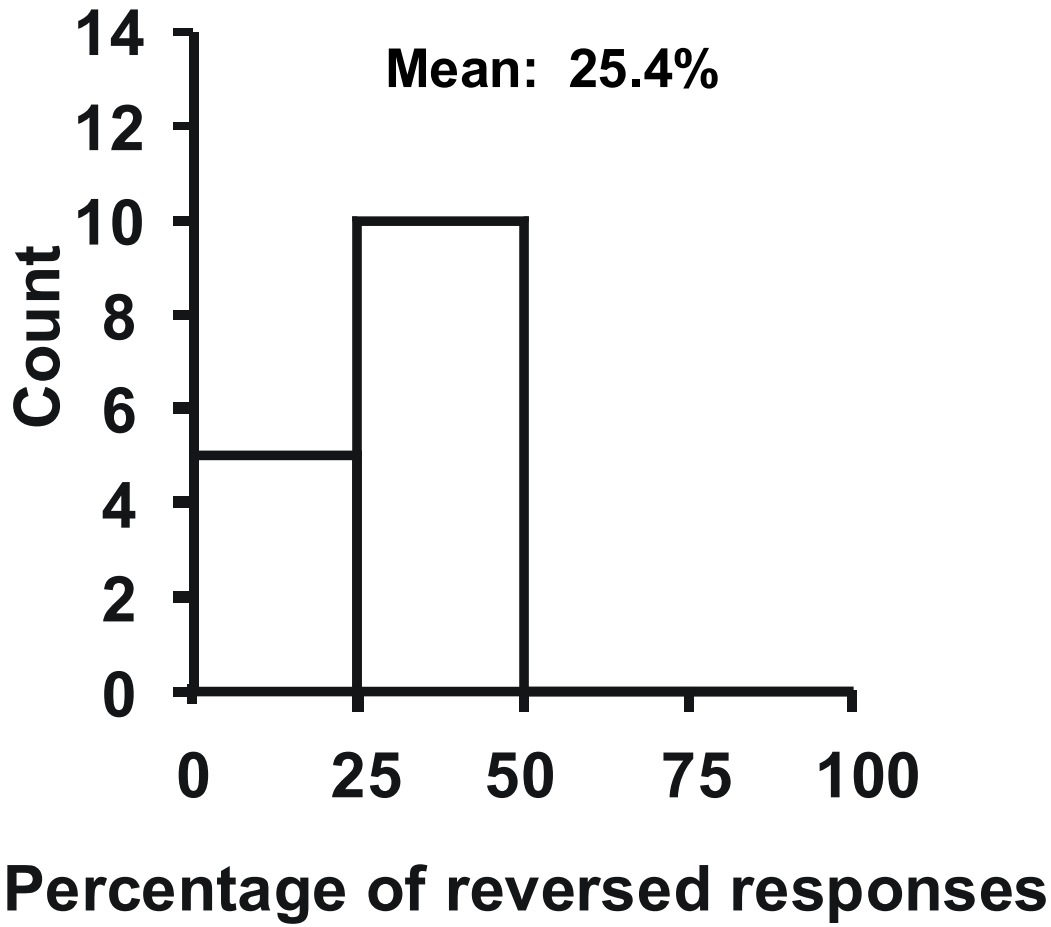
Feature-level

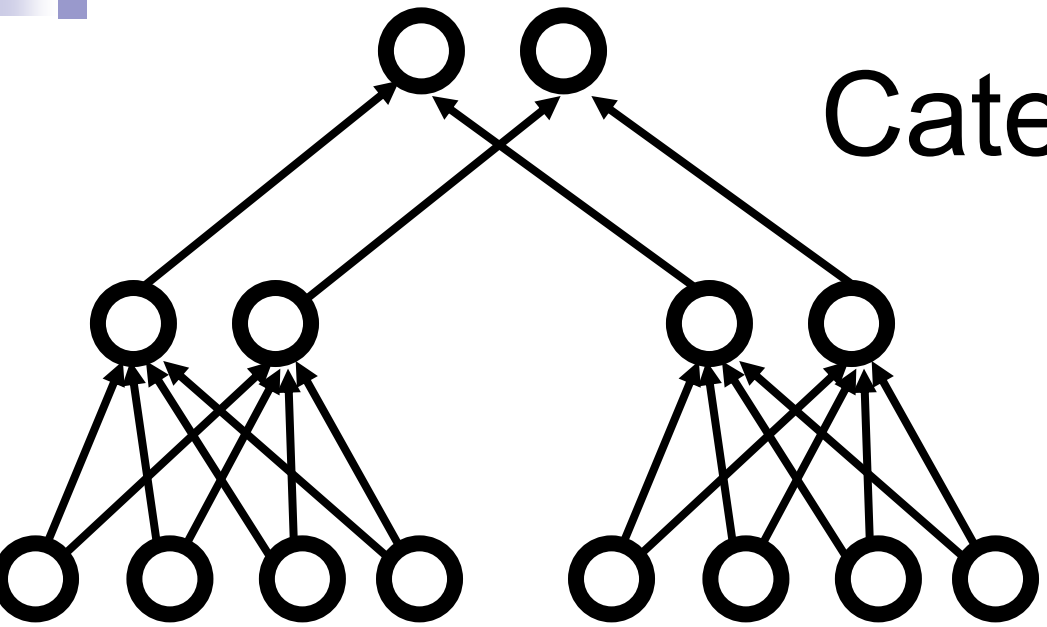
Up to 75% (reversal generalizes perfectly to non-diagnostic feature-pairs)

Neither

50% or less (similarity)

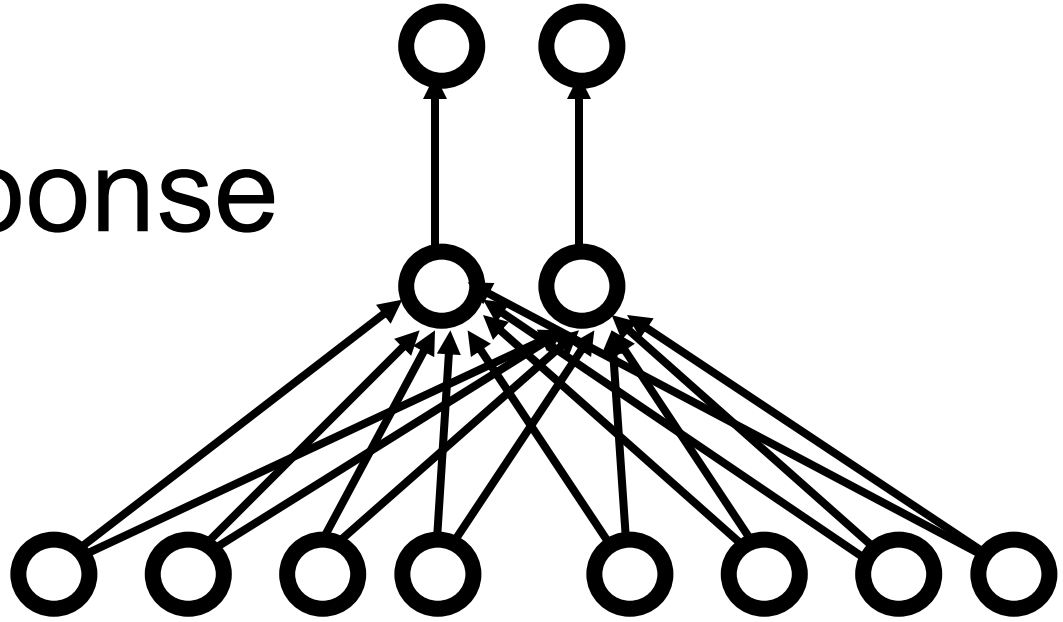
Both 0-75%

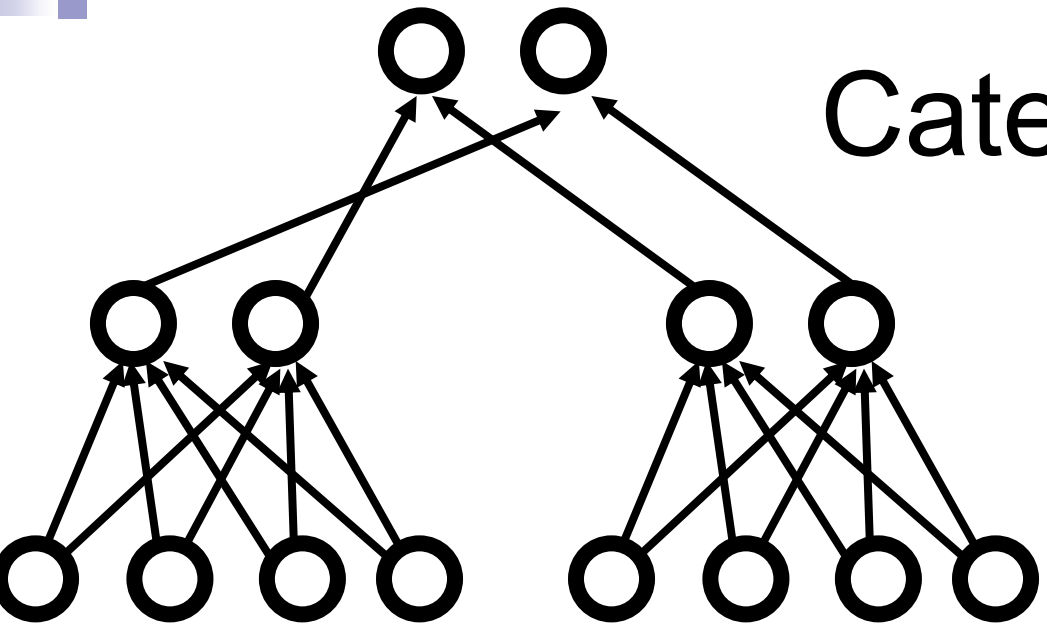

Mean: 25.4%
Count
14
12
10
8
6
4
2
0
0
25
50
75
100
Percentage of reversed responses



Categories

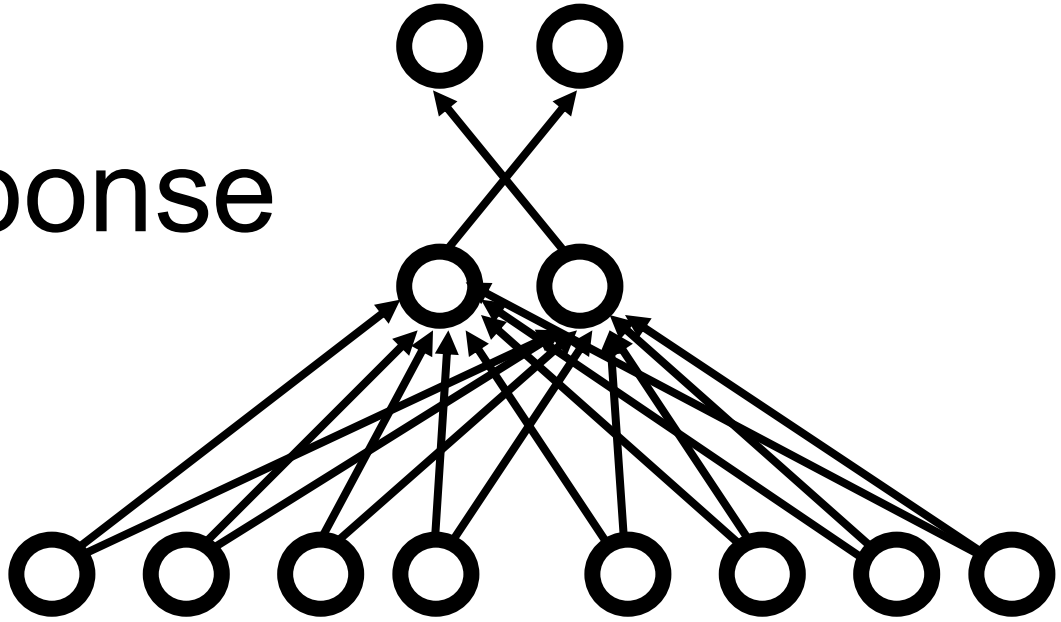
Response sets



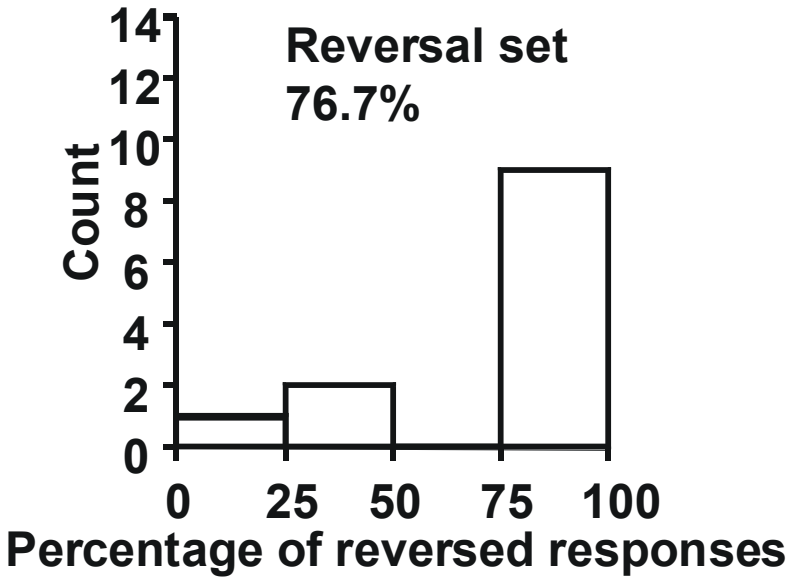


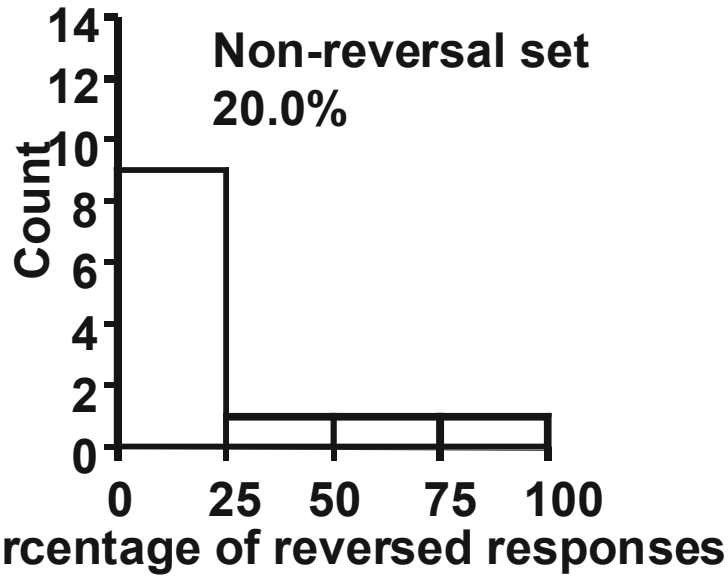
Categories

Response sets



Category A	Category B
@ ♠ Ω ||| ↺	# ♥ α ≡ ↻
! + ↑ △ $	? × ↓ □ £





Summary

- These data are consistent with the idea that each distinct class of objects we have encountered evokes a distinct category representation that is dissociable from the category label it is given

- “a rose by any other name,” rather than “a rose is a rose.”