

## ABSTRACT

Symmetry is a property that plays a role in many domains of human cognition and in nature. Notions of symmetry play an important role in logic and geometry, and in the syntax and semantics of natural languages. The familiar logical definition of symmetry as a property of binary relations is given in (1).

(1) A relation  $R$  is *symmetrical* iff for all  $x, y$ : if  $R(x,y)$ , then  $R(y,x)$ .

In English (not only), there is a kind of two-part litmus test for the symmetricals: If they surface in intransitive structures such as (2a), then (i) the sentential subject has to be plural (compare (2b)) and (ii) the reading, or interpretation, is roughly reciprocal.

(2) The Litmus Test (Gleitman et al 1996)

- a. John and Bill are similar/match/hug. (Plural subject, roughly reciprocal)
- b. \* John is similar/matches/hugs. (Singular subject infelicitous)

Here we want to look at real and apparent mismatches among (a) the logical definition, (b) the linguistic litmus test, and (c) judgments offered by native speakers. Our goal is to diagnose the mismatches, and in trying to explain them, to get a better handle on the interplay of lexical meaning, syntactic structure, context, and the pragmatic effects of a speaker's choosing to use one syntactic structure rather than another.

One big problem came from Amos Tversky, who argued in a 1977 paper that *similar* is not symmetrical, on the grounds of a significant difference in subjects' degrees of agreement with the following two statements:

- (3) a. North Korea is similar to Red China.  
b. Red China is similar to North Korea.

Gleitman et al (1996) showed how the judgments about (3a-b) arise from a symmetrical lexical item *similar* being put into an asymmetrical syntactic structure.

Extending that work and other work since then, we first argue for classing predicates (verbs, nouns, adjectives, prepositions) by a combination of logical and linguistic criteria. The "pure symmetricals" are those that are symmetrical by the tests of both (1) and (2): *similar, match, cousin*. An interesting class, the "mixed symmetricals", behave linguistically like symmetricals by the litmus test of (2), but logically have both symmetrical and asymmetrical "instances": *love, hug, friend*. And by synthesizing logical and linguistic perspectives, and identifying both lexical and syntactic contributions to inferences about the status of the two 'participants' in a binary relation, we may contribute to a possible resolution of a range of further puzzles about symmetrical predicates.

We close with a brief look at some striking findings about symmetrical predicates in an emerging sign language, Nicaraguan Sign Language (Gleitman et al 2019).