

# Linear implicature and free choice permission

Chris Barker, New York University

In classical logic, given some proposition  $A$ , along with the proposition that  $A$  implies  $B$ , it is valid to conclude the conjunction of  $A$  and  $B$  (via contraction and modus ponens). Not so in a resource-sensitive logic such as Girard's Linear Logic: if  $A$  is the proposition that you have a piece of cake, and  $A$  implies  $B$  is the proposition that eating cake implies happiness, then the conjunction of  $A$  and  $B$  describes the state of having your cake and eating it too. In Linear Logic, using a piece of cake to prove happiness requires consuming the cake (contraction is not generally available). As Wadler puts it, if classical logic is the logic of truth, then Linear Logic is the logic of food.

When we use natural language to express thoughts about food and other resource-sensitive domains, Linear Logic may provide a better way of describing what is meant by an utterance than classical logic. The free choice permission problem provides a test case. In Kamp's 1973 version, the puzzle is how a disjunction can come to be paraphrased by a conjunction, e.g., how "You may have an apple or a pear" can mean "You may have an apple and you may have a pear". Surely it is not a coincidence that examples that illustrate free choice permission are often about food!

The dominant solutions to the permission free choice problem give disjunction a dramatically different kind of interpretation than conjunction. The Linear Logic perspective provides a way to restore the intuitive duality of "and" and "or".