

Reasoning for Humans: Clear Thinking in an Uncertain World

PHIL 171

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Measuring Arguments

There are three ways to *evaluate* an object o in terms of its length:

Qualitative: The object o is *long*

Quantitative: The length of the object o is 1 meter

Comparative: Object o is *longer* than object o'

How do we *measure* the strength of an argument?

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1. φ evidentially supports ψ
2. φ is positively relevant to ψ .

$Pr(\psi | \varphi)$ measures the evidential support of the argument.

But, how do we measure the relevance of φ to ψ ?

There are many *confirmation measures*. Here are two:

1. Difference: $d(\varphi, \psi) = Pr(\psi | \varphi) - Pr(\psi)$

2. Likelihoods ratio: $\ell(\varphi, \psi) = \frac{Pr(\varphi|\psi) - Pr(\varphi|\neg\psi)}{Pr(\varphi|\psi) + Pr(\varphi|\neg\psi)}$

	P	Q
0.2	T	T
0.3	T	F
0.3	F	T
0.2	F	F

$$d(P, Q) = Pr(Q | P) - Pr(Q) = -0.1$$

$$\ell(P, Q) = \frac{Pr(P | Q) - Pr(P | \neg Q)}{Pr(P | Q) + Pr(P | \neg Q)} = -0.2$$