

# Relational Syllogisms with Numerical Quantifiers and Beyond

Ka-fat CHOW

The Hong Kong Polytechnic University, Hong Kong  
kfzhou@yahoo.com

This page provides the hyperlinks to and some basic information about the article “Relational Syllogisms with Numerical Quantifiers and Beyond” in the *Journal of Logic, Language and Information*, published online: 2021.

**Hyperlinks to the paper:** (i) full-text view-only version of the paper, (ii) author’s accepted manuscript of the paper, (iii) DOI of the paper

**Homepage:** My homepage

**Abstract:** In the first half of this paper, we present a fragment of relational syllogisms named RELSYLL consisting of quantified statements with a special set of numerical quantifiers, and introduce a number of concepts that are useful for the later sections, including indirect reduction, quantifier transformations and equivalence of syllogisms. After determining the valid and invalid syllogisms in RELSYLL, we then introduce two Derivation Methods which can be used to derive valid relational syllogisms based on known valid simple syllogisms. We also show that the two Methods are sound and complete for RELSYLL. In the second half of this paper, we discuss ways to extend the Derivation Methods, including the use of more valid syllogisms and the use of existential assumptions. In this way, we are able to derive more relational syllogisms that contain other types of non-classical quantifiers, including “only” and proportional quantifiers. Finally, we state and prove a proposition concerning the relationship between the two Methods.

**Keywords:** relational syllogisms; simple syllogisms; numerical quantifiers; proportional quantifiers; existential assumptions