Transactional Logic

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0.0 Introduction

I talked about my original idea called *propositional stability*- roughly, when a truth-value for a proposition or sentence remains bound by the same range of truth-values after being *transacted* between two logics regardless of the range of truth-values available within the second logic.

So, no proposition or sentence assigned *true* or *false* under a classical logic can be assigned say *both true and false* within say a Kleene 3-valued so-called *logic of contradiction*(Priest's *logic of paradox* where a third-truth value is understood as standing for *both true and false* rather than as *indeterminate* which was proposed as a solution to Alethic paradox).

I'd like to take some time to elaborate that concept, discuss two related concepts, and then talk briefly about combined modal logics which have just begun to be studied.

Again, importantly, a lot of this discussion fits within the larger logical pluralism debate which regards the feasibility of at least one of the following three theses:

(1) There is no one, sole and universal, logic that structures, limits, defines, or describes all of reality.
(2) There are either multiple truth-predicates/operators, conceptions of truth, and/or alethic inferences underpinning truth-predicates/operators.
(3) There are multiple truth-properties.

That thesis is not as radical as it might at first seem -*abductive* reasoning is common in law, medicine, and science and requires something like a non-monotonic logical framework to truly represent and understand the types of valid inference patterns allowed. Classical logic (Boolean Algebra), however, is *monotonic*.

1.0 Definitions

Meta-language: (following Tarski) a language *L* sufficient for First-Order Logic within which object languages are constructed.

Object-language: a language *O* constructed within a meta-language *L* - the target language to

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be specified or built.

Cross Logics: two object languages O_1 *and* O_2 so-constructed in a meta-language *L* such that they comprise a *transactional logic* are each referred to as the *cross logic* of the other.

Logical Transaction: a time-based mechanism or procedure by which a proposition *P* in a meta-language *L* also residing in an object language *O* in *L* is assigned a new truth-value within the *cross logic* of *L*.

Transactional Logic: a meta-language L implements a *transactional logic if-and-only-if* L contains languages O_1, ... that are *cross logics* of each other supporting *logical transactions* between them.