Eliminating Undecidability and Incompleteness in Formal Systems

To eliminate incompleteness, undecidability and inconsistency from formal systems we only need to convert the formal proofs to theorem consequences of symbolic logic to conform to the sound deductive inference model.

Within the sound deductive inference model there is a *(connected sequence of valid deductions from true premises to a true conclusion)* unlike the formal proofs of symbolic logic provability cannot diverge from truth.

When we consider sound deductive inference to the negation of a conclusion we now also have a definitive specification of falsity.

Within the sound deductive inference model we can be certain that valid inference from true premises derives a true conclusion.

∴ Within the sound deductive inference model any logic sentence that does not evaluate to True or False is unsound, there is no undecidability or incompleteness in this model.

The key criterion measure that the sound deductive inference model would add to the formal proofs to theorem consequences of symbolic logic would be the semantic notion of soundness.

Formalizing the Sound Deductive Inference Model in Symbolic Logic

Axiom(0) Stipulates this definition of Axiom:
Expressions of language defined to have the semantic value of Boolean True.

Stipulating this specification of True and False:
Axiom(1) $\forall F \in Formal\_System\ \forall x \in Closed\_WFF(F)\ (True(F, x) \leftrightarrow (F \vdash x))$
Axiom(2) $\forall F \in Formal\_System\ \forall x \in Closed\_WFF(F)\ (False(F, x) \leftrightarrow (F \vdash \neg x))$

Stipulating that formal systems are Boolean:
Axiom(3) $\forall F \in Formal\_System\ \forall x \in Closed\_WFF(F)\ (True(F,x) \lor False(F,x))$

Axiom(0) provides the symbolic logic equivalent of true premises. Axiom(1) and Axiom(2) stipulate that consequences are provable from axioms. Axiom(3) screens out unsound (semantically malformed) sentences as not belonging to the formal system.

Applying the Formalized Sound Deductive Inference Model

The third step of the Tarski Undefinability Theorem proof:
(3) $x \notin Pr$ if and only if $x \in Tr$
is refuted on the basis of contradicting simplified Axiom(1): **$x \in Tr \leftrightarrow x \in Pr$**

The following logic sentence is refuted on the basis of Axiom(3)
∃F ∈ Formal_System ∃x ∈ Closed_WFF(F) (G ↔ ((F ⊬ G) ∧ (F ⊬ ¬G)))
There is no sentence G of Formal System F that is neither True nor False in F.

Making the following paragraph false:
The first incompleteness theorem states that in any consistent formal system F within which a certain amount of arithmetic can be carried out, there are statements of the language of F which can neither be proved nor disproved in F. (Raatikainen 2018)

Raatikainen, Panu, "Gödel's Incompleteness Theorems", The Stanford Encyclopedia of Philosophy (Fall 2018 Edition), Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/fall2018/entries/goedel-incompleteness/.

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