Theory Construction and Formalization

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'Formalization' Defined

The construction of a theory so that its terms, relations, and (provided the theory is interpreted) interpretations are made explicit is called formalization. An example would be a construction of a theory as a deductive theory.

Degree of Formalization

The degree of formalization varies from only making explicit one term or one relation or (provided the theory is interpreted) one interpretation to making explicit all terms and relations and (provided the theory is interpreted) interpretations. That is to say, formalization can be partial or complete.

Approaches Resulting in Partial Formalization

1. Introduction of Terms not Indigenous to Theory

A term, t, which occurs in a theory, s, is not indigenous to s if it is not the case that:

(a) t is a primitive of s or is introduced in s by means of the primitives of s; and

(b) there is no other theory s' such that the condition described in (a) is met for t in s'.

Non-indigenous terms may be introduced into a theory when segments of subject matter of a field or discipline other than that in which the theory is being constructed are presupposed. For example, in constructing a descriptive theory of human

behavior one usually presupposes terms from logic, physics, and biology. Another example would be the presupposition of prescriptive theory and descriptive theory in a design theory of human behavior.

2. Suppression of Terms Indigenous to Theory

Terms indigenous to a theory may be suppressed when segments of the theory are implicitly assumed. Such implicit assumption in empirical theory construction usually is due to the following techniques of concept formation:

(a) introduction of concepts through recursion, e.g. explicit definition,

(b) introduction of concepts through specification of sufficient conditions,

(c) introduction of concepts through specification of necessary conditions, and

(d) introduction of concepts through specification of correlated conditions.

Advantages of Formalization

To the extent that other theory is presupposed in constructing theory and that portions of the theory being constructed are left implicit, the theory cannot be examined and hence evaluated.

Disadvantages of Formalization

To the extent that the demands of formalization cannot be met with respect to constructing a theory about a given domain of phenomena, the inquiry into this domain is constricted.

A Paradoxical Conclusion

Formalize as much and as little as possible, so that your theorizing can be evaluated and so that your inquiry is not constricted.