

A MODAL TRUTH-TABULAR INTERPRETATION FOR NECESSARY AND SUFFICIENT CONDITIONS

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An event, D , is a necessary condition for an event, B , if and only if it is *never* the case that B occurs and D does not occur.¹ On the other hand, D is a sufficient condition for B if and only if it is *never* the case that D occurs and B does not occur. These familiar definitions lend themselves readily to truth-tabular schematization. In the tables below we can interpret 'P' to mean that the event is present or did occur. The 'A' is then read 'is absent'. The formulae ' $(D \textcircled{N} B)$ ', ' $(D \textcircled{S} B)$ ', and ' $(D \textcircled{NS} B)$ ' are to be read "Event D is a necessary condition for event B ", "Event D is a sufficient condition for event B ", and "Event D is a necessary and sufficient condition for event B " respectively.

D	B	$(D \textcircled{N} B)$	$(D \textcircled{S} B)$	$(D \textcircled{NS} B)$
P	P	T	T	T
P	A	T	F	F
A	P	F	T	F
A	A	T	T	T

The striking similarity that the table for ' $(D \textcircled{S} B)$ ' bears to the ordinary truth table for the horseshoe, and the similarity that the table for ' $(D \textcircled{NS} B)$ ' bears to that of the triple bar lead one to suspect that certain normal truth-functional procedures would apply to more complex statements about necessary and sufficient conditions. Indeed, the suspicion is borne out. Consider the law that an event, B , is a necessary condition for an event, D , if and only if D is a sufficient condition for B .² This law can be symbolized

$$(1) \quad (D \textcircled{N} B) \equiv (B \textcircled{S} D).$$

1. It would be better to use 'event-type, B ,' or 'an event of type B '.

2. Skyrms, Brian, *Choice and Chance*, pp. 47-51.