

Richard Dawid, "Underdetermination and Theory Succession from the Perspective of String Theory"
 Philosophy of Science, 73(2006), 298-322

Background	Against	For
	String theory (ST) p.299	ST p.299
	<ul style="list-style-type: none"> • No "direct empirical evidence" • "a highly incomplete theory" 	<ul style="list-style-type: none"> • strong position in physics • strong influence on adjacent fields

Claim I Good reason now to accept ST

(General?) Contextual reasons. (Section 3)

① No choice 3-1
 Locality causality unitarity continuity → No point particles → strings

② Analogy to discovery standard model 3-2
 std model Theoretical arguments → unique theory later confirmed
 Expert same for ST

③ Internal coherence 3-3
 ST → surprising coherence in explaining (a), (b), (c) ...
 "miracle ... if entirely misguided"

Reasons specific to String Theory (sect 4)

① ST is { Highly predictive (at low energies??) Structurally unique (= No free parameters) No variety models } → several such theories with same empirical implications nearly same must be considered highly improbable" p.312

② ST SAYS it is Final theory. Duality connects predictions at all scales. p.316-8

Claim II "scientific underdetermination" fails

p.302 Present empirical data does not fix theory.
303 many theories adequate to data

Automatic from claim I.



New conceptions

• theory acceptance via internal theoretical arguments

p.302

• New conception scientific progress p.318+

series of many theories \Rightarrow replaced by \Rightarrow working out the details of just one theory (ST)