

### 5.3.2. Detachment

The conditional was described by the philosopher Gilbert Ryle (1900-1976) as an ***inference ticket***: it confers the right to travel from its antecedent to its consequent in an inference. It is the ability to make this trip that we demonstrate when we use a hypothetical argument to show that a conditional conclusion is valid. It is also true that, when we have a conditional as a resource, we have a ticket we can use to travel from its antecedent to its consequent.

The pattern of argument employing the latter idea, traditionally known as ***modus ponens***, is perhaps the most well-known logical principle. The following instance of it was used by the Stoics as their standard example:

$$\begin{array}{c} \textit{If it is day, it is light} \\ \textit{It is day} \\ \hline \textit{It is light.} \end{array}$$

The hedged character of the conditional means that, like disjunctions and *not-both* forms, it has no definite implications concerning the truth value of either of its components. *Modus ponens* tells us that if we add to the conditional the information that its antecedent is true, we can detach the consequent and assert it categorically.

In the traditional system of terminology we used for other detachment principles, this pattern of argument deserves the name *modus ponendo ponens*, and the more common form *modus ponens* is an abbreviated form of this. As was the case with disjunction and the *not-both* form, we have a pair of detachment principles for the conditional. However, due to the asymmetry of the conditional, these two principles take different forms and have different names:

***Modus ponendo ponens***:  $\phi \rightarrow \psi, \phi \Rightarrow \psi$

***Modus tollendo tollens***:  $\phi \rightarrow \psi, \overline{\psi} \Rightarrow \overline{\phi}$

The second is most often known by the abbreviated name ***modus tollens***.

Notice that the conditional premise is used in very different ways in these two arguments. Often people who can agree about

the truth of a conditional will disagree of the truth values of its components and will be ready to follow these different paths, something that is reflected in the proverb *One person's modus ponens is another person's modus tollens*. Ann and Bill may agree that it will rain if the front moves through while Ann, who is convinced that the front will move through, concludes that it will rain and Bill, who is convinced that it will not rain, concludes that the front will not move through.

Also as was the case with the weak compounds considered in the last two chapters, there are weakening principles for the conditional; but again we have two different forms:

**Weakening:**  $\psi \Rightarrow \varphi \rightarrow \psi$  and  $\overline{\varphi} \Rightarrow \varphi \rightarrow \psi$

Although these weakening principles can be used directly as attachment rules (and we will consider this use in 5.4.2), their most important function is to combine with the detachment principles for the conditional and the law of lemmas to support the detachment rules **Modus Ponendo Ponens** (MPP) and **Modus Tollendo Tollens** (MTT) shown in Figures 5.3.4-1 and 5.3.4-2.

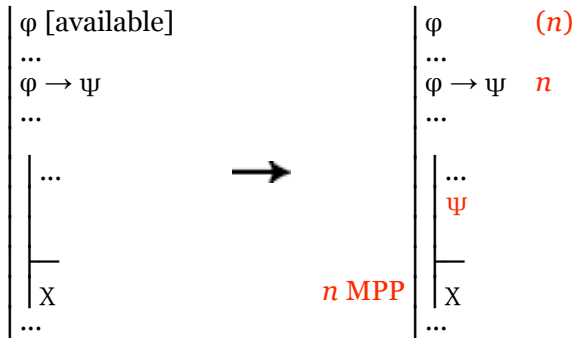


Fig. 5.3.2-1. Developing a derivation at stage  $n$  by exploiting a conditional whose antecedent is also an active resource.

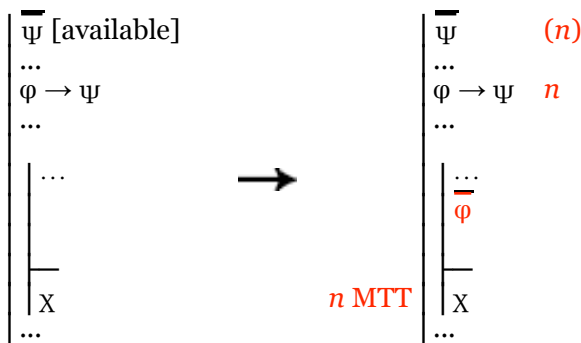
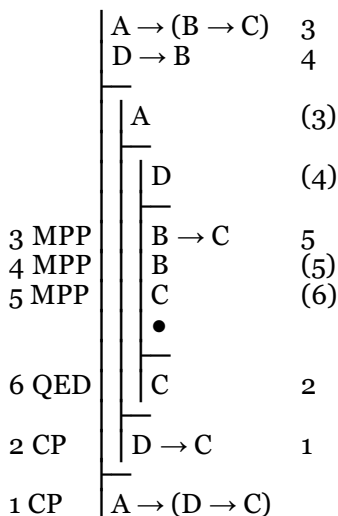


Fig. 5.3.2-2. Developing a derivation at stage  $n$  by exploiting a conditional when a sentence barring its consequent is also an active resource.

The following example is typical of the way *modus ponens* functions along with CP.



This can be described, very roughly, as a process of cashing in some tickets in order to get a new one with a different itinerary. One of the respects in which this metaphor works only roughly is that the “point of departure” or “destination” are sometimes themselves indicated by conditionals—that is, the “ticket” in question is sometimes more like a voucher for a ticket or another sort of more abstract right.