- causal effect requires prior intervention (sometimes called action)
- variables that can be manipulated / changed

⇒ "no causation without manipulation" (Holland, 1986)

- immutable variables used as treatment (race, age, gender)
  ↳ difficult for causal inference interpretation
  ↳ these treatment variables are immutable (i.e. cannot be manipulated)

Manipulable (intervention)	Not manipulable (no direct intervention)
Name on resume ←	Race
Surgery type ←	Obesity
(Gift of money) ←	Socioeconomic status
↳ [give person extra money and then observe your outcome behaviour]	

- treatment ≡ exposures are thought of as interventions
→ non-manipulable exposures do not fit well to the potential outcomes framework !

⇒ we focus on causal effects of hypothetical interventions because

   (1) their meaning is well-defined

   (2) potentially actionable (↳ allows to propose appropriate interventions)

- when $Y^0 \neq Y^1$, then we can say that treatment A has a causal effect on Y

Fundamental problem of Causal Inference:

⇒ we can never compute/determine unit level causal effects B/C
   for each person we can only observe one of the potential outcomes
   ↳ however: we can estimate population level (average) causal effects