Exercise 4.1 (corrected again). Show that CP3 is closely related to (4.3) in the following sense. Suppose that μ is a function from pairs of events to $[0,1]$ (that does not necessarily satisfy any of CP1–3). As usual, identify $\mu(U)$ with $\mu(U|W)$.

(a) Show that if $\mu(A|B) = \mu(A \cap B)/\mu(B)$ for all A, B such that $\mu(B) > 0$, then $\mu(V|U) = \mu(V|X) \times \mu(X|U)$ for all $V \subseteq X \subseteq U$ such that $\mu(U) > 0$ and $\mu(X) > 0$. (This essentially says that (4.3) implies a special case of CP3.)

(b) Show that if μ satisfies CP3, then μ satisfies the special case of (4.3) where $V \subseteq U$.