

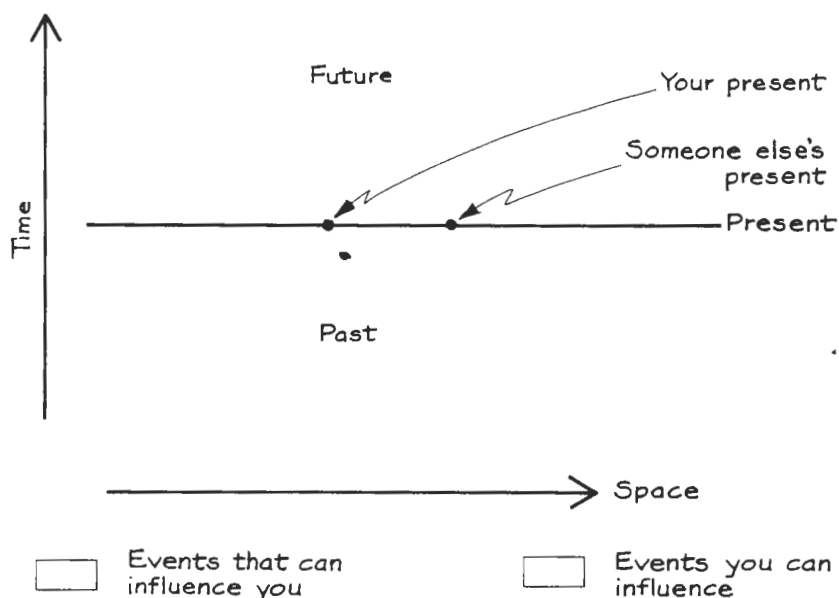
INTERLUDE 1

Past, Present, Future, and Elsewhere

Reflecting on the conclusions of the special theory of relativity, our concepts of time become influenced by space. Most of us divide time into three regions—past, present, and future. The present is not really so much a region of time as it is a “dividing line” between the past and the future (Figure 1). Your future is any event you can still influence. Before Einstein’s introduction to the special theory of

relativity, we assumed that we shared a common past with our contemporaries. Along a common “present” line, all of us share the same past and the same opportunity to influence the future. No restriction is placed upon where in space events occur—only on when, relative to the present, the event occurs.

The special theory of relativity forces us to modify these ideas. When Einstein showed



that the speed of light was the maximum speed for all objects, our personal concept of past, present, and future changed. To be influenced by an event which occurred in the past, we must have received information about that event in our present. An event cannot influence us if it occurs so far from us that information traveling at the speed of light cannot reach us. An event that occurs now in a galaxy 1 light-year away cannot affect us today, tomorrow, or even next month simply because we will not receive any information about it until next year. It may, however, affect us next year. By the same token, events simultaneous to our present cannot affect us at this moment. You cannot be influenced nor can you influence something that is happening at this very moment—be it 100 meters away, 100 kilometers away or 100 light-years away. Perhaps at some later time, when

knowledge of the event has reached you, it can affect you and, thus, become part of your past. Your present, however, cannot be affected by an event simultaneous to it.

This realization restricts the events both in the past and in the future that are related to your present. As shown in Figure 2, the finite speed of light actually restricts your past and future to two cones that enclose all events in contact with your present. Only those events in the past about which you could have received information can affect your present. Similarly, only those events in the future that can receive information about your present can be affected by it. The other events exist in what we call your “elsewhere”—a region of space-time that includes events too distant in space or too near in time to influence you.

