Deixis, or pointing, is the ability to draw the viewer/listener’s attention to an object, a person, a direction or an event. Pointing is gradually acquired by children, first with the eyes, then with the finger, then with intonation and finally with syntax. The crucial role of digital pointing in language acquisition suggests that all modalities of pointing may share a common cerebral network. An fMRI study of the production of multimodal pointing was carried out on 15 subjects. Subjects were scanned during the execution of index finger pointing gestures, eye pointing gestures, prosodic pointing (focus) and syntactic pointing (extraction). The results of a random effect group analysis show that the left superior parietal lobule (BA 7) was activated in all three digital, ocular and prosodic pointing but not in syntactic pointing. These results indicate that pointing in different modalities may recruit the left superior parietal lobule, with ocular pointing more anterior than prosodic pointing, itself more anterior than digital pointing. A grammaticalisation process is suggested to explain the lack of parietal activation in syntactic pointing.