This paper investigates the acoustic effects of source interaction in fricative speech sounds. A range of parameters has been employed, including a measure designed specifically to describe quantitatively the amplitude modulation of frication noise by voicing, a phenomenon which has mainly been qualitatively reported. The signal processing technique to extract this measure is presented. Results suggest that fricative duration is the main determinant of how much the sources overlap at the VF boundary of voiceless fricatives and that the amount of modulation occurring in voiced fricatives is chiefly dependent on voicing strength. Furthermore, it appears that individual speakers have differing tendencies for amount of source-source overlap and degree of modulation where overlap does occur.