

CHAPTER 4. CONSEQUENCES AND CRITICISMS OF THE LIKELIHOOD PRINCIPLE AND RELATIVE LIKELIHOOD PRINCIPLE

Most people who reject the LP do so because it has consequences they do not like. Of course any theory deserves to be rejected if its consequences are erroneous, but great care must be taken in making sure that the consequences really are wrong and not just in opposition to the intuition currently dominant in the field. In this section we discuss some of the more surprising consequences of the LP and RLP, and investigate the conflicts with prevalent statistical intuition. It will come as no surprise that we feel that the conflicts are always resolved in favor of the LP and RLP.

4.1 INCOMPATIBILITY WITH FREQUENTIST CONCEPTS

4.1.1 Introduction

The philosophical incompatibility of the LP and the frequentist viewpoint is clear, since the LP deals only with the observed x , while frequentist analyses involve averages over possible observations. It cannot be said, however, that any particular frequentist procedure conflicts with the LP, since the procedure could happen to correspond to a sensible conditional procedure. Such a correspondence does, in fact, occur in many statistical situations. For instance, much of frequentist normal distribution theory inference provides the same numerical measures of "confidence" as does noninformative prior conditional Bayesian theory (because of the symmetries or group structure of the problem), although the interpretations of these measures are different. (A cynic might argue that frequentist statistics has survived precisely because of such lucky correspondences.) Nevertheless, enough direct conflicts have been