

Partnerships in birds are rarely coincidental assemblages of members of a population (Catry, Ratcliffe and Furness). In fact, of all bird species, over 90% are monogamous (Lack 1968). However, in terms of the length of the relationship, there are numerous levels of fidelity to a partner (Wickler and Seibt 1983). Divorce rates vary among monogamous species, in relation to differing life histories that influence the costs and benefits of pair fidelity and divorce (Choudhury 1995). For example, the Australian raven (*Corvus coronoides*) (Rowley 1973) and wandering albatross (*Diomedea exultans*) (Tickell 1968) rarely, if ever, divorce while the house martin (*Delichon urbica*) (Bryant 1979) divorce 100% of the time. When both members of a pair survive to the next breeding season, they have the choice of breeding with a different mate (divorce) or re-pairing with their old mate. Though many investigators will define divorce to suit the particular needs of their study, it is generally accepted that a divorce is said to occur when both members of a breeding pair from the previous season are present within the population but not paired or are paired with another mate in the following season (Catry, Ratcliffe and Furness). However, mate desertion occurs when one member (the deserter) of a pair deserts the other member (the tender) while young are still present in the nest and not fully grown. Though the occurrence of this behavior varies with numerous ecological factors, it is typically characteristic of one sex.

Many studies have focused on mate desertion and divorce specifically in birds although it has been observed in other species. (Orell, Rytokoien and Koivilla 1994, Desrochers and Magrath, Kelly and Kennedy 1993). Though both incur costs and benefits, such behaviors are thought to occur when the benefits of deserting or divorce outweighs the cost of remaining faithful (Trivers 1972, Dawkins and Carlisle 1976,

Boucher 1977, Maynardsmith 1977, Alexander and Borgia 1979). Therefore, in both instances, the deserter(s) is (are) able to increase his/her own fitness by re-pairing and producing additional offspring. Though some investigators do not distinguish between divorce and desertion, this paper will attempt to describe these behaviors separately. However, both mechanisms often share hypotheses, causes, consequences and costs and benefits, with the common factor being the opportunity to increase an individuals reproductive fitness, thereby increasing his/her gene frequency in future generations.

Many theories have been suggested to explain the occurrence of divorce in birds. Choudhury (1995) described and defined several hypotheses for divorce. First is the incompatibility hypothesis. It predicts that divorce occurs when both members of a pair are unsuccessful breeders when paired even though, separately, they may not exhibit intrinsically negative characteristics (Coulson 1972, Rowley 1983). In this scenario, both members benefit from re-pairing and divorce occurs mutually though early in the relationship. The better option hypothesis dictates that divorce will occur when one member can improve its reproductive success by re-pairing with a higher-quality mate (Davies 1989, Ens et al. 1993). One member will leave the other when the probability of finding a better quality mate is high. The error of mate choice hypothesis suggests that divorce may occur as a result of errors made in the original choice of a mate (Johnston and Ryder 1987). The extra-pair paternity strategy has been proposed to increase the reproductive success of a male because it allows him the opportunity to breed with more than one female and increase the number of offspring produced (Birkhead and Moller 1992). This often occurs within one season. The musical chairs hypothesis is centered around the idea that individuals may settle on the best available territory and not mate

upon arrival following migration. However, divorce may also occur as a result of accidental mate loss coupled with the urgency to re-pair quickly to avoid reproductive costs or losses. Owens et al. (1998) described this as the accidental loss hypothesis. Lastly, the forced divorce hypothesis describes a situation where a third individual intrudes on a pair and divorce ensues (B. Taborsky and M. Taborsky, pers. comm.).

The occurrence of mate desertion is typically more seasonally based but can also be supported by several of the hypotheses for divorce. The better option hypothesis, the error of mate choice hypothesis, the extra-pair paternity hypothesis and the forced divorce hypothesis can all be utilized to explain the theories surrounding an episode of mate desertion. A reproductive attempt may be aborted by the parents and the offspring abandoned when environmental conditions endanger adult survival (Schreiber and Ashmole 1970, Kynnard 1978, Nelson 1978 and Tait 1980). Though rare in birds, desertion may also occur when one parent is able to care for the offspring as effectively as two parents. By re-mating or avoiding parental duties, the deserters increase their own fitness (Beissenger and Snyder, Lack 1968, Oring 1982).

Questions:

Q1: Name one cost of mate desertion for the deserter

Q2: Name one benefit of mate desertion for the deserter

Q3: Describe two conditions under which desertion is selected by natural selection according to the Parental Investment theory