

**FIGURE 5.1** Monkeys and apes regularly transfer into a new social group before they reproduce.



limits for marriage; in another, they may be considered members of different “families” and, thus, ideal marriage partners. However, cultural rules forbidding *incest*, or sexual relations with close kin, do not always succeed in preventing such relations from occurring.

Table 5.2 summarizes the effects of the four standard evolutionary processes on gene frequencies within and between populations.

### Microevolution and Patterns of Human Variation

**Gene Flow** As we have seen, phenotypic variation in different human populations does not require different alleles for different populations; rather, the variation we find mostly involves differences in the proportions of the same sets of alleles common to the human species as a whole. Therefore, genetic relationships between interbreeding human groups are best understood in terms of gene flow between superficially distinct populations whose gene pools already overlap considerably. For example, we know that individuals from European and

African populations have interbred considerably since Europeans brought the first Africans to the New World as slaves. Similar processes have mixed the genes of these and other in-migrating populations with the genes of indigenous American populations. These are examples of gene flow among populations of a single species that had experienced relative isolation in the past but that continued to exchange enough genes often enough with neighboring populations to prevent speciation.

Accidents of geography and history had allowed for relative isolation between these populations prior to the European voyages of exploration in the fifteenth century. From the fifteenth century on, similar chance factors brought them together. Moreover, the way in which reproductive isolation ended was powerfully shaped by the social and cultural forces that brought Europeans to the New World in the first place, structured their relationships with the indigenous peoples, and led them to enslave Africans. Similar cultural forces continue to affect the degree to which different human populations in the Americas remain reproductively isolated or exchange genes with other populations.

**TABLE 5.2** Effects of the Four Evolutionary Processes on Variation within and between Populations

EVOLUTIONARY PROCESS	VARIATION WITHIN POPULATIONS	VARIATION BETWEEN POPULATIONS
Mutation	Increases	Increases
Gene flow	Increases	Decreases
Genetic drift	Decreases	Increases
Natural selection	Increases or decreases	Increases or decreases