EPIMELETIC BEHAVIOR

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In the marine mammal literature, the term "epimeletic"—described as caregiving, nurturant, succorant, or supportive—has largely referred to the behavior of an adult that, sometimes assisted by one or a few others, consistently stays near a distressed, injured, or dead individual, keeping it afloat, carrying it, protecting it from apparent danger and engaging in rescue attempts (Norris and Prescott, 1961; Caldwell and Caldwell, 1966). Because epimeletic behavior has been described more often in cetaceans and less often in other marine mammals, this review refers primarily to cetaceans. Caregivers of known sex are mostly adult females, often confirmed or inferred to be mothers. Exceptions include male humpback whale (*Megaptera novaeangliae*) escorts (Pitman et al., 2016), an adult male short-finned pilot whale (*Globicephala macrorhynchus*) carrying a dead calf in his mouth (Baird, 2016), and a female common bottlenose dolphin (*Tursiops truncatus*) providing most of the epimeletic care to another female's dead calf (Quintana-Rizzo and Wells, 2016).

Observations of epimeletic behavior include protection of calves attacked by aggressive males or by predators, as well as attempts to help calves and adult conspecifics in difficulty, e.g., wounded or entangled. Epimeletic behavior toward living conspecifics has a clear adaptive significance (Connor and Norris, 1982). However, its evolutionary meaning becomes more obscure when targets are dead and decomposing conspecifics (or parts thereof; Moore, 1955), individuals and carcasses of other species, or even objects. Epimeletic behavior toward dead conspecifics has been featured in many published reports (reviewed by Reggente et al., 2016), possibly because of the ease of spotting floating carcasses or animals carrying them at the surface. Observations conducted until the early 1970s often refer to deliberate harming and killing of animals "for science," resulting in occurrences of epimeletic behavior. The target is often a calf, with a few cases involving subadults (Fig. 1). Most reports are anecdotal and lack quantitative observations either prior to death or until the dead is abandoned by the caregiving individual (in several cases the carcass was removed by the observers). Among odontocetes, epimeletic behavior typically involves stationing near the carcass or actively carrying it on the dorsum or melon, lifting it above the surface, holding it in the mouth, bringing it to the surface when it sinks, taking it underwater during dives, and sometimes vigorous strikes (Reggente et al., 2016). Similarly, sea otters (*Enhydra lutris*) were observed grooming and caring for their dead pups for days, also carrying them underwater (Kenyon, 1969). Hartman (1979) suggests that West Indian manatees (*Trichechus manatus*) may not assist distressed or wounded individuals, but reports the case of a female that kept her dead calf afloat for 2 days. Few reports exist of epimeletic behavior among pinnipeds and sirenians (e.g., Trudeau, 1976; Allen, 1980). Caregiving cetaceans and sea otters may behave aggressively or defensively toward intruders, and if the dead individual is taken away or it naturally strands, they may follow or remain in the area for some time.

Figure 1 *Striped dolphin* Stenella coeruleoalba *"grieving." This adult individual of unknown sex performed epimeletic behavior toward a dead conspecific (a subadult female) in the Gulf of Corinth, Greece. Photo by Silvia Bonizzoni/Dolphin Biology and Conservation.*

When directed toward a dead conspecific, epimeletic behavior has been related to mourning or grieving. Grieving appears to provide no benefit to the griever, and the costs of this behavior may be high. Initially, epimeletic behavior may be intended to contribute to the recovery of individuals that only appear to be dead, with an unknown potential for rescuing an offspring or companion. Subsequently, social bonds providing a strong motivation to rescue and an unwillingness to leave the dead may prompt epimeletic behavior to last beyond reasonable hopes of success.

The carrying of a dead infant—or, in its absence, of a surrogate—has been interpreted as the mother continuing to perform her parental role. A bottlenose dolphin mother that lost her calf spent considerably more time with her grandson (Mann and Barnett, 1999), possibly as a form of compensation. A captive beluga whale (*Delphinapterus leucas*) whose dead calf was removed from the pool postpartum started carrying her own placenta, and after the placenta was removed resorted to carrying a buoy for several months (Kilborn, 1994). Smith and Sleno (1986) observed several wild beluga whales carrying a dead newborn, a placenta, planks up to 2 m long, and even the entire skeleton of a dead caribou (*Rangifer tarandus*). The authors postulated surrogate epimeletic behavior following perinatal death of previous calves as a possible explanation. The carriers often show a protective attitude when observers attempt to approach or remove their burden—whether unrelated animals or objects.

Some observations of cetacean behavior toward dead conspecifics have a sexual component and do not appear strictly "epimeletic" (Dudzinski et al., 2003). Several interactions with nonconspecifics also remain unexplained. These include short-finned pilot whales carrying dead California sea lions (*Zalophus californianus*) (Shane, 1994), and a captive female bottlenose dolphin carrying living and dead leopard sharks (*Triakis semifasciata*) (Norris and Prescott, 1961). Interactions between marine mammals and sea turtles (reviewed by Fertl and Fulling, 2007) include harassment and predation, and would not qualify as epimeletic. These and other short-lasting interactions with nonconspecifics and objects may include a playful component (e.g., the interaction between a humpback whale and a bottlenose dolphin described by Deakos et al., 2010). Alternative hypotheses proposed to explain the long-term carrying of nonconspecifics have included practicing of parental skills (Baird, 1998), a "misuse" of a naturally strong epimeletic response (Harzen and dos Santos, 1992), and conferring of a particular social status to the carrier (Shane, 1994).

Some observations of epimeletic behavior toward living calves of other species are suggestive of alloparental caregiving behavior (Gaspar et al., 2000; Wang et al., 2013). Pitman et al. (2016) postulated

interspecific altruism—whether intentional or not—to explain the behavior of humpback whales mobbing mammal-eating killer whales (*Orcinus orca*) to protect other cetacean species, as well as pinnipeds and one ocean sunfish (*Mola mola*). Future research should clarify whether long-lasting usage of the term "epimeletic" (with emphasis on odontocetes) is justified, or more appropriate terminology should be employed to characterize complex behavioral patterns triggered by kin selection, reciprocity, or altruism—leading to rescue and rehabilitation attempts, or to bereavement and stereotypic behavior.

See Also the Following Articles

Aggressive Behavior, Intraspecific ■ Female Reproductive Systems ■ Parental Behavior ■ Playful Behavior ■ Reproductive Behavior ■ Sociobiology

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ETHICS

Toni Frohoff and Marc Bekoff

I. Marine Mammals and Humans: Obligations and Opportunities

Steven Kellert's classic study of American perceptions of marine mammals and their management shows that most people support the various goals of the U.S. Marine Mammal Protection Act. That is, they claim they are willing to "render significant sacrifices to sustain and enhance marine mammal populations and species … These findings clearly indicate that marine mammals possess considerable aesthetic, scientific, and moral support among the great majority of Americans today" (Kellert, 1999, pp. iv–v).

Humans often attempt to identify human traits that distinguish themselves from other species. But, as science documents some of the dwindling differences between humans and other animals, we find that the variations are more of degree rather than kind, except for one—our capacity to impose unparalleled, and sometimes irreversible, negative impacts on our shared environments (Marino et al., 2012). It is poignantly ironic that features we laud as making us exceptional and "uniquely human," such as technology and manufactured dominance over the "natural world" from which we largely consider ourselves separate, have now cumulated into an unprecedented era in which, for the first time, the actions of one species threatens the survival of all on earth, leading us into an era now officially called the Anthropocene.

There are many important and challenging issues that demand serious consideration in discussions of the ethics of how human beings interact with, and impact, other animals. Marine mammals, particularly cetaceans who sometimes express a distinctive curiosity for humans, are among the species considered most like humans in terms of cognition, sophisticated communication, sentience, altruism, and sociability within their own species and even toward humans. The relationships between humans and marine mammals illustrate some of the most juxtaposed, complex, intricate, and vexing yet promising moral considerations of ethical and socio-political policy and practice. Their complexity is compounded because highly charged subjective opinions and passions run high. This article highlights just how complex and multidimensional these issues are. It is