BIO 45 – Lect. 3 -2 – Parental Care

*** I depart from Alcock in how I cover parental care. You are responsible for both perspectives.***

I. PARENTAL CARE

A. **Natural History** - Who cares for the offspring?

GROUP	Only Females	Both Sexes	Only Males	No P-care
Solitary Insects	MANY**	FEW	FEW	**MOST**
Social Insects	**MOST**	FEW	---	----
Amphibians	SOME (IF)	---	SOME (EF)	**MOST**
Fish	SOME (IF)	SOME	MANY(EF)	**MOST**
Birds	SOME	**MOST**	FEW	----
Mammals	**MOST**	SOME	---	----

** number of species --- (IF) = internal fertilization, (EF) = external fertilization

B. **Messages** - Parental care is relatively rare. A focus on mammals and birds distorts the picture. Question is what are the relative costs and benefits to both sexes of 1) any care at all, and 2) care of current offspring versus investment in future offspring

C. T**heory** – Fish are a great group to explore the theory with because of the large number of species and the great variation in parental care tactics! See Alcock for details.
A number of factors seem to commonly be associated with parental care

1. **ecological necessity** – Do both parents have to care for young if the young are to survive? Probably rare in fish, more common in birds and mammals
2. **confidence of paternity** – Males shouldn't care for offspring that are not theirs. An interesting correlation exists between external fertilization (male generally more certain of paternity) and paternal care in fish. The correlation can be misleading. Confidence of paternity will not, in itself, select for paternal care. However, paternal care is not likely to evolve if the male lacks confidence of paternity..
3. **gamete order**. – Whoever puts the gametes down first can desert and leave the other to care for them. Assumes that the sex "stuck" with zygotes loses more by also abandoning than by staying. Again a correlation exists between external fertilization and male parental care -- with external fertilization females are the first to release their gametes (the opposite of internal fertilization).
4. **association** - relative effectiveness of care. Who is in best position (physiology, behavior) to care for young? In many fish with paternal care males are territorial, guarding a nest where eggs develop. A nest with eggs in it may also attract other females. Thus the costs of paternal care are reduced by the fact that guarding eggs adds little cost to maintaining a territory and may increase chances for mating. .(See Alcock Ch 13 for more details)
5. **cost to future reproduction** - Does it cost one sex more to stay with zygotes than to start investing in future reproduction? For fish, this is related to "indeterminate growth". Most fish grow throughout their lives and female size is directly correlated with fecundity. Thus parental care by female fish may takeaway from energy devoted to future growth which, in turn, reduces future reproductive output. Males may also gain reproductive ability by getting larger, but generally not as much as females. .(See Alcock Ch 13 for more details)

II. Parent-Offspring Conflict and Sibling Rivalry

A. Think about how the fitness interests of parents and offspring may be in conflict. What, ideally, would each offspring want from its parents in terms of investment? When would parents have higher fitness by not meeting those "demands"?

B. Alcock talks about parental favoritism (pp. 411-417) which I'll refer to as a combination of parent-offspring and sibling-sibling conflict.