Guidelines for discussion leadership and participation in BI 416/516

Our primary goals for the discussions include the following:
1) to make sure we understand the significance of the assigned papers and how they apply to some of the primary issues in global change and ecosystem ecology research;
2) to look for broader implications and applications to societal problem-solving;
3) to understand difficulties, potential flaws, or methodological issues with the work.
In all cases, we want to stick to the scientific issues and avoid wide-ranging philosophical peregrinations.

I. Annotated bibliography.

To meet the primary goals just mentioned, discussion leaders provide an annotated bibliography focusing on papers that help to understand the context and significance of the assigned papers (6 paper minimum in addition to the assigned papers). See guidelines, below. The background papers should consist of three main types:

1) papers cited by the assigned papers that are important for understanding the overall scientific questions/contexts posed by the assigned paper (at least 3);

2) studies that are similar to the assigned papers for comparison of the results (i.e., how general are they, do any studies provide contradictory evidence or other interpretations?); and

3) more recent papers that cite the assigned papers and which may provide either updates or contradictory or confirmatory results. This is critical for papers over 5 years old.

You need to have a balance among these three categories after meeting the minimum requirement for type 1 papers, although for more recent papers (within the last year or two), type 3 papers are not as critical.

II. The discussion leader will start with a brief introduction, using the following criteria.
A. Start with a short overview of the readings:

1. Briefly describe the main points of each paper.
    a. What driving question(s) led to the studies described (i.e., what was the scientific context)?
    b. What were the primary points the paper made in answering the question(s) posed? I strongly suggest writing these on the board or putting them on an overhead to help provide a focus for discussion.
2. Briefly describe any themes that link the papers (besides the obvious relationship to the chapter/lecture of the week). <u>Provide the main points, themes and your discussion questions to the rest of the class AT LEAST 2 DAYS prior to the discussion you are leading</u>. Please send them to me by email, and I will forward them to the rest of the class. This will give everyone a chance to think about them before class.
3. Papers for co-led discussions have been explicitly designed to bring out scientific debates and controversies. Your mission, should you choose to accept it (you already have), is for each of the co-leaders to take different sides of this debate. You will need to be familiar with each others' topics for effective discussion, however.
4. Take NO MORE THAN 15 MINUTES to give the overview, to allow adequate time for discussion.

B. Ask if there were any terms or concepts with which people had difficulty. Discussion leaders are responsible for knowing and being able to clarify to others the basic terminology and concepts of the assigned papers.

C. Ask for general agreement or disagreement with the points you brought up in IIA, above.

1. If people have other questions, points or themes that they felt were important, then add these to the list on the board/overhead and use these differences as a basis for further discussion.
2. People not leading discussion are responsible for reflecting on the main points (and questions) and deciding if they agree or disagree, and why (with supporting points from the papers). I expect that everyone will have something to say about the main points each week.

III. Moderate the discussion.

We will have about 1 1/2 hours for discussion following the introduction, but this time can go quickly, especially with a large class. I will be available to help if things get too off-track or for difficult questions, but I want to minimize my talking (I do enough of that in lecture). The discussion leader and class are primarily responsible for keeping things going. Aim for:

A. Balance among the assigned papers (if there is more than one) and among sections of the paper (i.e., don't let discussion get hung up on details of the methods and thereby miss the main points).

B. A focus on the main messages – avoid getting bogged down in too many little details. Clarification of terminology, etc. (point IIB above) is important if misunderstanding makes it hard to grasp the paper. But at some point, the main messages should be clear even if not absolutely every vocabulary word is covered.

C. A balance among speakers in the class. Don't let the discussion be dominated by one or a few vocal people; the leader should ask questions directly of people who have been particularly quiet or less represented in the discussion. EVERYONE should have input to the discussion EVERY week. Since we have 1 ½ hours, this should be possible even with a large class, but if the leader noticed the week before that certain people didn't or weren't able to participate as much, then start out by focusing on them.

IV. Discussion grade

Your grade for leading the discussion (50 points total) will be divided among the following categories, based on the above descriptions:

A. Annotated bibliography (20 points)
   1. Meeting the minimum number of six total background papers and three type 1 (above) background papers.
   2. Clarity, completeness and concision of the paper descriptions.
   3. Appropriateness of the papers chosen.

B. Discussion intro (15 points)
   1. Clarity and insightfulness of the discussion questions posed.
   2. Clarity and insightfulness of the scientific context/questions, main points, and linking themes.
   3. Ability to clarify basic terms and concepts to the class.

C. Discussion moderation (15 points)
   1. Balance among papers
   2. Balance among speakers
   3. Keeping the focus

Guidelines for Literature References and Annotated Bibliography

These are suggestions for putting together your annotated bibliography for BI 516. This is slightly amended from Roger Anderson's Invasions seminar in Fall 2003 (thanks, Roger). You'll need a total of six references in addition to the assigned readings. These can be critical background papers cited by the assigned articles, other studies coming up with contrasting or complementary results, or more recent papers that provide an update of information or findings. I suggest searches on Web of Science, available on Western's library web site. If there are a few identifiable categories of references, you may want to separate your list of references and annotations into subheadings, otherwise they should be alphabetically arranged. An annotation is just a brief synopsis of the article and is commonly eight to twelve lines long (~ 1 inch margins, 10-12 point font). NOTE: Copying the abstract will not suffice, since many abstracts are a bit on the "promotional" side and may not include all the necessary information. At the minimum, you need to include your evaluation of the article and how it relates to the discussion articles/topic as well. The annotation generally should include, but is not restricted to:

- ✓ A brief, succinct description of the major question(s) that the paper addresses, perhaps including the rationale. You should explicitly include a statement of how this paper relates to the main topic of the discussion and assigned primary discussion paper. **Also** state if this is a "type 1" reference – that is, one that was directly referenced by the assigned paper.
- ✓ Brief comments about the type of scientific article; that is,
    a) does the paper report on empirical research that is observational, comparative, or experimental, and was the work conducted in the field, a mesocosm, or in the lab, or
    b) does the paper focus on theory or
    c) is it a review paper?
- ✓ Are the assumptions and predictions clearly stated and are the methods used and data generated able to distinguish among alternative hypotheses, or do they provide background or context for future research?
- ✓ What organisms/ecosystems are the subjects of this paper?
- ✓ What are the principal contributions (e.g., ideas, data) of the paper?
- ✓ Please evaluate the quality of the contributions. First, try to state whether and how Title, Abstract, Introduction, Methods, Results, and Discussion are flawed. Or, if data sets and statistical results are robust, or if figures and tables are useful and noteworthy, then mention so. Are the Introduction and Discussion comprehensive and convincing?
- ✓ Indicate whether the paper is one of a series, or is the seminal paper in the series, or cites many earlier references.
- ✓ It can be useful to include a scan of one or a couple of the key figures from the article, but this is not required.

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Some examples of annotated references are on the following pages.

Four annotated references that meet *some* of the standards suggested above are presented below, and another approach to meeting the standards suggested above are presented on page 3.

Deaton, L.E., T.J. Hilbish and R.K. Koehn. 1984. Protein as a source of amino nitrogen during hyperosmotic volume regulation in the mussel *Mytilus edulis*. Physiological Zoology 57: 609-619.

This paper looked at how the Lap^{94} locus for aminopeptidase-I (AP-I) responded to hyperosmotic stress in mussels, particularly in the accumulation of free amino acids (FAA) and ammonia excretion. The Lap^{94} allele is more active than the other two alleles, and therefore FAA accumulation in tissues of mussels with this allele were greater. Also, mussels with Lap^{94} had a 50% greater ammonia excretion rate than the other alleles when transferred from high to low salinity. The results show that cell volume regulation due to changes in salinity is done through protein catabolism. This is one of the first papers done on the LAP locus in *Mytilus edulis*, and provides the starting point to further look at allelic differences and their affects on this mussel.

Bardwell,E., Benkamn,C.W., and Gould, W.R. 2001. Adaptive Geographic Variation in Western Scrub Jays. Ecology 82(9): 2617-2627.

This laboratory study explores the geographic variation in bill shape and size, reflecting the variation in food availability and different resources among the Western Scrub-jays (*Aphelocoma californica)* from pinyon-juniper woodlands versus the oak woodlands. It was clearly found that scrub-jays inhabiting habitat dominated by either pinyon-juniper (pine) or oak had adaptive bill structure. Bill size and shape differed between the two types of jays studied, exhibiting geographic variation among the birds. These results are consistent with observed geographic variation not only within this study as well, other relevant studies.

Martins, E.P., Bissell, A.N., and Morgan, K.K. 1998. Population Differences in a Lizard Communicative Display: Evidence for Rapid Change in Structure and Function. Animal Behaviour 56: 1113-1119.

This was a focal animal observational study performed in both Eastern Oregon as well as Northern Utah. Push-up differences were observed among three different populations in an attempt to better understand the differences in communicative display. Changes in communicative display can lead to reproductive isolation as well as speciation and are important in detecting changes occurring within and among the populations. A total of 564 displays were witnessed and combined with previously collected data from Southern California. It was found that display frequency varied among individuals, between sexes, and between populations. Compared to other types of communicative strategies, this study suggests that structure and function of the push-up display may be more plastic or more quickly evolving than many other types of communication.

Snyder, L.R.G., J.P. Hayes and M.A. Chappell. 1988. Alpha-chain hemoglobin polymorphisms are correlated with altitude in the deer mouse *Peromyscus maniculatus*. Evolution 42: 689-697.

They studied the frequency of alpha-globin and beta-globin haplotype and base-line blood oxygen affinity in deer mice in the western U.S. in relation to altitude and subspecies. They found that these three factors show strong correlations with native altitude. However, they are not sure if it is due to subspecific or altitudinal effects in all of them, because only alpha-globin haplotype frequency showed correlation with altitude after subspecific effects were removed. A couple of nice things that they did was to try and remove gene exchange by using a regional rather than local altitude, and to remove subspecific effects using ANCOVA. This was one way to try and get good results, although it ended up with mixed results.

Relationship of Morphology and Locomotion in Reptiles
Ellen Ward

Avery, R.A., C.F. Mueller, J.A. Smith and D.J. Bond. 1987. The Movement Patterns of Lacertid Lizards: Speed, Gait and Pauses in *Lacerta vivipara*. Journal of Zool. London 211: 47-63.

Type of study: This study is a combination of a field and laboratory study. The study was to determine the movement patterns of *L. vivipara* lizards, quantitatively.
Context/Value: This study examines the movement patterns of lacertid lizards during both foraging and escaping. The different gaits were easily assigned to foraging or escape behaviour but the pauses associated with these lizards are still unexplained. The authors claim that this is one of only a few studies attempting to characterize lizard movement patterns.
Summary: The categories used to describe different movements include: standard, complex, semi-natural, searching, chasing, fleeing and panic. Pattern movements, posture during movement, body size, gait, differing densities of habitat in regards to movement, searching for prey, chasing prey, and escape behaviour were studied. The authors did not conclude the reason for the pausing behaviour of the lizards, allow it was hypothesised that it could be to watch for prey, avoid predation or test the substrate it encountered. It was pointed out that pausing behaviour is common amongst a wide variety of vertebrates, for example, birds.
Key features/Flaws: It was unclear from the methods how many lizards were observed in the field and how many lizards were studied in the lab. This paper was very through in its investigation of movement in the *L. vivipara* lizards. The figures were very informative and easy to read. The tables were a bit on the heavy side to interpret.
Suggestions: No clear suggestion for future studies were made by the authors. It is clear though that further examination of lizard movements need to be examined to be able to clearly and confidently understand the different movements of lizards, especially in regards to the pausing behaviour of the lizards.

Bauwens, D., T. Garland Jr., A.M. Castilla and R. VanDamme. 1995. Evolution of Sprint Speed in Lacterid Lizards: Morophological, Physiological, and Behavioral Covariation. Evolution 49(5): 848-863.

Type of study: Thirteen species of lacertid lizards were studied in a laboratory setting. SVL, preferred body temperatures, sprint speeds as well as the critical thermal maximums were measure for each lizard. Phylogenetic analyses were also determined.
Context/Value: Like many other authors, these authors look at evolution of sprint speed involving the traits of morphology, physiology, behaviour, and also comparing trade-offs. The new twist that makes this study unique compared to other studies is that they attempt to relate possible evolutionary responses to global climate change.
Summary: Interspecific variation in both position and shape of the thermal-sensitvity functions were observed. Given the long divergence time of this clade of lizards, the changes seen were very small. This leaves open the question of whether lacertid lizards would be able to respond to fast changes in the environment through evolutionary changes in their physiology. Optimal temperature and thermal-performance breadth for sprinting have evolved closely with the behavioural trait of thermal preference as well as morphological characteristics of the lizards. The authors cautiously deduce that shifts in composition of the biotic communities may be cause from climatic change, therefore altering selection pressures on sprinting performance and ultimately driving evolutionary changes in thermal physiology responsible for sprinting abilities.
Key Features/Flaws: Unique features include the consideration of the effect of global climate change in relation to the evolution of thermal physiology of the lacertid lizards.
Suggestions: The authors suggest more in depth studies of ecology. These ecological studies should include further study of vegetation densities and where lizards inhabit the vegetation at ground level as well as habitat openness, predator densities and prey densities which all may have an effect on selection pressures. Further more they suggest that comparative methods be used to infer lineage-specific histories of selection.

Name_____

Discussion _____

Your grade for leading the discussion (50 points total) will be divided among the following categories, based on the descriptions in the Discussion Guidelines handout.

D. Annotated bibliography (20 points)

4. Meeting the minimum number of six total background papers and three type 1 (above) background papers.

5. Clarity, completeness and concision of the paper descriptions.

6. Appropriateness of the papers chosen.

E. Discussion intro (15 points)

1. Clarity and insightfulness of the discussion questions posed.

2. Clarity and insightfulness of the scientific context/questions, main points, and linking themes.

3. Ability to clarify basic terms and concepts to the class.

F. Discussion moderation (15 points)

1. Balance among papers

2. Balance among speakers

3. Keeping the focus