

## Appendix:

# Student Papers Written in Response to Assignments in History, Sociology, Psychology, and Biology

On the following pages we present four sample student papers together with the assignments that evoked them. As you can tell from the professors' instructions, the papers have been written under varying circumstances and for different purposes. The first paper is a take-home examination for a history course. The assignment fits very neatly into the general type that we call papers of speculation (see chapter 8). The second paper is a case study of a social group, and for further explanation, you should look again at chapter 10. That chapter will also be helpful in understanding what the student is doing in the next paper, "Mama Rat," but the "Mama Rat" paper is a hybrid in a number of ways. It is more of an exercise than it is a formal paper, and it also depends on approaches presented in chapters 12–14, "Writing in the Natural Sciences." The last paper is a scientific review of current research on the songs of humpback whales. Of the four papers, the scientific review paper might pose the most difficulties because it requires beginning students to read rather sophisticated scientific sources. We think, however, that with the help of chapter 14, you could write a scientific review paper that is at least as good as our sample.

These papers are adequate examples of what beginning college students can do with the designated assignments. These papers are far from perfect, and we know that you will write better ones. Please send us copies of your best.

### History 134: Take-home essay

The purpose of the following question is to encourage you to think about the changes within the Soviet Union during the past twenty-five years. Please answer the question in a clear, focused essay of not more than three typed, double-spaced pages. Assume that your audience includes your classmates and your instructor.

To answer this question you must develop a prediction. There is no right or wrong answer. Your paper will be evaluated on the power of your argument. Have you convinced your readers that your prediction could

come true? It is more important to be logical than it is to be fanciful. Show that you understand Stalin's Russia, Stalin's view of leadership, present-day conditions in Russia, and the relationships among all of these factors. Essays will be evaluated on the consistency of your thesis and argument, the analysis of the data you select, and the general persuasiveness of your essay.

The question: "If Josef Stalin were to return, would he be able to rule the Soviet Union as he did in his own lifetime?"

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#### TAKE-HOME EXAMINATION

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History 134  
October 31, 1999  
Dr. Bette Landman

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#### ACKNOWLEDGMENTS

Most of the information in this paper is derived from lectures, class discussions, and readings in History 134. I also asked my grandmother what she remembered about newspaper accounts of Stalin's Russia.

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Alan Marcus  
History 134: Modern  
Russia

Were Josef Stalin to return, would he be able to rule the Soviet Union as he did in his lifetime?

Josef Stalin was the dictator of the Soviet Union from 1928 to 1953. His main policies included purges of all opposition, forced collectivization of agriculture, and massive investment in heavy industry. He furthered his

*Description of Stalin's policies. These are the criteria that will be used when comparing the two periods (the Soviet Union under Stalin and now) in the remainder of the paper.*

*Thesis: introduction of the line of argument to be taken.*

*Description of the USSR when Stalin ruled.*

*Description of Soviet Union today.  
(Note parallelisms to description of USSR under Stalin).*

*Note the absence of footnotes which would be used if this were a research paper.*

policies at the expense of the people in whose name he was supposed to be ruling. He destroyed the peasant farmers and murdered between five and six million people, including those in the party or military who were in positions to challenge his authority. Stalin was an egocentric madman who demanded complete obedience in everything from industrial policy to art and literature. The penalty for failure to follow his policies was usually death. He ruled to perpetuate his own power. But if he were to return, he would be unable to rule in the same manner. Too much has changed within the Soviet Union.

Stalin's rule fit the age in which he lived. When Stalin came to power in 1928, Russia was a large, disorganized, rural nation, isolated from the rest of the world and populated with people who were used to absolutist rule. Russia was militarily weak and existed in a hostile world filled with capitalists and fascists, and, after 1933, Nazis, who openly talked of invading the Soviet Union. In short, Stalin did have some reasons for his extreme policies of force and terror. In the name of necessity, he could demand obedience to his policy of bringing Russia into the twentieth century. It was a matter of survival as well as an exercise in ego satisfaction.

Today, circumstances in the Soviet Union are totally different. The nation is a giant industrialized superpower. It is militarily secure and, ostensibly, at peace. Consequently, since 1953, successive regimes have chosen to or have been forced to relax the domination of the party in many areas of life. Soviet citizens have been given rights to own private land, to read Western works, to make management decisions in broad areas of industry. Moreover, the Russian people have grown to expect more out of life than they did under Stalin. Citizens have become increasingly accustomed to more comfortable, if still inconvenient, lifestyles, and the Soviet system has had to adjust to providing more consumer goods, especially Western goods. Consequently, expectations have risen and criticism and dissent have become widespread,

for people know that, within broad limits, dissent will not be punished by capricious purges or execution.

*Shows consideration of main counter-argument and shows why the counter-argument is not valid.*

*Analysis of what has been shown.*

*Restatement of thesis for strong ending.*

I do not suggest that there has been any significant shift in the substance of power since 1953. In fact, the party and its apparatus continue to possess a monopoly of political and military power. The dictatorship that Stalin established is still intact so, theoretically, the party could rule as Stalin did. Such a possibility, however, is unlikely. The changes since Stalin's death are more than cosmetic. The circumstances of the people, their attitudes, and their expectations have improved dramatically. Moreover, the changes in the past quarter century have created strong vested interests within the bureaucracy and within the many new industries that have grown up. Stability is too ingrained in the Soviet Union to permit again the rule of another egocentric madman.

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### Assignment sheet: Small group study—Sociology 100

Describe and analyze a small group to which you have belonged or belong now. Some areas you may discuss are the group's norms and values, subcultural characteristics, stratification and roles, ethnocentrism, and social control techniques.

In previous semesters students have written on the following groups: an informal group of camp counselors or campers; a high school clique; an informal friendship group formed on a dorm corridor or in a class; a church social group; an extracurricular club. Do not use your family as the small group.

Your paper must be submitted in draft stages: (1) proposal; (2) work-in-progress; (3) draft for peer review; (4) finished paper. (See your syllabus for due dates.)

Your finished paper should be no more than ten pages, typed, double-spaced. If you write a draft of the paper in English 101 or 102 or if you visit the Writing Center, please include this information on the acknowledgments page. Because we are using peer review, every student must write an acknowledgments page. I encourage you to discuss your paper with friends and other instructors. Sometimes other members of the group that you choose to analyze will remember a detail that has slipped your mind.

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## ANALYSIS OF A HIGH SCHOOL PEER GROUP

Theodore Freund  
Sociology 100  
December 6, 1999  
Dr. Calvin Cameron

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### Acknowledgments

I want to thank the person who served as my peer reviewer (I don't know his name), because the review helped me see some ways I could improve my paper.

I did not use the Writing Center because after the peer review I felt fairly confident about my paper. But I am grateful for the opportunity that we had in English class to discuss this paper assignment. And I especially want to thank my friends, Sid, Rich, and Bart, because writing about our in-group made sociological analysis seem more relevant to me.

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### SMALL GROUP STUDY PAPER: A PRIMARY SOCIAL GROUP

*Establishment of a  
general context for the  
paper.*

Social groups are essential to the definition of human socialization. People belong to many social groups--family, church, school, neighborhood, club. Although, as individuals, we might like to believe that we are independent, free to act as we think and feel, the truth is that much of our behavior is influenced by our social in-group (Horton & Hunt, 1976). This paper describes a primary social in-group that I belonged to, along with three peers. The group was a primary group because the members came together as friends, not for a particular purpose

*Definition of primary group as contrasted with secondary group.*

as would be true in a secondary group like a college classroom or a church choir. Individual members of a primary in-group interact with each other on an intimate basis, with each group member interested in each other group member as a whole person not simply as a performer of particular social roles. In the specified secondary groups, people would regard each other as classmates or as singers. In a primary group, members regard each other as complete people. I will describe the constitution of my primary social in-group as well as the roles of each of the members. I will also give attention to the characteristics and values of the group, its ethnocentrism, and its means of social control.

*These descriptions give the reader the criteria the author used to make judgment of "lower middle class."*

This group consisted of four male friends, Sid, Rich, Bart, and me (Ted). All of the members lived within a four block radius of each other in the Oxford Circle area of Northeast Philadelphia. We were all members of the lower middle class. Sid's father was a fireman; Rich's was a security chief for a large firm; Bart's father drove a truck, and mine was a bus driver. With the exception of me, all of the members of the group were Catholic, although none was practicing his religion. Rich dropped out of school in the ninth grade. Sid and Bart graduated from high school, and I am the only one who has gone to college. We are now all either nineteen or twenty years old, but the group itself held together until we were seventeen or eighteen.

#### Subculture Characteristics: Norms and Values

*Subheading created by combining two of the suggested areas from assignment indicates that the student has created his own organization instead of writing a simple narrative or following, without thinking, the topics as they appear in the assignment.*

The most salient characteristics and values of our group are described below and summarized in Table I. Most features of our behavior were the same as those of other Northeast Philadelphia teenagers, but some characteristics, I am sure, were unique to us. The speech and slang of our group was similar to our peers, including extensive use of four-letter words. However, three of us, all except Sid, knew sufficient German to carry on short conversations. We often spoke in German in the company of others when we either did not want to be understood or we simply

Table I  
Characteristics of Primary Group Evidenced in Culture and  
Subculture of Group

	Culture—Northeast Phila. teens	Subculture of Group
Speech	Includes profanity	--Some use of German in public --Adaptation of Monty Python
Clothes	Jeans, T-shirts, sneakers	Pea coats
Social ritual	Saturday night dances at area high schools or recreation centers	Obtain beer to drink before dance
Attitudes toward fighting	--Acceptable behavior --Fight to win	--Acceptable only if fight was initiated by non-group person --Fighting must be between equal numbers, no "ganging up"

*Concrete examples presented without value judgments.*

wanted to impress people. This private language was also a source of amusement. We especially enjoyed the curious looks of passengers on buses when we spoke in German. Our second "in" language consisted of expressions from Monty Python records and shows. It was quite common to call each other "a sniveling mound of parrot droppings" or "a slime."

*Table I is a good way to illustrate for quick reference the points of similarity and difference between the primary group and their larger culture.*

Our clothes were also pretty much the same as everyone else's in our age group. In the summer we wore jeans, t-shirts, and sneakers. For most dances we wore ties and jackets, but only because they were usually required. We did, however, all wear peacoats in the winter and this piece of clothing set us apart from the usual leather-coated groups. The main purpose for wearing old Navy coats was not related to status, however, but to practicality. They were cheap and warm.

Our primary ritual was the Saturday night dance at one of the local high schools or recreation centers: Father Judge, St. Hubert, St. Basil, and Jardel. We pretty much lived for

*"Primary ritual" is an attempt to describe a group behavior within the language and categories of the discipline of sociology.*

*Emphasis on detail for important descriptions.*

*Attention to language is shown in direct explanatory prose and use of colloquialisms to capture flavor of group language.*

weekends and for these dances. A typical Saturday usually began about noon with four hours of basketball or whatever game was in season. Then we would all go down to the corner store and put up \$1.25 each, and wait for "Psyche Mike," the neighborhood runner. Mike was a twenty-six-year-old epileptic, almost always out of work, who purchased our usual two six-packs of beer in exchange for a dollar, which he would use to buy a beer or two for himself. We would stash our beer in Bart's basement for use later that night.

After dinner at our respective homes, we would meet back at Bart's at six-thirty, sit around and drink beer for an hour, and then leave for the dance. Our routine was upset if we were not able to find Mike in the afternoon, for we would have to meet about six o'clock at the local beer distributor's and try to get someone to go in and buy our beer. Occasionally this strategy did not work, and we had to go to the dance "dry." After we were sixteen and could drive, we sometimes varied our routine by driving over to the bars and clubs in New Jersey, where the drinking age was eighteen, and spending the night there.

Drinking alcohol was our primary way of getting "high." Especially near the end of our six-year association, we thought it acceptable to get drunk routinely once or twice a week. But we thought it a "pretty low life" when Bart once got drunk every night for three months. Drugs were not an important part of our group. Only Bart and I smoked marihuana, and then only for relatively short periods of time, about a year.

Of course, we never thought in terms of "ethical" systems. I believe that our standards and expectations were quite similar to those of other groups in our social class. They were simple and straightforward: you didn't let anyone push you around, especially girls; you never hit your mother, but at the same time, you never did much of what she told you to do; you tried never to show fear, or for that matter, love.

We did have two standards that may not have been totally distinctive but were not considered norms for similar social groups. One was that you never started a fight. Only "degenerates" did



that. Of course, you never backed down if one was forced on you, and you always fought to win. On the one occasion that Rich tried to start a fight, Bart punched him and all three of us carried Rich away. The second strong conviction was that we, as a group, never "jumped" anyone. Our belief again was that only degenerates fought four on one because they didn't have the guts to fight fair. Rich violated this group value once by jumping into a fight that a friend was losing. We pulled him out and, although we didn't punish him, we threatened to do so. With us it was a matter of honor.

### Roles, Status, and Leadership

*This subheading is appropriate to this social group, although the instructor has not used this precise terminology in the assignment. The student has created his own analytic structure rather than merely presenting a narrative about a group of friends.*

Much of the behavior of members of a group is defined and limited by the role of each member within the group. Although the roles of the members of our group changed somewhat over six years, we all had tacitly understood, if not articulated, roles.

Bart, for example, was generally regarded as the leader. He usually pioneered new fads or activities. His house was almost always the meeting place, and in the last three years of the group, he earned more money than anyone else. His position as host and money lender helped to keep him in an authoritative position with regard to our activities, our dress, and our interactions.

Sid was the "whipping boy," and, until near the end, Rich was the clown. We picked on Sid all of the time, but almost always in a kidding manner. For example, we teased him about everything from the size of his head to the way he pronounced his name. Rich, who always had a joke to tell, was the butt of our teasing when Sid was not around, but Rich gradually emerged from these minor roles because of his expertise with automobiles. As we all began to drive, we became dependent on Rich for the maintenance of our cars. To some degree his authority on cars carried over to other matters. We listened to Rich's opinions much more seriously at the end than at the beginning.

My role remained virtually unchanged for the

*Note the attempt to explore the relationships beyond casual observations and to organize them within categories instead of presenting them without a structure.*

years. Because I was acknowledged to be the smartest member of the group, I was the resident authority on intellectual matters and the person in whom the other members would confide if they wanted to discuss a matter that would not have been appropriate for full group discussion. We did not have many "intellectual" discussions as a group, but sometimes, in private, without fear of ridicule, individual members would talk seriously and candidly about something of interest to them.

Since I was the most aggressive and physically the largest group member, I was also considered the first to be called on in time of trouble. Once at a party we averted a physical confrontation with several troublemakers because of my actions. As Sid said, "I'm sure glad you were there." Since that incident the other members of the group have become more capable of defending themselves.

Overall, the pecking order of the group was: first, Bart; second, Ted; third, Rich; and fourth, Sid. In different areas, however, the status order was different. Below are rankings in several areas. Before writing this paper, I discussed these rankings with other group members.

#### Competition and Cooperation

*Attempt to provide theoretical context from reading for the rest of the section.*

Competition within a group occurs in order to acquire rewards—money, love, power—which exist in limited amounts. The only significant resource that existed in our group was leadership, for which the competition was sometimes intense. When we split, we split into two camps. One consisted

Table II  
Status Order for Group Members for  
Five Categories

Categories	First	Second	Third	Fourth
1. Meeting Girls	Bart	Ted	Rich	Sid
2. Mechanical ability	Rich	Bart	Sid	Ted
3. Physical ability	Ted	Rich	Bart	Sid
4. Finances	Bart	Sid	Rich	Ted
5. Intelligence	Ted	Bart	Rich	Sid

*This table illustrates points made in the text but expands the material covered to give more information than would be manageable in prose form.*

*Example to illustrate  
the concept of  
competition.*

of Bart and Sid, the other of Rich and me. It was within this arrangement that most of the conflict within the group took place, and, consequently, a good portion of the conflict took place between Bart and me, especially over the question of who would lead the whole group. This interaction involved trying to win over the lesser member of the other camp (Rich or Sid). The competition did not involve physical tests of any kind, but did take the form of verbal harassment. The most common expression was criticism of the other leader. Bart would say to Rich, "Why listen to him. He's such an ass." I would respond, "Sid, you must be pretty stupid to follow him; he doesn't know what he is doing." This sort of competition was almost continuous for the full six years.

*Student presents this  
information without  
emotional  
editorializing.*

Several times there were actual breaks within the group. Usually, however, these rifts lasted only for a day or two. Rich and I would go to a dance at St. Basil, and Bart and Sid would attend one at Father Judge. In general, Bart would control the group. I might wrest control for a few weeks, but then leadership would revert to Bart for months. During one period, Bart's control was so complete that I was, for a time, forced out altogether.

*Student draws  
inferences, does not  
merely list events.*

When Bart was in control, his domination over Sid was almost absolute. Sid followed Bart everywhere, regardless of whether or not Sid wanted to go. In contrast, Bart's authority over me was not very strong, and his control of Rich was somewhere in between. Rich could say yes or no. When I was in control, Rich followed me blindly, Sid shifted somewhat, and Bart acted pretty much as I did when Bart was in control.

*Example to illustrate  
cooperation.*

Overall, however, we showed a great deal of primary group cooperation, derived probably from our ethnocentric feelings for each other. Group cooperation was particularly evident when we dealt with other groups. In times of emergency, especially when we had trouble with others, we became very cohesive. An example was the occasion when the six members of a gang called C & A attacked Sid one night, apparently for no reason. We considered it our duty to retaliate, and the

next night we did. I went because Sid was part of our group, even though I never really liked Sid very much. It was "us against them."

### Social Control Techniques

*Paragraph designed to put this group into larger perspective of primary groups.*

Like all primary groups, we expected conformity to the norms of the group in dress, speech, social behavior, and values. And like all groups, we developed ways to enforce this conformity. The four ways we handled violations were sarcasm, gossip, physical punishment, and, as a last resort, ostracism.

*Student builds generalizations on solid detail.*

Of these, sarcasm and gossip were the more used and less severe. If, for example, a member got his hair cut too short, the others would make sarcastic remarks about his ears, the shape of his head, and so on. Gossip was used to correct behavior in such areas as girls and dealing with money. If a member was "hen-pecked" or "too tight" with his money, the others began to speak about these matters to each other until the offending party found out. This form of reprimand was usually effective.

Physical punishment was employed to correct continued violations of minor values or first-time violations of major values. If, for example, a member was still "too tight" with his money after the use of sarcasm and gossip, then he might be hit by one of the members of the group. If, as Rich did when he "ganged-up" on another person, a member violated an important norm, he might be physically roughed up or engaged in a full-scale fight. Usually, this form of correction occurred spontaneously, without any member passing judgment verbally or formally.

*Use of technical term, "ostracism," reinforced by explaining, in other words, the meaning of the term.*

Ostracism was the last resort in response to a member's deviant behavior. If any member knowingly violated one of the group's major norms and continued to do so, the other members simply stopped associating with him.

### Ethnocentrism

Our belief that our group was superior to others led, naturally, to ethnocentric feelings and behavior. The other groups were "fags" or

"degenerates." This feeling that we were the best caused us, several times, to turn down invitations to parties because there would be too many "fags" there or because we didn't want to associate with "degenerates." One notable ethnocentric reaction occurred after the four of us met and began dating, collectively, a group of four girls. After about two months these girls began to cool down the relationship and then rejected us in favor of four members of a gang that lived about seven blocks from us. None of us could understand how these girls could drop us for them. We were cool, and those guys were "smacks." We finally decided that the girls were "screwed up." Why else would they leave us for them?

*Concrete criteria for ethnocentric feelings.*

These feelings of superiority came out with regard to any other type of group, whether we distinguished ourselves from them by class, nationality, or size. We were superior to the lower class groups in Fishtown because they were "scum." We were better than the "degenerates" of South Philadelphia. The upper classes in Parkwood Manor were beneath us because they were "snobs." Larger groups of boys were inferior to us because it took more "guts" to go to dances with only four in a group instead of ten or twenty.

*Good attempt at analyzing reasons for the relationship.*

Of course, there were some groups that we considered almost equal to us, primarily because we were friendly with them. One particular group, known as Posalie Street, were definitely our equals. We went to dances with them; we partied with them; we even dated some of their female members. Many times we went down to Posalie Street to "hang around," and often they came to Bart's to do the same. They shared our values and our norms. The only reason that we did not become closer together, I suppose, was simple geography.

#### Conclusion

At the present time the group does not exist, nor is it likely to again. Bart and I grew away from Rich and Sid. In fact, Bart and I are now closer than ever, and I think it is because there is no longer a power struggle between us. In some

*In contrast to the direction of the paper so far, the student now introduces the shortcomings of the primary group. This conclusion builds upon and goes beyond the body of the paper.*

*Comparison of experience and theory continues to make the paper more than a simple narrative about one person's high school friends.*

ways I outgrew the primary group, especially as I increased my contacts with members of a secondary group, Beaver College students. It was with this new association that I first began to realize that my primary group was really not so great. And, although they are an "in-group" for me, college students are definitely an "out-group" for the other three, even for Bart, who still gives me a bad time about the new direction of my life.

Although I have outgrown my primary group, I can neither forget it nor diminish its influence on me. My primary group served an important function during my adolescence. It provided me with "intimate, personal, and total involvement in others' lives" (Horton and Hunt, 1976, p. 155). In some respects it is sad that the primary group no longer exists, for I sometimes miss the easy interaction and the casual teasing that was so much a part of it. However, its displacement by the secondary group of college classmates was inevitable, and this more impersonal and goal-oriented group is appropriate for me at this stage of my life.

#### References

Horton, P. B. and Hunt, C. L. Sociology.  
New York: McGraw-Hill, 1976.

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### Psychology 101-102: The Mama Rat project

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**Introduction** One of the major goals of this project is to show how the course of development follows an orderly sequence both in humans and other mammals. Another is to observe the behavior of mothers before birth and with their pups. You are probably more interested in children than in rats, but children develop much too slowly for the time we have available. Rats go through childhood in six weeks and are sexually adult in twelve weeks; the developmental process is short in time but is similar in many respects to that exhibited by humans. As you watch baby rats develop, you will

have experiences in making behavioral observations, relating those observations to theoretical principles, and writing a short paper describing your observations and conclusions.

The theoretical interest of the project lies in two areas. The first is that of "instinct," or species-characteristic behavior. Your instructor and your text will give you some background for the ideas you will be examining in this area. Maternal behavior is often given as an example of an instinct. You will have a chance to watch a rat mother preparing for the birth of her pups and caring for them. You will then be able to check what you see against the criteria for species-characteristic behavior in the readings.

The other area is development. You will have a chance to observe the orderly changes in appearance and behavior of the pups as they get older and check these observations against the principles of development described in your readings and in class. If you want to read further, your instructor can direct you to material on reserve in the library.

#### **Instructions for observations**

You will observe the external anatomy and behavior of several litters of rat pups from the time they are born until they are weaned about a month later. You will also observe the behavior of the mothers from their last few days of pregnancy until weaning. Pregnant rats usually build nests a few days prior to parturition. With luck, you may be present while a female is delivering.

You should observe the rats for fifteen minutes per day, three days a week for four weeks; i.e., 12 observation periods lasting a total of three hours. If all the rats are asleep, you will have to stay longer than fifteen minutes or come back at another time. The animals are located behind a one-way viewing screen in Room 108. Rats are most active during the night so we maintain them on a reversed light-dark cycle. Since they are relatively insensitive to red light, such illumination simulates their nighttime which begins at 8 AM and ends at 5 PM. Try to make all of your observations at about the same time each day. Do not turn on the lights in the observation room. You must allow a few minutes for your eyes to adapt to the very dim light in the room.

The most useful way to record your observations is to make a large table or chart on several pages of your notebook with columns for each category of behavior. An example of the format for such a chart is attached. During each period you should be sure to record descriptions of at least several of the items about mother or pups from the list in Table 1. The more information you record, the easier it will be to write your final paper. Date every observation so that you see a progression, and you know the milestones, such as birth, eyes opening, beginning walking, first eating solid food, weaning, etc.

It sometimes helps to discuss your observations with your roommate or someone else in the class to increase the precision of your descriptions. You may find that you did not notice some details. After talking with



SAMPLE CHART

<i>Date of observation</i>	<i>Mother's behavior</i>	<i>Pups: Physical development</i>	<i>Locomotion</i>	<i>Sensory development</i>	<i>Social behavior</i>	<i>Miscellaneous</i>
Sept. 11						
Sept. 13						
Sept. 15						
Sept. 18						

someone else, you may be able to record your next observation with greater specificity.

*Observation of mothers.* Your observation periods will be divided between watching the mothers and watching the pups. In observing the mothers, you will look for the following categories of observations as listed in Table 1: nest building, retrieving the young, grooming the young, grooming herself, nursing, sleeping, feeding, walking. The last four activities you will observe simply to see the postures and movements which are characteristic of an adult rat, so that you can compare adult activities to those of the pups. Watch the mother particularly for her interactions with the litter: nest building, retrieving, grooming, and nursing. You should see changes during the four weeks, because at the end of that period the litter will be weaned and could be living away from the mother.

When you observe grooming, for example, record in as much detail as you can exactly how the mother does it. How does she hold the pups? Does she hold them differently at different ages? What parts of the body are involved? Is this grooming similar to her grooming of herself, of the pups' grooming of one another? When observing nursing, record details about time, postures, and methods of weaning. Be precise in all descriptions and set up your own subcategories. Look for changes over the four-week period. Table 2 presents examples of criteria for several categories.

*Observation of pups.* Spend two-thirds of each observation period observing the pups in any single cage. Observe the same cage during all 12 observation periods so that you may gain an appreciation of behavioral



TABLE 1  
Behavioral categories  
for description of  
mother rat and pups

1. *Mothers*
  - Nest building
  - Grooming self, grooming pups (especially anal licking)
  - Exploration
  - Nursing
  - Retrieving
  - Rejecting pups at weaning
  - Walking
  - Feeding
2. *Pups*
  - Sleeping (solitary, social)
  - Feeding
    - Suckling
    - Solid food—eating behavior
    - Drinking
  - Locomotion: Stages include trunk movements or wiggling, twitching, freezing, sniffing, orienting, hopping, crawling with forepaws, righting movements, rising to erect position, walking, running, climbing, rising and swaying, jumping.
  - Sensory behavior: Describe indications of response to visual, auditory, odor, tactile cues.
  - Elimination: urination, defecation, anal licking
  - Vocalization: quality of sounds (if audible), stimuli to sound production
  - Grooming: face washing, licking, scratching (which paws, location of area scratched)
  - Exploration: sniffing objects, making lateral head movements, digging in nesting materials
  - Social behavior: Describe at each stage.
    - huddling, mutual sleeping postures
    - fighting over nursing position
    - general social activity such as running, jumping, chasing, wrestling, mutual grooming
    - fighting, including description of posture, length of encounter, acting of “victor” and “loser”
    - pseudo-sexual behavior, sniffing and licking of genitals, mounting

Stages of growth and physical development should be outlined on the basis of exact descriptions of skin (later fur), appearance of coloration, apparent length and weight, time of opening of eyes.

**TABLE 2**  
*Sample criteria for  
 behavioral categories*

- 
1. *Nest building*  
 Mother rat pushes bedding material with nose, holds it in forepaws, heaps it in corner of cage (how high? how tidy or regular? what proportion of the bedding materials in the cage is included in the heap?). Mother lies on heap creating a depression in the center. Mother works at edges of heap. Mother picks up her tail and carries it to nest.
  2. *Grooming self*  
 Mother lies on back, paws extended, licks and bites at fur (where?). Mother scratches at head behind ears with fore or rear paws (which?). Mother rubs against sides of cage. (Describe position of mother while she is licking as precisely as possible.)
  3. *Feeding behavior*  
 Mother lies on side, belly extended (describe position exactly). Pup struggles for position on mother's belly with wriggling movements of trunk, treading movements of forepaws. Pup holds on to nipple, engages in coordinated sucking movements and treading of forepaws. Pup struggles to maintain position, squeals if displaced by mother's movements or by other pups. (Time length of suckling for several pups.) Describe actions as pup disengages when it is sated.
- 

and anatomic development of rat pups. Table 1 provides a partial list of items to observe. For each item you must record in careful detail the components of each example of behavior. How do the rat pups sleep? In what position? How does walking develop? What parts of the body make what kinds of movements? Do the pups walk the way the mother does?

Be careful not to record your feelings or interpretation, but simply what you see. "The mother is taking time for herself," or "She hates her babies now that they are older," are *not* good observations. "Mother is sleeping on opposite side of cage from nest," or "Mother walks away from pups during nursing," are appropriate observations because they do not project human feelings onto the animals.

**Instructions for  
 paper**

Your paper has two components: (1) a chronological summary of your observations and (2) an interpretation or discussion of the important concepts demonstrated by your observations. Assume that your paper will be read by another member of the class who could not do the observations, but who has read the same material that you have.

*Summary.* In making your summary, first arrange all 12 observations of mother and of pups in order and read through them to see the chronology of feeding changes, or mobility, or grooming, or condition of nest,

etc. You are to summarize material both about the mothers and the pups. A summary requires the omission of some of your details and the selection of more important observations. If your 12 observation periods show a continuous, detailed picture of growth of only some of the categories of behavior listed in Table 1, then emphasize those and ignore others. You see that the quality of your summary is dependent upon the quality of your observations. A graphic or tabular summary of your observations is helpful to the reader. Remember there are many details to be read about and understood, so give the reader all the help you can.

In summarizing your observations remember that you are providing scientific data rather than a report on your own feelings. For example, even if you had a strong emotional reaction to seeing a mother rat give birth, you should not include a report of that in this paper. (You might want to write an entirely different kind of essay for your English class on your feelings of pity, terror, or sympathy as you watched a mother rat give birth.)

*Interpretation.* The purpose of this section of the paper is to link the observations you have described in part 1 with the theoretical ideas and concepts discussed in the readings and in class. In a sense you are telling the reader why it was worthwhile to have made these observations. You should take several of the theoretical concepts about trends in development or about species-specific behavior and look for data in your observations which would help explain or illustrate these concepts. One example might be the concept that motor behavior progresses from mass responses to specific or differentiated responses. Look at your observations. Can you find examples of mass responses (generalized twitching might be one)? Can you find examples of specific responses (handling solid food is one)? Now check the frequency with which mass responses and specific responses occur early in the pup's development, later in development. Does the concept fit your observations? Are there more mass responses early and more specific responses late?

You should do something like this for two or three other concepts. The more ably you relate observations to concepts the more you will understand how scientists are able to draw important conclusions from observational data.

*A few last words.* In your final draft, check your paper for spelling (especially psychological terms) and punctuation. Errors of spelling and punctuation give a poor first impression of your writing skills. If your paper received a first reading in English 100, 101, or 102, you should write an acknowledgment of this. The Beaver College Style Sheet describes the form for acknowledgments and references for psychology papers.

The quality of your paper will not be judged on its length. A good paper has richness of detail, a presentation that allows the reader to "see" through your observations, and a thoughtful interpretation linking concepts to your observations.

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## Mama Rat

Karen Sykie  
Psychology 101  
October 15, 1999  
Dr. Bernard Mausner

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### Acknowledgments

I want to thank my English 101 instructor, Professor Peggy Horodowich, for giving me an opportunity to work on drafts of this paper in the English 101 course, even though the finished paper was actually required in Psychology 101. Not only did she provide class time for peer group responses to my paper, but she conducted a lesson on the precise recording of observations. The whole class had a chance to see ways to make sense of a list of details.

I also want to thank my roommate, Elizabeth Czystczon, for looking at the baby rats with me, even though she said that they made her sick. She was the one who noticed the emergence of the dark spots on the rats' backs.

Finally, thanks to my boyfriend, Kenneth Fairness, for typing my paper.

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### Mama Rat

During a four-week period I observed the behavior of a laboratory rat mother and her litter. I began my observations on the day before the litter of eleven rat pups was born, and I observed the rats for fifteen minutes for four days of the first week, and three days during each of the next three weeks—thirteen observations in all.

*Student correctly assumes her audience is familiar with laboratory cages and does not describe them. She does explain observational context.*

Subheadings used  
throughout the paper  
for organization.

## Behavior of the Mother

### Nestbuilding

Precise detail in  
description.

During my first four days the Mama rat spent one-quarter of the observed time in nest building. She picked up pieces of the nesting material with her mouth and/or front feet, accepting some pieces and discarding others, and threw the selected particles on top of the nest. The nest was a large pile with a center indentation made by the litter, but because the nesting material was soft, the pile became flattened by the movement of the litter. She spent less time rebuilding the nest during the second and third weeks, and she spent no time at all on the nest during the fourth week.

Student summarizes  
several weeks of  
observation in this  
sentence.

### Grooming herself and the pups

Precise details.

The mother groomed (cleaned) her head by licking her front feet and then running them along her face and nose. She chewed at her tail and licked her anal area. She stood on her hind legs and licked her stomach and nipples. She licked all the pups at the same time while they were lying in a huddle. She turned them over and moved them around with her front feet and licked other portions of their bodies including the anal areas.

### Nursing and weaning of the pups

These descriptions are  
free from student's  
emotional or value-  
laden judgments.

The mother nursed the pups continually during the first week, leaving the nest for only a few seconds at a time to scratch herself, or get food and water. Sometimes she chewed food while she was nursing the pups. She sat on top of the nest, and the pups nursed under her. Sometimes I could see a pup's leg protruding from the side of the mother's body. During the third week the pups would hang on the mother's nipples for a few seconds when she began to leave the nest. The pups would hang on and then fall into the nest as the mother walked on. During the third and fourth weeks, the mother gradually spent less time nursing the pups. In fact, during the fourth week, she pressed her body against the walls of the cage to prevent the young from nursing.

### Instinct

*Definition of instinct  
inserted in sentence.*

*Examples used to  
illustrate instinct.*

*Reasonable  
supposition by  
student.*

Instinctive behavior, that is, complex behavior which is specific to the species and appears in complete form without opportunity for learning or practice, characterizes most of the mother's behavior. She built and rebuilt the nest, starting before the pups were born; she ate the afterbirth; she groomed herself and the pups. This complex behavior was made up of many component movements and seemed to have a similar pattern each time I observed it. Since this litter was the first one for the mother, she could not have learned the behavior previously. As the weeks went on, the mother spent less time nursing, probably because the pups' needs and the mother's milk supply diminished.

### Development of the Pups

#### Physical characteristics

*Good description.*

*Appropriate use of "I."*

The pups' skin was pink and wrinkled at birth. Their heads were more than half the total size of their bodies, in contrast to the mother's head which was about one-seventh the size of her body. Their limbs were short and stubby. Their ears were flat against their heads, and their facial features were undefined. After a few days the skin color turned to a darker pink, and by the end of the first week darker patches were beginning to show on various places on their bodies. During the second week their heads were completely dark with dark spots clearly defined on their backs. The dark spots began to have fuzzy hair, while the undersides and limbs remained pink. By the end of the second week, the facial features, ears, and digits were clearly defined, and individual differences in the size of the pups began to show. The color differentiation of the pups was complete by the third week as the black and white hair grew longer. The eyes opened during the third week. I could not tell whether the pups' sense of smell was developed or not. Their bodies and limbs grew into better proportion with their heads, so by the end of four weeks they looked like smaller

versions of their mother, except for individual color differentiations.

#### Locomotion and motor skills

In the first days after their birth, the pups remained in a huddle and their bodies quivered and twitched. When one pup moved, a ripple of movement seemed to go through the mass of sleeping pups. Their major activity was nursing. When sucking at their mother, their front paws seemed engaged in a pumping action.

After a few days the pups were able to move a few inches by sliding along on their bellies and pushing with their hind feet and pulling with their front feet. By the second week the pups were able to lift their heads and upper bodies and were standing on their feet, although their bodies and limbs were shaky. Sometimes they would move several inches away from the litter. They could not yet see, so they may have gotten back by smell or possibly by sensing body heat. Sometimes they would be retrieved by their mother, who would pick the wanderer up in her mouth and return him to the nest after a thorough grooming.

The third week showed the greatest increase in the level of their activity. Their movements became more rapid and the pups were able to get up and walk away from the nest and return without assistance from the mother. The pups began putting their front feet up on the sides of the cage, and they were able to run about with quick, accurate movements. This substantial increase in locomotion occurred in the same week in which their eyes opened. Those two significant changes might be related genetically.

In the fourth week, the pups were running around the cage and hanging from the screen on the top of the cage. They seemed almost to hop or bounce when they moved. When a sudden noise or movement occurred, they would dart around. They were also capable of picking up things with their front feet and grooming themselves and their litter mates.

The development of the rat pups' physical characteristics and motor skills clearly

*The term "second week" rather than actual dates of events makes the paper easier to read.*

*Rich detail in description.*

*Linking of examples to general concepts.*

exemplified three trends in development: cephalocaudal, from head to tail; proximodistal, from near the trunk to far from the trunk; and mass-to-specific, increasing precision of movements. The rats were born with oversized heads and stubby bodies. Their first movements were with their heads and front legs. The cephalocaudal pattern, from head to tail, was exhibited as they began to use their back legs and could coordinate the movement of all four legs. The newborn rats had stubby bodies that appeared to be almost a single mass. But as the weeks went on, they developed more specific mobility in their limbs in the expected mass-to-specific pattern. Their developing skills in picking up food and other materials and holding these things while they ate exemplified their increased precision in specific movements. Their pattern of development was from the trunk to extremities in a proximodistal direction. Their increased skills in scratching and grooming were also examples of mass-to-specific and proximodistal development. All of these trends appeared simultaneously and overlapped.

*Paper balances description of mother's behavior and description of pups. Student might have drawn more connections between activities of mother and pups. Student could also have recorded additional details, but it's not possible to cover all topics thoroughly in a short paper.*

Most mammals, including humans, develop according to similar trends. Infant rats and human infants have heads larger than their bodies and the growth of muscles and nerves proceeds downward; their appendages grow and develop dexterity after the trunk itself has developed to some extent; as they grow, they gain increased precision in their movements. Infant rats and human infants are also very different in the specific ways that they exemplify these general growth patterns. Each species has its own individual characteristics that are species specific. The age at which eyes open, for example, is a species specific characteristic. The litter of rat pups that I observed demonstrated these distinctive features as well as general trends of growth.



### **Biology 137 (animal behavior): Scientific review paper**

Each student will research and write a review paper. The purpose of the paper is to summarize the present state of investigation in a well-defined area of scientific interest and on a topic of on-going research.

Please select and define a topic, which must be approved by me. Find at least 8 to 10 research materials (papers, articles, books) on the topic and, in your own words, synthesize the research into a review paper. You should write your review so that a classmate in Biology 137 can understand the existing research situation on your topic. Your audience is composed of your classmates who are interested in science but who are not familiar with your topic.

This paper must be submitted in draft stages: (1) topic; (2) preliminary reference list; (3) draft for peer review; (4) finished draft, 8 to 12 pages, typed, double-spaced, with citations and reference list.

See the syllabus for due dates.

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#### **THE STATE OF RESEARCH ON THE "SONGS" OF THE HUMPBACK WHALE**

Gillian Morton  
Biology 137  
April 28, 1999  
Dr. Myra Jacobsohn

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#### **Acknowledgments**

I want to thank my instructor, Professor Myra Jacobsohn, for her encouragement throughout this project. She helped me to see that even a confirmed literary type like me can become really interested in a scientific topic. I won't say that the humpbacks will ever replace the sirens, but I'm glad to know that song in some sense can be an appropriate subject for a biology course. I also want to thank the students in my peer review

group, Barbara Kearney, Masha Lande, and Morton Apfelbaum, for their very helpful comments on my draft.

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## THE STATE OF RESEARCH ON THE "SONGS" OF THE HUMPBACK WHALE

*Introduction serves to identify the object of the study. It discusses characteristics that a science student would need as a context for reading the essay. Notice that the description is not evaluative, for example, the student does not say, "the humpback whale is a beautiful animal."*

Whales, like all members of the order Cetacea, are warm-blooded marine mammals. They breathe with lungs and give live birth to offspring, which they nurse. These characteristics make Cetaceans unique among sea animals and worthy of being studied more in the manner that we study primates rather than in the way we study fish. Like dolphins, Cetaceans on which extensive research has been done (Cousteau & Diolé, 1975; Lilly, 1975), whales are known to be capable of performing sophisticated mental functions (Cousteau & Diolé, 1975).

One whale which has intrigued researchers for nearly three decades is the humpback. Growing in length to nearly forty-five feet, the humpback is known for its giant, sculpted flippers which can grow to a third of the whale's total body length. Although found in all oceans of the world (McIntyre, 1974), the humpback population is concentrated primarily in the Antarctic Ocean. But even there they have never been plentiful. Perhaps once they numbered over thirty thousand, but the increase in whaling over the past forty years has reduced that number drastically (Payne & McVay, 1971). Even though the humpback has been overhunted in the northern hemisphere, small groups or herds gather in various areas of these waters to feed and give birth. The waters of Hawaii and Bermuda are most frequented. And it is in these areas that researchers have recorded their "songs" during their annual migrations.

### History of Recordings

*Subheadings are brief and descriptive, capitalized, and centered.*

Research into the songs of whales was not possible until the development of sonar in World War I. But the first serious research was not done until 1952 when O. W. Schreiber made extensive recordings off Oahu, Hawaii. W. E.

*History section provides the background for the research to be discussed.*

Schevill later recognized the sounds recorded by Schreiber as coming from humpback whales. The most impressive recordings were made near Bermuda by Frank Watlington, who collected his sounds by hydrophone. His equipment and fortunate location allowed him to record humpback sounds during their spring migrations (1953-1964), without the usual interference of shipboard and cable noises and without the fear that he was disturbing the whales by the presence of an observer (Payne & McVay, 1971). Roger and Mary Payne then continued where Watlington left off. They made several hundred hours of recordings off Bermuda during the spring from 1967 to 1971. More recently, Clark and Clark (1980) have begun research on whale behavior when the recordings are played back to them.

#### Source and Nature of the Songs

*These topics are neither technical nor controversial, so they are covered quickly and efficiently.*

Physically, the sounds of the humpback whales are produced entirely by shuttling air within their heads. That is, no air is expelled from the whale to produce the sounds (Miller, 1979). Consequently, the songs can be and are produced while the whales are submerged. For the most part, whales are alone and relatively inactive when they start to sing. When a few whales begin to gather, the first stops singing, but then the group begins to produce various unorganized mumbling sounds. Gradually, they all join in to form a rumbling chorus. Cousteau and Diolé (1972) consider this behavior analogous to orchestra members first tuning their instruments, then, all at once, striking up their piece of music. Once they are singing together, whales, like professional musicians, breathe in staggered sequences so that they will not interrupt the song.

#### Analysis of the Songs

*This is the main section of the paper.*

On first hearing the songs of the humpback whale, one gets the impression of an almost endless variety of sounds. However, sound spectrographic analysis reveals that all of these sounds occur in particular patterns and that

*Definition to establish validity of the use of the term, "song."*

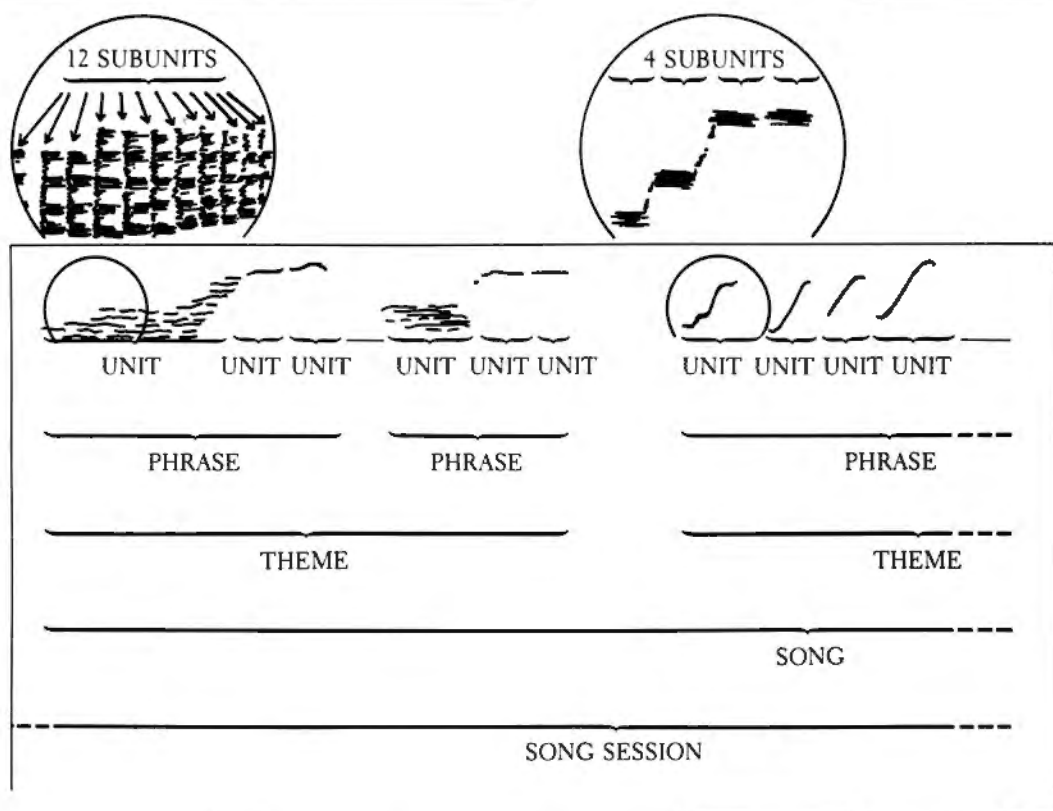
*Since this description is of a sequence, or pattern, it is useful to illustrate it visually.*

*Note that this discussion is a synthesis of others' research. The student does not attempt to make judgments or draw conclusions.*

every few minutes long sequences are accurately repeated (Payne & McVay, 1971). Since bird sounds are called "songs" because they consist of a fixed pattern of sounds, it is also correct to call the sounds made by the humpback, songs. Unlike the songs of birds, which are high-pitched and last for only a few seconds, the songs of the humpback vary in pitch and can last for up to thirty minutes. Interestingly, if a whale song is recorded and speeded up fourteen times the normal playback speed, it sounds amazingly like the song of a bird (Payne, 1979). Payne and McVay (1971), analyzing humpback songs, discovered and described the parts of the patterns of the songs. The shortest sound of the song is called a "unit." Some units, when analyzed at slower speeds, actually turned out to be a series of rapid pulses which Payne designated as "subunits." A series of units create a "phrase," and a continuous sequence of phrases is called a "theme." Several themes combine to form a song. A "song session," that is a series of songs, can last for hours. In summary, a subunit, a unit, a phrase, a theme, a song, a song session comprise the sound repertoire of the humpback whale.

Payne and McVay's studies (1971) reveal the fact that the humpback has a definite species-specific song pattern and that individual humpbacks vary their songs. By studying and analyzing scores of recordings and spectrograms, Payne discovered that all songs consist of three main sections: the first contains rapidly repeated pulses that vary in tone; the second consists of many short units of high frequency; and the last is made up of lower and longer notes that are repetitious both in rhythm and frequency. Payne believes that these three basic sections make up a general species-specific pattern for the humpback whale. Clark (1980), for example, discovered that right whales "talked back" to recordings of other right whales but swam away and made few responses to the songs of the humpback.

Despite the existence of a pattern among humpback whales, individual whales vary their songs. Payne noted that an individual whale,



*Most papers in the sciences and social sciences include graphic presentations of information.*

Fig. 1. This diagram represents a whale sound spectrogram which depicts the different parts that make up a whale song. The circled marks are enlargements of patterns from the diagram. (Payne & McVay, 1971)

repeating its own song, will change the song length. He recorded two successive songs of one whale. The first lasted seven minutes; the other continued for twelve and one-half minutes (Payne & McVay, 1971). The spectrograms of the recordings revealed that the variations in length were due to differences in the number of times that individual phrases were repeated within a theme. In other words, whales do not simply sing mechanically, but compose as they sing.

This ability of humpbacks to change their songs sets them off from other singing animals.

*Good transition.  
Student summarizes  
point she has  
developed in preceding  
paragraph and uses  
this point—the whales'  
ability to change their  
songs—as the subject  
of the first sentence of  
the next paragraph.*

Only man shares this complex behavior with the humpback. The Paynes, after twenty years of studying recordings, have discovered that the humpbacks not only vary individual songs, but change their song over a period of years (Payne, 1979). But, regardless of how frequent or complex the changes are, each whale apparently learns them. The recordings show that the "new" song, with the variations on it, is the only song sung each year.

### "Composing" the Songs

*Discussion of research  
method when  
necessary to show how  
a conclusion was  
drawn.*

Payne's research (1979) indicates that the musical talent of the humpbacks may be inherited. Payne compared the songs of humpbacks from Hawaii for a four-year period with those of the Bermuda whales for the same four years. He discovered that the two whale populations, which certainly had not been in contact, had the same song structure and functioned according to the same kinds of changes. This finding strongly suggests that the whales inherit the songs and the ability to improvise upon them. Since the whales do not sing at their summer feeding grounds, Payne (1979) first believed that it was possible that the whales simply forgot the song between seasons and then from fragments of the old song improvised a new one each year. However, after further study of humpbacks off the island of Maui, Payne (1979) discovered that the whales had not forgotten the previous season's song, since they were singing it when they first returned to Maui. Only later in the season did the changes in the song begin to develop (Payne, 1979). Payne's conclusion was that during the time between breeding seasons, humpbacks keep the previous year's song, without change, in memory.

### Purpose of the Song

*Note the impersonal  
reporting style used  
throughout the paper.*

The actual function of the elaborate song still eludes scientists. Mrozek (1978) argues that the song may be a territorial proclamation, that it provides adequate spacing and prevents direct competition among males for females. Some researchers believe that the song may actually be

*Student does not take sides but presents different theories objectively.*

a love song. The best evidence for this theory is that the song is sung only in one season, suspected to be the breeding season, and is sung only by adults (Miller, 1979). Schevill (1964, as referred to by Payne & McVay, 1971) similarly argues that the song is related to pair formation. Humpback songs recorded near Puerto Rico were being sung in February, the beginning of the northward migration of the whales. This phenomenon suggests, according to Payne and McVay (1971), that the song, therefore, might serve as a flock call to hold together a loose cluster of individual whales.

### Conclusion

*The student concludes by discussing the implications of the research.*

It has taken years of research to find and identify a pattern of communication in the sounds of the humpback whales. Perhaps further research, especially into the timing and accompanying behavioral patterns, will establish the exact purposes of the songs. Findings in this area may also have implications for the study of the sounds of other animals which may communicate in patterns that we do not recognize. At a minimum, continued studies will make us more aware of the intelligence of the humpback and may contribute to its preservation.

*Note this reference to the introduction.*

### Reference List

*The quantity and nature of the sources for reference indicate a freshman/sophomore paper.*

- Clark, C. W., & Clark, J. M. Sound playback experiments with southern right whales. Science, 1980, 207, 663-664.
- Cousteau, J., & Diol  , P. The whale. New York: Doubleday, 1972.
- Cousteau, J., & Diol  , P. Dolphins. New York: Doubleday, 1975.
- Lilly, J. Lilly on dolphins. Garden City, N.Y.: Anchor Press, 1975.
- McIntyre, J. The mind in the waters. New York: Charles Scribners Sons, 1974.
- Miller, J. A whale of a song. Science News, 1979, 115, 26-27.

Mrozek, C. Giant nightingales of the deep.

Oceans, 1978, 11, 2-7.

Payne, R. Humpbacks: Their mysterious songs.

National Geographic, 1979, 156, 18-25.

Payne, R., & McVay, S. Sounds of the humpback whales. Science, 1971, 173, 585-597.

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