

AN ABSTRACT OF THE THESIS OF

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(name of student) (degree)

in PSYCHOLOGY presented on May 19, 1990
(major) (date)

Title: The Prevalence of Head Injury Among Community
College Students.

Abstract approved: Cooper B. Holmes

The present study investigated the prevalence of head injury among community college students. Five community colleges in four states were asked to participate in the study. The students were asked to respond to a questionnaire about head injuries. The questionnaire was specifically designed to measure the incidence of head-injury or prolonged periods of unconsciousness of 20 minutes or more.

A total of 835 questionnaires were collected and analyzed. Forty students (4.79%) indicated having sustained a medically diagnosed head-injury/illness. Eighty-nine students (10.66%) reported an unconscious episode of 20 minutes or longer. The remaining students, 706 (84.55%), reported no period of prolonged unconsciousness or head-injury/illness.

Analyses of variance were conducted to determine if there was a significant difference between the mean ages and GPAs of the three groups. The age factor was significant $F(2, 832) = 20.98, p < .001$. Tukey's (a) test was conducted

to measure where the significant differences existed. Significant differences of the age factor were found between the group of students who had a prolonged period of unconsciousness and the other two groups, which did not differ. The mean GPAs of the groups did not show significance. Descriptive statistics were also conducted on the data.

The results give support to the study by Holmes, Kixmiller, Minor, Thomas, and Wurtz (in press) of four year institutions. However, further analyses and replications of the present study are needed to accurately assess the needs of this particular group of individuals.

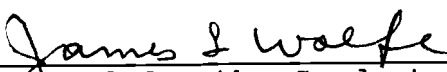
THE PREVALENCE OF HEAD INJURY AMONG
COMMUNITY COLLEGE STUDENTS

A Thesis
Presented to
The Division of Psychology
and Special Education
EMPORIA STATE UNIVERSITY

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Victoria Linn Buzzanga
May 1990


Approved for the Major Division


Approved for the Graduate Council

ACKNOWLEDGEMENTS

I have many people to thank. First of all, my deepest appreciation to the students and faculty of the community colleges who so graciously agreed to participate. Especially, Dr. David Neufeld (Hutchinson Community College), Dr. Phil Osborne (Hesston College), Dr. Larry Vandervert (Spokane Falls Community College), Dr. Linda Wickstra (St. Louis Community College at Florissant Valley), and Dr. Patrick Williams (Wharton County Community College).

During the past two years of my graduate studies, I have been privileged to be a student of Dr. Stephen F. Davis. Dr. Davis exemplifies the meaning of a true psychologist. He is dedicated not only to his work, family, personal hobbies, and students, he is able to keep all aspects of his life in amazing order. I am most grateful to him for believing in me when no one else would. He has taught me, and others before me, how to be a good student, teacher, professional, and perhaps most importantly a well rounded individual. I am forever in his debt.

Once in a lifetime a student encounters a teacher who will make an everlasting impact on his or her life. Fortunately, I have met such an individual. He is my mentor and advisor, Dr. Cooper B. Holmes. I want to take this opportunity to express my heart-felt thanks for all of his encouragement and the extra time he has taken to help me in my pursuits. Knowing him, as I do, he will probably modestly say it was merely part of his job. Over the past

two years, I have found this remarkable academian to be kind, loving, considerate, straightforward, and genuine. I am very fortunate to have had him for a professor.

I want to thank my committee members Dr. Cooper B. Holmes, Dr. David Dungan, and Dr. Phil Wurtz for their careful consideration, insightful questions, and objectivity in helping to make this thesis project well written.

Special thanks is extended to the most important people in my life, my family. Thanks mom and dad for all of the times I did not get what I wanted. It has taught me the value of a hard working day and the goals which can be achieved if your priorities are kept intact.

Finally, my thesis is dedicated to my best friend, Michael Patrick Reynolds, who will become my husband June 30, 1990.

The greatest happiness in the world
is the conviction that we are
loved, loved for ourselves, or
rather, in spite of ourselves.

-Victor Hugo

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CHAPTER 1

Introduction

A review of the studies on head-injured college students reveals that interest in this group is growing. However, some of the information which has been obtained has lacked factual results (Begali, 1987; Holmes, 1988; National Head Injury Foundation, 1985). Little is known about the types of brain injury/disorders among this particular group, the number of head-injured students in college, their specific problems and reasons for withdrawal from college. A study was conducted by Holmes, Kixmiller, Minor, Thomas, and Wurtz (in press) to determine the prevalence of head injury in four-year colleges. The authors recommended further replication of the study as well as assessing head injury at two-year institutions. Therefore, investigations are needed to assess the number of students attending community colleges who may have suffered from a brain injury.

How many community college students have incurred a brain injury? Very little factual knowledge has been gathered regarding the prevalence of closed head-injury and the information that does exist is mere speculation (Holmes, 1988).

Literature Review

Hall and DePompei (1986) estimated that as many as 170,000 persons suffer from a head injury each year. The injuries result from events such as motor vehicle accidents, falling, a blow to the head, or abuse. The group incurring the highest number of head injuries are those individuals within the 15-26 year range. Of the 170,000, approximately 50,000 of the cases become comatose or unconscious. Another 75,000 suffer significant head injuries but do not become comatose. As we learn more about head injury, the number of persons who survive head trauma, fortunately, is rapidly increasing. With increased survival rates, there is a need for more rehabilitation services as well as knowledge to improve care in dealing with the individual's emotional, psychological, physical, and social readjustment to society.

Several types of problems that the head injured individual experiences are well documented (Hackler & Tobis, 1983). The most noticeable type of brain disorder is one with clear physical injury (such as a disfigurement). Individuals with no physical evidence of a past head injury may be overlooked in attributing a problem to head trauma. Motor and visual coordination may be poor. Psychosocially the individual can experience difficulty in the display of appropriate behaviors, he or she may be very emotional, irritable, depressed, have a poor self image and become overly dependent upon others. Therefore, forming social

relationships can be difficult. Learning and memory processes can be especially difficult for the individual. He or she may experience problems with logic and abstractions (Bauer & Titonis, 1987).

Rimel, Giordini, Barth, Boll, and Jane (1981) stated that eight million people report minor head injuries each year. Of this number, only 400,000 are hospitalized. Minor head injury can be defined in many ways ranging from a loss of consciousness, which may or may not require hospitalization, to lacerations of the face and scalp which do not seem to affect the brain. The number of individuals who are unconscious for brief periods of time and are not admitted to a hospital is unknown. The total number of people at risk for sequelae after head injury lies somewhere between the number of patients who are admitted to a hospital and the millions who suffer a minor head injury of unknown severity each year.

Since the largest group of individuals who suffer a head injury are those within the 15-26 year range, it would seem obvious that they also should be the group upon which research should be focused. Many of these individuals could possibly be applying to college or will currently be enrolled in college. Of this group, many of the students who have sustained a closed-head injury are unable to return to college or return but experience many difficulties because of the impairments due to the head trauma (Hall &

DePompei, 1986).

There is evidence that some individuals who suffer from a minor head injury may have long-term effects. Postmortem examinations of individuals who had suffered from a concussion at some time in their lives were found to have neuronal loss, although there was no indication of other brain damage (Rimel et al., 1981).

Ozer (1988) has proposed plans which are needed to help head-injured individuals readjust and become productive once again. A rehabilitation program must examine the individual's pre-injury abilities. For example, was the individual an above average student or a below average student? It is not feasible to ask a below average student to do above average work if he/she was never in that category in the first place. The program must examine the nature of the injury and the individual's disabilities. Does the individual have the necessary support systems such as family and friends? Are there community resources readily available to the individual. What type of goals and motivational levels does the student possess? Most importantly, the evaluation process must be ongoing due to the recovery rate after head injury which can continue for many months after the injury and at various rates. Thus, the program may need to readjust to fit the individual's needs as the healing process is ongoing.

Within the educational system, high schools have

developed materials and programs on head injury. However, this is not true of colleges. As Holmes (1988) pointed out, high schools and colleges are vastly different in terms of the amount of work expected, the material covered in college classes, the lack of formal structure, the greater amount of independence, and the increased pressure for better grades in college. It is unreasonable, then, to devise head injured programs for colleges based upon the guidelines developed by high schools.

A few community colleges have begun to address the needs of the head injured college student. Cook (1987), Cook and Knight (1987), and Cook, Knight, and Harrington (1986) have discussed the components of assessing the effects of brain injuries in community college students. Access to past school records is useful to estimate the student's pre-injury performance. Meeting with the student allows the administrator to observe the individual's personality and psychosocial characteristics. The interview with the student can be a valuable source of information. For example, how does that individual interact with others? Can the student control physical and aggressive impulses? In many instances the interview can provide information from family and friends who accompany the student to the interview.

Crovitz (1987) reported that in some instances students are subject to providing inaccurate information when

recalling actual events due to poor memory functioning. Thus, families and friends of head injured individuals can help determine the validity of recovered memories. The recovery process is dependent upon the brain injured individual, the goals of the student, the expertise of the assessment team, and the willingness of the student to cooperate.

The advantages of rehabilitation were discussed by Savage, Cohen, Fryer, and Harrington (1985). The foremost psychological advantage is that the student is provided cognitive and social rehabilitation services. Rehabilitation programs allow the student to get out of the hospital setting into one which provides an atmosphere of wellness and is more affordable than the hospital. Head injury rehabilitation programs on college campuses are set within the age appropriate limits of 18-35, which is designed to meet the specific needs of this group of individuals. Finally, the program allows the student to be more independent and self-sufficient.

Levin, Benton, and Grossman (1982) reported that rehabilitation which is received as soon as possible tends to provide the best results. The authors suggested there is a critical period for recovery and emphasized the importance of counseling and family support to help the individual cope with the sometimes frustrating rehabilitation process. Unresolved denial by family members and unrealistic

expectations of the student can lead to frustration, anger, and depression in the head injured individual. Successful recovery is marked by the individual's involvement in the program's facilities such as speech therapy, remedial reading, writing, math, and group activities. Becoming active in the vocational rehabilitation process and open communication with family members and friends helps to facilitate the student's recovery.

Holmes et al. (in press) indicated a need to establish the actual numbers of head injured students, the students' concerns, and how both rehabilitation centers and colleges can be of assistance in their recovery and continued productivity. Holmes et al. (in press) conducted a study to assess the prevalence of head injury among students attending four-year institutions. The results indicated that approximately 4.37% of the students sampled had suffered a head injury and 5.22% of the total students had experienced a prolonged period of unconsciousness of 20 minutes or longer. The authors recommended that further investigations be implemented to replicate the study as well as to assess the prevalence of head injury at the community college level. The present study was designed to determine how many, if any, community college students have sustained a head injury or prolonged period of unconsciousness. The results can then be implemented to facilitate both further study of the topic and assistance to the community college

population if the need exists.

CHAPTER 2

Method

Sample

This study selected a sample of men and women community college students of all ages from four states: Kansas, Washington, Texas, and Missouri to determine the prevalence of closed head injury among community college students. The community colleges were: Hesston College and Hutchinson Community College (Kansas), Spokane Falls Community College (Washington), Wharton Junior College (Texas) and St. Louis Community College at Florissant Valley (Missouri).

The subjects were selected on the basis of availability, without specific criteria except their attendance at a community college and their willingness to participate. The subjects were recruited from as many different classes as were available to accurately represent the school's population and academic disciplines.

Eight-hundred-fifty-six questionnaires were obtained. Of this number eighteen of the subjects refused to fill out the questionnaire and three had to be discarded due to obviously facetious answers.

Three-hundred-twenty men and 515 women participated in the study. The subjects ranged in age from 17-60 years. Over 60 different majors were represented in the sample. The classes from which the sample population came from included students enrolled in Introductory Psychology,

Developmental Psychology, Readiness for College Course, Remedial Reading, Introduction to Sociology, Communications I and II, Introduction to Business, American Government, Micro-Computers, Micro-Computer Applications, and Accounting I classes.

Materials

The questionnaire, the same one used in the Holmes et al. (in press) study, contained a brief section for demographic information: age, sex, classification, GPA, major, college attending and the class in which the student is currently filling out the questionnaire. The front side of the questionnaire asks specific questions regarding head injury/illness such as type of injury and classes which may be difficult for the student. The backside of the questionnaire asks questions regarding prolonged periods of unconsciousness and difficulties the student may experience (please refer to Appendix A for a copy of the questionnaire). The following instructions preceded the administrations of the questionnaire:

This is a survey about brain injuries and illnesses. Your participation is voluntary and your responses will be anonymous. I would appreciate your cooperation in completing this survey. If you have completed this survey in another class, please do not complete another one.

If any of the items on the form are not clear, please ask about them. Begin by filling out the top portion of the front page where you are asked to give information about yourself. As the instructions indicate, if you have had a brain injury or illness you will complete the rest of that page. If you have not had a brain injury or illness, you will complete the back of the page. In other words, you will only complete one side of the form after you have given the background information. When you have finished, please give the form to the instructor. Thank you for your time and participation.

Procedure

With the exception of St. Louis Community College at Florissant Valley, a cover letter, informed consent forms, questionnaires, instructions and a return envelope were mailed to the psychology professor at each institution who had agreed to distribute the questionnaires (the Missouri school specifically requested the researcher's presence during administration of the questionnaires). The subjects were given a brief introduction and an informed consent document (please refer to Appendix B for a copy of the informed consent document). Once they understood, read, signed, and returned the informed consent form, the

instructor of the class read the instructions verbatim and distributed the questionnaire. The questionnaire took approximately 10 minutes to complete. The questionnaires were collected once the subjects were finished. The subjects were thanked for their participation and assured of confidentiality.

CHAPTER 3

Results

Age and GPA were analyzed by analysis of variance and subsequent post-hoc tests. Descriptive statistics were used to report the other data.

The analysis of variance did not show a significant difference among the three groups for GPA, $F(2, 728) = .55$, $p > .05$. The analysis of variance summary for GPAs is presented in Table 1. The analysis of variance conducted on the mean ages was significant, $F(2, 832) = 20.98$, $p < .001$. Tukey's (a) test was conducted to determine where the specific significant differences were. The results indicated a significant difference between the mean age of students who had experienced a prolonged period of unconsciousness with the other two groups (which did not differ significantly). The summary of the analyses of age is presented in Table 2.

Table 1

ANOVA Summary Table for the GPA Factor

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
A (GPA)	.24	2	.12	.22	NS
Within	397.80	728	.55		
Total	398.04	730			

Table 2

ANOVA Summary Table for the Age Factor

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
A (Age)	2341.52	2	1170.76	20.98*	.001
within	46437.62	832	55.81		
Total	48779.14	834			

The group of students who reported a medically diagnosed head injury/illness and no head injury/illness or periods of unconsciousness tended to be the older students. The students who had experienced prolonged periods of unconsciousness tended to be younger. The younger group differed significantly from the other two groups.

The questionnaires were divided into three groups: Students who had not experienced a head injury/illness or period of unconsciousness, students who had been unconscious for twenty minutes or longer, and students who had sustained a head injury/illness. The most pertinent information regarding the results are presented in Table 3 below.

Table 3

Characteristics and Results of the Head-Injury Survey

Sample Size	No Injury	Unconscious	Head Injury
Total (\underline{n} = 835)	706	89	40
Men (\underline{n} = 320)	260	43	17
Women (\underline{n} = 515)	446	46	23
First Year	374	62	15
Second Year	332	27	25
Percent of Total Sample			
Men	31.14	5.15	2.04
Women	53.41	5.51	2.75
Combined	84.55	10.66	4.79
Percent of own Gender			
Men	83.44	13.44	5.31
Women	86.60	8.93	4.46
Mean Age	22.84	18.46	26.10
<u>SD</u>	6.84	11.97	3.85
Mean GPA	2.91	3.02	2.95
<u>SD</u>	.77	.46	.51

A more detailed presentation of the data is provided in these sections. The data are presented according to the injury status of the subjects, i.e., no injury, unconscious period, and diagnosed injury.

No Injury/No Period of Unconsciousness. Four-hundred-forty six women and 267 men reported not having sustained a head injury/illness or period of unconsciousness of 20 minutes or longer. The mean age of this group (both sexes) was 22.84 years ($SD = 6.84$). Over 26 different college majors were represented in this group. The two most frequently reported majors were business ($n = 81$) and nursing ($n = 57$). The mean GPA for this group was 2.91 ($SD = .77$). In terms of difficult classes, students in this category reported math ($n = 138$) and none ($n = 92$) as the two most frequent. Twenty-one other classes were also listed as difficult, ranging from physics to art history. These 706 students constituted 84.55% of the total sample. In terms of gender, 86.60% of the women and 83.44% of the men had not sustained a head injury or extensive period of unconsciousness.

Unconscious for at Least Twenty Minutes. Forty-six women (8.93% of all the women or 5.51% of the total sample) and 43 men (13.44% of all the men or 5.15% of the total sample) reported not having sustained a head injury/illness but

having a period of unconsciousness for at least twenty minutes. The mean age of this group (both sexes) was 18.46 (SD = 11.97). The mean GPA for the group was 3.02 (SD = .46). A total of 89 subjects comprised this group and represented 10.66% of the total sample. Over 19 different majors were represented in this category. The range of minutes of unconsciousness for this group ranged from 20 minutes to five days. The mean years since the unconscious episode was 9.32 (SD = 10.55) with a range from 0-40 years. The mean time unconscious was 86.03 minutes (SD = 4565.74). Sixteen students reported a second incidence of unconsciousness (17.98% of this total group). Excluding the one extreme score of 5 days, the mean time unconscious was 68.98 (SD = 326.86). Six students reported a third incidence of unconsciousness (6.74% of this group). No one reported more than three unconscious episodes in this category. None of the students in this group reported taking medications as a result of the period of unconsciousness. In terms of aftereffects, 81.25% of the sample reported no problems or aftereffects. Difficulty in concentration and memory was noted by 9.40% of the group and in each of the areas of reading related problems, lecture classes, and the need to take many breaks during a task, 3.12% of the students reported difficulty.

The two most difficult classes reported by this group were math (n = 17) and English (n = 8). Thirty students

reported not experiencing any problems. Nine other classes were noted as causing difficulty within this group.

The causes for the unconsciousness ranged from being hit on the head to no explanation for the unconscious episode. The two most reported causes were being hit on the head ($n = 16$) and car/motorcycle accidents ($n = 16$). Other causes include: instances of falling ($n = 10$), sports related ($n = 9$), passing out ($n = 6$), alcohol ($n = 4$), fever/convulsions ($n = 3$), uncertain ($n = 3$), seizure, concussion, drug overdose, diabetic reaction, suicide attempt, stabbing, drowning, trauma due to a burn, lack of oxygen from being locked in an ice chest, and an unknown reason ($n = 1$ for each).

Medically Diagnosed Head Injury/Illness. Forty students reported having had a medically diagnosed head injury (4.79% of the total sample). Twenty-three women (4.46% of all the women sampled or 2.79% of the total sample) and 17 men (5.31% of all the men sampled or 2.04% of the total sample) comprised this group. The mean age of the head injured group was 26.10 years (both sexes) ($SD = 3.85$). The mean GPA of this group was 2.95 ($SD = .51$). Of the total sample, seven subjects reported a second head injury and four subjects reported a third injury. The mean number of years since the injury was 11.43 ($SD = 8.16$) with a range from 0-29 years. Five subjects (12.50% of the head

injured group) reported taking medication for the injury at the time of the injury. However, no one reported taking medications presently for the injury. Fifteen percent reported taking analgesics for the injury such as Tylenol 3, 7.5% reported taking perscription drugs such as Tegretol and Darvocett, and 77.50% of the head injured group reported taking nothing for the injury. The mean time unconscious was 109.8 minutes ($SD = 2963.30$). The range of unconsciousness due to head injury/illness ranged from 20 minutes to three days.

The head injury group consisted of 15 different majors with nursing ($n = 12$) and business ($n = 7$) as the two predominant majors listed. The most difficult classes reported by this group included English ($n = 13$), and math ($n = 9$). Surprisingly, 37.50% of the sample reported having no problems as a result of the injury ($n = 15$). Nine other classes were also listed as difficult.

Causes for head injury include 25 (or 62.50%) reporting a concussion, 10 (or 25.00%) listing car/motorcycle accidents as the cause of the injury, 4 (or 10.00%) listing a sport related injury (namely boxing and football) as a cause for head injury, and 2 (or 5.00%) reporting seizures as a result of the head injury. There were two reports (or 5.00%) of brain illness in this sample. They were classified as psychomotor epilepsy.

Aftereffects or problems as a result of the head injury

included memory (20.00% of the head injured sample), concentration (20.00%), severe headaches (5.00%), reading related problems (5.00%), comprehension (5.00% of the sample), classes which required lecture or activities that required listening for long periods of time (2.50%) and putting thoughts in order (2.50%). Forty-percent did not report any aftereffects.

Obviously, there could be an overlap between the unconscious group and the head injury group in regard to the reports of concussion. As stated in the Holmes et al. (1988) study, not all medically diagnosed concussions have serious aftereffects and not all undiagnosed concussions are necessarily minor. Therefore, it is essential that we study these two groups in combination together.

Combined Head Injury and Unconscious Groups. The total percentage of women of the combined groups represents 8.26% of the total number of students sampled or 13.40% of all the women sampled. The total percentage of men of the combined groups represents 7.19% of the total number of students sampled or 18.75% of all the men sampled. Collapsing across gender, the combined group ($n = 129$) represents 15.45% of the total sample.

CHAPTER 4

Discussion

In order to obtain a picture of the actual numbers of students involved, the U.S. Department of Education's Digest of Educational Statistics will be employed (U.S. Department of Education, 1990). The figures here are purposefully rounded so as not to give an impression of exact numbers of students who may be having difficulty in college due to head injury or extended periods of unconsciousness. The estimates are based upon mere speculation. The total number of students enrolled in community colleges as of 1987 was approximately 4,770,000. By gender, men constituted 2,070,000 and women 2,700,000 of this total. Using the results of the present study, approximately 447,460 students attending community colleges would have been unconscious for a period of 20 minutes or longer. The number of students who sustained a head-injury/illness attending college would be approximately 995,800. In terms of gender, the number of men attending community colleges who had been unconscious for extended periods of time may be equal to 154,000 and those who had sustained a head-injury or illness may lie in the area of 1,014,700. In contrast, the number of women who had experienced periods of unconsciousness of twenty minutes or more would approximately be 302,350 and those who had experienced a head-injury/illness could possibly be as great as 981,800.

The study was conducted to provide some type of baseline to determine how many, if any, community college students had sustained a head injury/illness and/or had been unconscious for an extended period of time. Based upon the results of the study it may be assumed that head injury/illness as well as prolonged periods of unconsciousness is more than uncommon in community college students. The present study also provided a comparison to the Holmes et al. (1988) study of four year institutions and gives credence to those results.

It was interesting to note the large percentages of students with a diagnosed head injury/illness and those unconscious for long periods of time who did not report having any problems as a result of the injury or unconsciousness. It was also surprising the number of students who inquired if head injury/illness was the same as mental retardation, which lends support to the argument that little is known about this specific, distinct population of students.

Since the age factor was statistically significant in this study, it is important to address the findings. As reported previously, age differed significantly, meaning the group of students who had sustained a medically diagnosed head injury/illness tended to be older than those who had experienced prolonged periods of unconsciousness. Students who had not experienced a head injury/illness or prolonged

period of unconsciousness did not differ significantly from the head injured students. However, the students' performance, as measured by their GPAs, indicated that no significant differences seem to exist in the academic performance of the three categories of students. What this means is not exactly clear. However, some assumptions can be made. Perhaps those students who suffered from a medically diagnosed head injury/illness chose to stay out of school longer and not rush the hectic lifestyle that college often produces. The students who have experienced an unconscious episode of 20 minutes or longer may not perceive themselves as having any difficulties which they could attribute to the period of unconsciousness since there is no significant difference between the mean GPAs of the three groups. Therefore, they may begin college much earlier than their head-injured counterparts.

More studies are needed to give further support to the study of four year colleges as well as the present study. Some suggestions include: replication of the four year study, replication of the present study investigating both fall and spring semester students, follow up analysis of those students who drop out of college and their reasons for doing so, and finally, intensive studies on students who report head injury/illnesses and/or extended periods of unconsciousness so that we might assess their specific needs, interests, difficulties, and overall ability to

succeed in college. As put very aptly by one subject who reported problems with organizing thoughts, "I'm just not the same anymore".

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APPENDIX A
Questionnaire

Age _____ Sex _____ Classification _____ Major _____

Overall GPA _____ College _____ This Class _____

Have you ever had a medically diagnosed brain injury or disorder?

YES _____ (Please complete this side of the page.)

NO _____ (Please complete the other side of this page.) →

1. What was (is) it? Please give the type of problem, part(s) of the brain involved, the year of the diagnosis and the time unconscious (Other than from surgery). If more than one problem, list each one separately.

_____ Year _____ Time Unconscious _____
(other than anesthesia)

_____ Year _____ Time Unconscious _____
(other than anesthesia)

_____ Year _____ Time Unconscious _____
(other than anesthesia)

2. Please list any medications you take for the injury/disorder.

3. Are there any classes especially difficult for you? Please name them.

4. If you feel the injury or disorder has affected your college performance, please list the problems you feel are related to the injury/disorder.

1. Have you ever been unconscious (other than from anesthesia) for 20 minutes or more?

NO _____ Please name any classes that are especially difficult for you.

(You are finished).

YES _____ (Please continue)

How many times? _____

Cause _____ Time Unconscious _____ Year _____
(other than anesthesia)

Cause _____ Time Unconscious _____ Year _____
(other than anesthesia)

Cause _____ Time Unconscious _____ Year _____
(other than anesthesia)

Please name any classes that are especially difficult for you.

2. If you feel that the period(s) of unconsciousness has (have) affected your college performance, please list the problems you feel are related to the unconsciousness.

APPENDIX B
Consent Form

Consent Form

Carefully read the following statements and sign below if you are in agreement.

The purpose of the present study is to better understand the particular needs and interests of students who have had a past head injury and/or brain illness.

The time taken to fill out the questionnaire will be approximately 10 minutes. Your answers as well as any identifying data will remain confidential.

If for any reason during the session you feel uncomfortable, you may discontinue participation.

I have read and understand the preceding information and agree to participate in this study.

Signature of Subject/ Date

I, Victoria Linn Buzzanga, hereby submit this thesis/report to Emporia State University as partial fulfillment of the requirements for an advanced degree. I agree that the Library of the University may Make it available for use in accordance with its regulations governing materials of this type. I further agree that quoting, photocopying, or other reproduction of this document is allowed for private study, scholarship (including teaching) and research purposes of a nonprofit nature. No copying which involves potential financial gain will be allowed without written permission of the author.

Victoria Linn Buzzanga
Signature of the Author

May 10, 1990
Date

The Prevalence of Head Injury Among

Community College Students
Title of Thesis/Research Project

Jackie Lohert
Signature of Graduate Office Staff Member

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