

1989

# Sleep duration in college women with anorexic or bulimic eating behavior

Tonja Swanson Green  
*San Jose State University*

Follow this and additional works at: [http://scholarworks.sjsu.edu/etd\\_theses](http://scholarworks.sjsu.edu/etd_theses)

---

## Recommended Citation

Green, Tonja Swanson, "Sleep duration in college women with anorexic or bulimic eating behavior" (1989). *Master's Theses*. 3073.  
[http://scholarworks.sjsu.edu/etd\\_theses/3073](http://scholarworks.sjsu.edu/etd_theses/3073)

This Thesis is brought to you for free and open access by the Master's Theses and Graduate Research at SJSU ScholarWorks. It has been accepted for inclusion in Master's Theses by an authorized administrator of SJSU ScholarWorks. For more information, please contact [scholarworks@sjsu.edu](mailto:scholarworks@sjsu.edu).

## INFORMATION TO USERS

The most advanced technology has been used to photograph and reproduce this manuscript from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book. These are also available as one exposure on a standard 35mm slide or as a 17" x 23" black and white photographic print for an additional charge.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

# U·M·I

University Microfilms International  
A Bell & Howell Information Company  
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA  
313/761-4700 800/521-0600



**Order Number 1337807**

**Sleep duration in college women with anorexic or bulimic eating  
behavior**

**Green, Tonja Swanson, M.A.**

**San Jose State University, 1989**

**U·M·I**  
300 N. Zeeb Rd.  
Ann Arbor, MI 48106



SLEEP DURATION IN COLLEGE WOMEN  
WITH ANOREXIC OR BULIMIC EATING BEHAVIOR

A Thesis

Presented to

the Faculty of the Department of Psychology

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

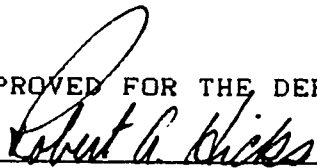
Master of Arts

by

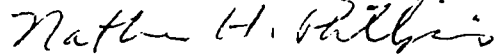
Tonja Swanson Green

May, 1989

APPROVED FOR THE DEPARTMENT OF PSYCHOLOGY



Robert A. Hicks, Ph.D (Chairperson)

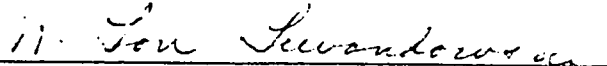


Ken Nishita, Ph.D



Robert Pellegrini, Ph.D

APPROVED FOR THE UNIVERSITY



## TABLE OF CONTENTS

SECTION	PAGE
INTRODUCTION.....	3
METHOD.....	5
Subjects.....	5
Variables.....	5
Procedure.....	7
RESULTS AND DISCUSSION.....	7
REFERENCES.....	14
APPENDICES.....	17
Appendix A. Consent Form.....	17
Appendix B. DSM-III-R Criteria.....	19
Appendix C. Sleep Habits Questionnaire.....	20
Appendix D. Eating Attitudes Test - 26.....	22
Appendix E. Minnesota Bulimia Screening.....	23



LIST OF TABLES

TABLE	PAGE
1. Means, and Standard Deviations for total sleep, EAT-26 scores and MBSQ scores.....	8
2. Summary of ANOVA used to measure the relationship between the three sleep groups & the EAT-26.....	9
3. Summary of ANOVA used to measure the relationship between the three sleep groups & the MBSQ.....	9
4. Chi-square contingency table for the relationship between the three sleep groups and the frequency of satisfied versus dissatisfied sleepers.....	12

Sleep Duration in College Women  
with Anorexic or Bulimic Eating Behavior

Tonja Swanson Green

San Jose State University

Running Head: RELATIONSHIP BETWEEN SLEEP AND EATING BEHAVIOR

Footnotes

Requests for reprints should be sent to Tonja S. Green,  
Department of Psychology, San Jose State University, San  
Jose, California 95192

## Abstract

Previous research has examined the relationship between abnormal eating patterns and sleep duration, demonstrating a greater tendency toward eating-related disorders in shorter sleepers (SS) compared to longer sleepers (LS). The present study replicated and extended the procedure used by Hicks and Rozette (1986) to assess whether certain eating disorder symptoms are related to specific sleeping habits and general satisfaction of sleep duration in college undergraduate women ( $N=243$ ). Two self-report questionnaires were used to survey anorectic (AN) type and bulimic (BN) type eating disorder related symptoms. Subjects were divided into three equal groups ( $n=81$ ) based on their responses to a sleep habits questionnaire. Analysis of these data revealed a significant inverse relationship between sleep duration and BN scores ( $F [2,240] = 3.63, p < .05$ ), and a non-significant relationship between sleep duration and AN scores. In elaborating these data, a significant difference ( $\chi^2 = 18.06, [2, N=243] p < .001$ ) between sleep groups and general satisfaction of sleep, showed that the frequency of dissatisfied sleepers in each group is systematically related to sleep duration.

Sleep Duration in College Women with  
Anorexic or Bulimic Eating Behavior

While a number of studies have measured the relationship between sleep and eating patterns in laboratory animals (e.g., Elomaa, 1981; Bowersox, Baker, & Dement, 1984) only a few studies have considered the specific interrelationships between sleep and eating in humans. Hicks, McTighe, and Juarez (1986) found decreased sleep duration was associated with disrupted eating patterns in their study on college students, a finding similar to that shown in laboratory animals (Elomaa & Johansson, 1980). In a subsequent study, Hicks and Rozette (1986) found that college students who were habitual shorter sleepers (i.e.,  $\leq 6$  hrs/night) were more likely to report anorectic-type symptoms such as those commonly reported by anorexia nervosa patients than habitual longer sleepers (i.e.,  $\geq 8$  hrs/night). They hypothesized that shorter sleepers (SS) may be partially deprived of rapid eye movement (REM) sleep and disruption of this sleep contributes to eating problems.

In support of these results are data from studies which measured EEG's of anorexia nervosa (AN) and bulimia nervosa (BN) patients. See Appendix A for DSM-III-R criteria (American Psychiatric Association, 1987). For example, Hudson, Pope, Jonas, Stakes, Grochocinski, Lipinski, &

Kupfer (1987), Walsh, Goetz, Roose, Fingerroth, & Glassman (1985), and Weilburg, Stakes, Brotman, & Herzog (1985), all have reported various REM disturbances of different severity in AN and BN patients. In addition, Viesselman and Roig (1985) documented longer sleep (LS) habits (specifically "hypersomnia and oversleeping") in their BN patients. In agreement with Hicks and Rozette (1986), Viesselman and Roig (1985) also reported that AN patients were chronic SS.

#### Statement of the Problem and the Purpose

The existing literature seemed inconclusive, so I chose to study the possibility that certain eating disorders might be related to specific sleeping habits in human beings. The purpose of this research was to replicate and extend the results of Hicks, et al. (1986) in a manner that investigated two specific types of eating disorder related symptoms and completed the sleep continuum by including a group of intermediate sleepers (IS). Therefore, two hypotheses were formed to examine these relationships in college undergraduates:

Hypothesis 1: SS would report more AN scores as measured by their responses to the Eating Attitudes Test - 26 (Garner, Olmstead, Bohr, & Garfinkel, 1982) compared to LS and IS groups.

Hypothesis 2: LS would report more BN scores as measured by

their responses to the Minnesota Bulimia Screening Questionnaire (Pyle, Halvorson, Neuman, & Mitchell, 1986) as compared to SS and IS groups

### Method

#### Subjects

The subjects were college undergraduate students (N=259) enrolled in an introductory psychology course who volunteered and gave their consent (see Appendix A) to participate in this study. Because the prevalence of AN and BN is much greater in females than in males, I surveyed only female students in an attempt to increase the sensitivity of my questionnaire design. Sixteen subjects who did not complete all items in the three questionnaires were eliminated from the survey. The remaining 243 were divided into three sleep duration groups (n=81-each group) and identified as SS, IS, or LS groups based upon their responses to the Sleep Habits Questionnaire.

#### Variables

A. Sleep Habits Questionnaire: Subjects completed the Sleep Habits Questionnaire used by Hicks et al. (1986). A copy of this questionnaire is given in Appendix C. Subjects were ordinally ranked (from most amount of sleep to least amount) based on the sum of hours slept per night and per day while napping. As was mentioned, the group was then

divided into subgroups. The upper one-third was designated as the LS Group (n=81, with  $\bar{M} = 8.06 \pm 0.58$  hrs/night), the middle one-third was designated as the IS Group (n=81, with  $\bar{M} = 6.92 \pm 0.18$  hrs/night), and the remaining third designated as the SS Group (n=81,  $M = 5.85 \pm 0.51$  hrs/night). Subjects also reported general satisfaction/dissatisfaction with their sleep duration.

B. Eating Attitudes Test (EAT-26): Subjects completed the 26-item abbreviated version of the Eating Attitudes Test (EAT-26) constructed by Garner, Olmstead, Bohr, & Garfinkel (1982). This is a self-report measure of the symptoms of AN whereby a cut-off score of 20, according to Garner and his colleagues, is the relative indicator of an individual's tendencies to report abnormal eating patterns. Carter and Moss (1985) concluded in their test-retest reliability of EAT that it is a reliable scale, but its validity when used as a screening device for clinical AN is questionable. Therefore, this test was used to determine the frequency of AN scores in SS, IS, and LS groups, and not as a diagnostic indicator of AN. A copy of this scale is included as Appendix D, along with the scoring criteria according to Garner & Garfinkel (1979).

C. Minnesota Bulimia Screening Questionnaire (MBSQ): This self-report questionnaire was refined by Pyle,

Halvorson, Neuman, & Mitchell (1986) from previous versions (Pyle, Mitchell, & Eckert, 1981; Pyle, Mitchell, Eckert, Halvorson, Neuman, & Goff, 1983) with the intent to confirm the DSM-IIIR inclusion criteria for BN. An abbreviated version was utilized to survey symptoms of BN behavior, specifically the components of binge-purge behavior. This same questionnaire has been used as a valid instrument in clinical populations. For this study a cutoff score of 25 was arbitrarily chosen to indicate subjects with BN-related symptoms. A copy of this questionnaire and scoring criteria is included as Appendix E.

#### Procedure

Prior to the start of the study, the subjects who wished to volunteer read and signed a consent form. Then they were instructed to answer all items in the test booklet to the best of their ability. After the group finished responding, the subjects were thanked for their participation, and were told that the final results of the study would be made available to them upon request. Finally the sleep groups were formed and their responses to the two eating disorder questionnaires were used to test the hypotheses of this study.

#### Results and Discussion

The means and standard deviations for the EAT-26 and



MBSQ for each sleep group are presented in Table 1.

Table 1

Means and Standard Deviations for Total Sleep, EAT-26 scores and MBSQ scores for each sleep duration group

Sleep Group	Variable		
	Sleep Length	EAT-26	MBSQ
SS	5.85 ± .51	10.28 ± 7.62	12.99 ± 7.83
IS	6.92 ± .18	8.36 ± 6.92	11.77 ± 8.21
LS	8.06 ± .58	8.59 ± 6.41	9.81 ± 6.53

To test the hypotheses of this study, the data summarized in Table 1 were used to compute two separate one-way ANOVAs. In one of these the effect of sleep durations on responses to the EAT-26 measuring AN scores was assessed. The results of this analysis are summarized in Table 2. In the other, the effect of sleep durations on responses to the MBSQ measuring BN scores was assessed. The results of the ANOVA are summarized in Table 3.

Table 2

Summary of ANOVA used to measure the relationship between the three sleep groups and scores on the EAT-26

	SS	df	MS	F	p
Between	178.87	2	89.44	1.83	n.s.
Within	11,758.63	240	48.99		
TOTAL	11,937.50	242			

Table 3

Summary of ANOVA used to measure the relationship between the three sleep groups and scores on the MBSQ

	SS	df	MS	F	p
Between	414.87	2	207.44	3.63	<.05
Within	13,705.76	240	57.11		
TOTAL	14,120.63	242			

Consistent with the results of an earlier study by Hicks and Rozette (1986), Hypothesis 1 predicted a significant inverse relationship between mean sleep duration

for the three groups and EAT-26 scores. As can be seen by inspecting Tables 1 and 3, this prediction apparently was not fulfilled. Specifically, while the SS group scored higher than the IS and LS groups as was predicted, the overall  $F$  computed from these data was not significant. Since this portion of the study was carried out as a replication of Hicks and Rozette's study, a brief discussion of this discrepancy is in order.

The Hicks and Rozette study compared the EAT-26 scores of two groups, i.e., habitual short-sleepers ( $\leq 6$  hrs/night) and longer-sleepers ( $\geq 8$  hrs/night). All of the subjects in both of these groups reported that they were satisfied with their sleep. When I tested the difference between EAT-26 means for my SS and LS groups, the results were nearly significant, i.e.,  $t_{[160]} = 1.52$ ,  $p < .07$ . Further, by examining the means and standard deviations for the total sleep of the SS and LS groups that are listed in Tale 1, it is clear that a sizeable portion of the subjects that met my criterion for SS (approximately 38%) and for LS (approximately 46%) would not have qualified as short- or longer-sleepers in the Hicks and Rozette study because they either slept too long or not long enough. Thus, with these differences in mind, it seems fair to conclude that these data replicate those reported by Hicks and Rozette in their study.

Hypothesis 2 predicted a significant direct relationship between mean sleep duration for the three groups and MBSQ scores. As is clearly shown by the pattern of the means listed in Table 1 and the summary of the one-way ANOVA computed to analyze these data, the results are significant but in the opposite direction from that predicted in Hypothesis 2. While these data are consistent with the view that attenuated REM sleep is related to eating problems (e.g., see Hicks, et al., 1986), it is inconsistent with Viesselman and Roig's (1985) conclusion that hypersomnia and oversleeping may be a factor in bulimia.

Perhaps the differences between my results and their conclusions can best be explained by considering the nature of their subjects and the design of their study. With respect to the former, 80% of their subjects were classified as depressed. It is well documented that a typical manifestation of depression is excessive sleep. It may be the case that the hypersomnia that they noted in these patients was not the cause of their bulimia but rather was a symptom of their depression. Further, since Viesselman and Roig failed to measure their subjects' sleep durations, it is difficult to draw any direct comparisons between their sample and mine. My data suggest that for normal variations in sleep, BN scores are more likely in shorter-sleepers.

Collectively the EAT-26 and MBSQ results suggest that habitually shortened-sleep is related in some general way to eating disorders. However, interpretation of this relationship is somewhat confounded by the fact that both satisfied and dissatisfied sleepers were used as subjects. As is shown in Table 4, the frequency of dissatisfied sleepers in each group is systematically (and significantly) related to sleep duration, i.e., Chi-square (2,  $N=243$ ) = 18.06,  $p < .001$ .

Table 4

Chi-square contingency table for the relationship between the three sleep groups and the frequency of satisfied versus dissatisfied sleepers.

	Sleep Groups		
	SS	IS	LS
Satisfied	15	24	40
Dissatisfied	66	57	41

When I tabulated the number of subjects in each sleep group that met the criteria for BN/AN (see chapter 2) a possible relationship between sleep dissatisfaction and these eating disorders was reinforced. Specifically, of

those subjects who were identified with AN/BN scores - 67% of LS (n=6), 75% of IS (n=12), and 86% of SS (n=14) were dissatisfied with sleep duration. This result is intriguing and should be the subject of future research.

Finally, I wish to note that while this experiment is limited by the underlying population, the criteria for the selection of subjects, and the validity of self-report measures used, it still seems fair to conclude that shorter sleepers show a greater tendency toward both types of eating-related disorders that may be facilitated by dissatisfaction with their length of sleep.

## References

- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd revised ed.). Washington, D.C., 65-69.
- Bowersox, S.S., Baker, T.L., & Dement, W.C. (1984). Rapid eye movement sleep and its relationship to feeding behavior in the adult cat. Physiology & Behavior, 32, 907-909.
- Carter, P.I., & Moss, R.A. (1985). Screening for anorexia and bulimia nervosa in a college population: Problems and limitations. Addictive Behaviors, 9, 417-419.
- Elomaa, E., & Johansson, G.G. (1980). Rapid eye movement stage of sleep participates in the generation of the nocturnal meal pattern in the rat. Physiology & Behavior, 24, 331-336.
- Elomaa, E. (1981). The light/dark difference in meal size in the laboratory rat on a standard diet is abolished during REM sleep deprivation. Physiology & Behavior, 26, 487-493.
- Garner, D.M., & Garfinkel, P.E. (1979). The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. Psychological Medicine, 9, 273-279.

- Garner, D.M., Olmstead, M.P., Bohr, Y., & Garfinkel, P.E. (1982). The Eating Attitudes Test: Psychometric features and clinical correlates. Psychological Medicine, 12, 871-878.
- Hicks, R.A., McTighe, S., & Juarez, M. (1986). Sleep duration and eating behaviors of college students. Perceptual and Motor Skills, 62, 25-26.
- Hicks, R.A., & Rozette, E. (1986). Habitual sleep duration and eating disorders in college students. Perceptual and Motor Skills, 62, 209-210.
- Hudson, J.I., Pope, H.G., Jonas, J.M., Stakes, J.W., Grochocinski, V., Lipinski, J.F., & Kupfer, D.J. (1987). Sleep EEG in bulimia. Biological Psychiatry, 22, 820-828.
- Pyle, R.L., Mitchell, J.E., & Eckert, E.D. (1981). Bulimia: A report of 34 cases. Journal of Clinical Psychiatry, 42, 60-64.
- Pyle, R.L., Mitchell, J.E., Eckert, E.D., Halvorson, P.A., Neuman, P.A., & Goff, G.M. (1983). The incidence of bulimia in freshman college students. International Journal of Eating Disorders, 2, 75-85.



- Pyle, R.L., Halvorson, P.A., Neuman, P.A., & Mitchell, J.E. (1986). The increasing prevalence of bulimia in freshman college students. International Journal of Eating Disorders, 5, 631-647.
- Viesselman, J.O., & Roig, M. (1985). Depression and suicidality in eating disorders. Journal of Clinical Psychiatry, 46, 118-124.
- Walsh, B.T., Goetz, R., Roose, S.P., Fingerhuth, S., & Glassman, A.H. (1985). EEG-monitored sleep in anorexia nervosa and bulimia. Biological Psychiatry, 20, 947-956.
- Weilburg, J.B., Stakes, J.W., Brotman, A., & Herzog, D. (1985). Sleep architecture in bulimia: A pilot study. Biological Psychiatry, 20, 199-228.

Appendix A

AGREEMENT TO PARTICIPATE IN RESEARCH AT SAN JOSE STATE UNIVERSITY

RESPONSIBLE INVESTIGATOR: Tonja S. Green

TITLE OF PROTOCOL: Sleep habits and eating patterns

I have been asked to participate in a research study that is investigating sleep habits and eating patterns. The results of this study should further our understanding of the relationship between sleep habits and eating patterns.

I understand that:

- 1) I am being asked to complete three questionnaires about my eating and sleeping behaviors which should take no longer than 30 to 60 minutes.
- 2) The possible risks of this study are minimal inasmuch as the nature of the questionnaires are not threatening to most individuals. Furthermore, I may decline to answer any, or as many, questions as I choose not to respond to, as well as refuse to participate or withdraw from this study at anytime.
- 3) The possible benefits of this study to me are minimal, however, in some cases I may benefit from the understanding I gain concerning the nature of my eating patterns and sleep habits. I may also benefit from the practical experience in participating in an organized research study.
- 4) The results from this study may be published, but any information from this study that can be identified with me will remain confidential and will be disclosed only with my permission or as required by law.
- 5) Any questions about my participation in this study will be answered by Tonja Green (408) 733-3603. Complaints about the procedures may be presented to Dr. Robert Hicks (408) 924-5659. For questions or complaints about research subject's rights, or in the event of research-related injury, contact Serena Stanford, Ph.D. (Associate Academic Vice President for Graduate Studies) at (408) 277-2943.

- 6) My consent is given voluntarily without being coerced; I may refuse to participate in this study or in any part of this study, and I may withdraw at any time, without prejudice to my relations with SJSU.
- 7) I have received a copy of this consent form for my file.

I HAVE MADE A DECISION WHETHER OR NOT TO PARTICIPATE. MY SIGNATURE INDICATES THAT I HAVE READ THE INFORMATION PROVIDED ABOVE AND THAT I HAVE DECIDED TO PARTICIPATE.

DATE \_\_\_\_\_ SUBJECT'S SIGNATURE \_\_\_\_\_

INVESTIGATOR'S SIGNATURE \_\_\_\_\_

PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

19,        Appendix B

20-21,    Appendix C

22,        Appendix D

23-25,    Appendix E

UMI

---