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Knowledge, Confidence, Intention, and Motivation: Hegemonic Masculinity's Influence Upon Nutritional Habits of Males

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KNOWLEDGE, CONFIDENCE, INTENTION, AND MOTIVATION:
HEGEMONIC MASCULINITY'S INFLUENCE UPON
NUTRITIONAL HABITS OF MALES

by

SARA CHIZMAR

A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Health Sciences
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Abstract

With the increasing incidence of chronic diseases such as Type 2 Diabetes Mellitus and cardiovascular disease and the growing obesity epidemic, the need to increase nutritional literacy amongst the general public is paramount. Men tend to lack a strong base of nutritional knowledge. Masculinity is one of the factors preventing many men from making good nutritional choices. The aim of this study was to investigate hegemonic masculinity in relation to current level of nutritional knowledge as well as perceptions and attitudes regarding dietary behaviors and intention to eat a healthy diet among a sample of males.

A convenience sample of males 18+ (n=87) was categorized according to hegemonic masculinity level by the Masculine Role Inventory. An amended survey gathered information regarding nutritional knowledge level. An original survey gathered information on confidence in one's nutritional knowledge, intention to eat healthier, and motivation to expand nutritional knowledge. Analyses examined the association between hegemonic masculinity and nutritional knowledge, confidence in nutritional knowledge, intention to change dietary behavior and motivation to learn new nutritional knowledge. No significant association was found between hegemonic masculinity level and nutritional knowledge, confidence, intention, or motivation. The null results can be attributed to the low hegemonic status of the majority of participants. Analyses also examined the relationship between actual nutritional knowledge and confidence in nutritional knowledge. A positive association between higher confidence level and greater nutrition knowledge was found to be significant, $p < 0.006$. A positive association between higher confidence level and higher levels of motivation to learn new nutritional information was also found to be significant, $p < 0.000$. The results of this study suggest that an increased level of confidence in nutritional knowledge may be necessary to encourage accumulation of new nutritional knowledge.

Key Words

Hegemonic Masculinity, Nutrition, Nutritional Knowledge, Confidence, Intention, Motivation

Dedication

To all the men in my life,
I hope to somehow leave a positive influence
and convince you to eat your vegetables.

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CHAPTER 1: INTRODUCTION

Statement of the Problem

The area of nutritional research is a growing public health field. Between 1985-2009, federal investments in nutritional research more than doubled (Kuchler & Toole, 2015). Despite the increase in research, public knowledge of adaptive dietary practices and application of these behaviors has not been sufficient. The risk of many of the leading causes of death, including heart disease, cerebrovascular diseases, diabetes mellitus, and hypertension, can be mediated by one's diet (Centers for Disease Control and Prevention, 2013).

Males suffer from a greater health disparity than women. In 2013, the life expectancy for females was 4.8 years longer than for males, and has remained at that length since 2010 (Xu, Murphy, Kochanek, & Bastian, 2016). Males also have higher age-adjusted death rates for 13 of the 15 leading causes of death (Xu, Murphy, Kochanek, & Bastian, 2016). In the case of four of these causes, the rates of disease are twice as high for males compared to females. Considering that health and wellness is dictated by lifestyle habits and dietary habits, the focusing of nutritional research on men specifically is justified.

Study Rationale

One of the goals of Healthy People 2020 is to “promote health and reduce chronic disease risk through the consumption of healthful diets and achievement and maintenance of healthy body weights” (US Department of Health and Human Services, 2014). A healthy diet assists with maintaining general health and promoting healthy weight (US Department of Health and Human Services, 2014). Proper nutrition aids in healthy weight management which in turn limits the number of risks factors individuals have for a plethora of chronic diseases.

This research increased the understanding of the decision-making process of men in regards to dietary choices. By understanding better how men think about nutrition, interventions can be designed to improve nutritional lifestyle habits in this population.

Specific Aims/Hypotheses

Specific Aim 1: To determine the level of association between nutritional knowledge and hegemonic masculinity.

H₁: Hegemonic masculinity will negatively associate with nutritional knowledge.

Specific Aim 2: To determine if there exists an association between confidence in nutritional knowledge and hegemonic masculinity.

H₂: Men with higher levels of hegemonic masculinity will have significantly different levels of confidence in nutritional knowledge than men with lower levels of hegemonic masculinity.

Specific Aim 3: To determine if there exists an association between hegemonic masculinity level and intention to change eating patterns to a healthier diet.

H₃: Men with higher levels of hegemonic masculinity will have significantly lower intention to eat a healthy diet.

Specific Aim 4: To determine if there exists an association between hegemonic masculinity and motivation to learn new nutritional information.

H₄: Men with higher levels of hegemonic masculinity will have significantly less motivation to learn new nutritional knowledge than men with lower levels of hegemonic masculinity.

Specific Aim 5: To determine if there exists an association between level of confidence in nutritional knowledge and actual nutritional knowledge.

H₅: Higher levels of confidence in nutritional knowledge will positively associate with higher levels of nutritional knowledge.

Human Subjects Concerns

The study aimed to maximize benefits and minimize risks. Benefits included the opportunity for participants to reflect on their nutritional knowledge and possibly be motivated to improve eating habits. These changes will have a positive impact on both their short-term and long-term health. This study will benefit the greater community by showing if there is a correlation between level of hegemonic masculinity and nutrition. Healthy dietary habits encourage long-term positive health status. There are no foreseeable risks associated with this study. At the completion of the surveys, participants were directed to resources that provided them with nutritional information. These resources will provide participants with a starting point to expand their nutritional knowledge if they so choose.

All procedures were approved by the University of Central Florida Institutional Review Board. Participants were fully informed as to the nature and extent of the research. Participants were made aware that there would be no penalization for withdrawing from the study. Time for reviewing the consent form was not limited in any way.

All data was kept confidential. The survey was administered in an anonymous online setting. Participant surveys were not linked to any personal data. No identifying information was collected. A study identification number was assigned to each participant. Only two individuals had access to the survey data. All results were reported in aggregate.

CHAPTER 2: REVIEW OF THE LITERATURE

Nutrition and Health

Dickson-Spillmann and Siegris (2010) found that consumers with lower nutritional knowledge consumed fewer healthy items and more unhealthy items. They further reported that many consumers have a poor understanding of what constitutes a balanced diet. Kolodinsky et al (2007) suggest that nutritional knowledge is positively associated with making healthier food choices. Individuals need to be informed of how to eat well at home, as well as when eating out. Bates et al (2009) investigated consumer knowledge of nutritional facts of away-from-home foods and found that many consumers lack knowledge of the caloric, sodium, and fat levels of unhealthy foods. With many people choosing to eat out more often, knowing how to make healthier choices away from home increases in importance. Furthermore, they found that when provided with information regarding the nutritional facts of foods, consumers chose the unhealthier food items less frequently. Even so, choice of food often reflects what individuals define as tasting good or as inexpensive rather than the nutrient contents (Levi, Chan, & Pence, 2006).

Fitzgerald and Spaccorotella (2009) highlight four factors that affect how food choices are made: community/institution, macro/public policy, intrapersonal, and interpersonal. Community and institutional factors encompass school food environment, food availability, socioeconomic characteristics, portion sizes and access. Macro and public policy factors include media advertisement, food pricing, and local, state and federal policies. Intrapersonal factors affecting food choices include preferences, perceptions, self-confidence, motivation, knowledge and skill. Interpersonal factors affecting food choices include food availability, time constraints,

social support and culture—including gender roles (Fitzgerald & Spaccorotella, 2009). Gender roles often revolve around expectations of what is “typical” but may not always reflect reality. One facet of the typical female gender role is to pay attention to food choices (Levi, Chan, & Pence, 2006). This can involve being mindful of the food that they themselves consume, as well as the foods they provide for others, such as family members. The fear of being ostracized because of perceived femininity may lead men to be less involved with food choices (Levi, Chan, & Pence, 2006).

Hegemonic Masculinity

Connell and Messerschmidt (2005) characterize hegemonic masculinity as the culturally dominant type of masculinity that influences men’s identities and behaviors. The hegemonic male ideal consists of traits such as being strong, aggressive, tough, independent, courageous, and invulnerable (Connell & Messerschmidt, 2005). As this is an ideal, it is arguably impossible for any man to completely fulfill or achieve hegemonic masculinity. Although, due to socialization and cultural pressures, many will aspire to achieve hegemonic status, viewing it as the ideal by which most men are held to by others and often themselves (Lyons, 2009). However, hegemonic masculinity is not always associated with beneficial traits in relation to physical and mental health. Gough (2006) describes hegemonic masculinity as representing attributes such as risk-taking, endurance of pain, and perceived invulnerability. Connell and Messerschmidt (2005) also state that the hegemonic male often engages in more toxic practices, including physical violence. Hegemonic masculinity subordinates femininity as well as other masculinities (Lyons, 2009). Ongoing research suggests that hegemonic masculinity can be understood as consisting of traits so that those identifying as male may have resources to achieve certain hegemonic traits

and not others, leading those with subordinated masculinities to hyper-emphasize accessible traits (e.g. working-class men and physicality).

Hegemonic masculinity is temporally and regionally specific. It is, however, inaccurate to say that men manifest only hegemonic masculinity because it overlaps with other structural categories and gendered traits and functions on a continuum. Scales have been produced to measure the traits of hegemonic masculinity. The Masculine Role Inventory (MRI) developed by William E. Snell tests qualities, such as restrained emotions, inhibition of affection, and obsession with success. The adherence to these qualities are indicative of one's masculinity disposition (Snell, 1986). The traits assessed by the MRI are representative of the level of hegemonic masculinity that characterizes an individual. The use of this questionnaire to measure the hegemonic level of an individual was therefore appropriate for this study.

Disparity of Nutritional Knowledge between Men and Women

Masculinity is a key element in regard to how men think about and act on health issues (Evans et al, 2011). The literature indicates that men have overall poorer nutritional habits because men tend to conform to gender stereotypes that feminize nutritional practices, leading to lower nutritional knowledge levels (Gough, 2007). For instance, Sellaeg and Chapman (2008) state that there are relationships between gender and specific foods. For example, meat, alcohol, and large portion sizes are associated with masculinity, whereas vegetables, fruit, and fish are associated with femininity. Nutritional education programs emphasize these "feminine" foods, and thus, men's usual diets are considered unhealthy. Gough (2007) reports that the media primarily uses hegemonic masculinity as the framework for describing diet as it relates to men. Men are described as being strong, independent, and not needing to care about diet. He states

that diet is continually construed as women-centered even when the health risks of the traditional “male diet” are acknowledged. Misra (2007) found that women have a broader nutritional knowledge base, as well as a better understanding of food labels, than do men. Levi, Chan, and Pence (2006) point out that women have a tendency to be more informed and involved with their food choices over men. In a study done by Bates et al (2009), men more so than women continued to choose to eat less healthful foods after being informed of the nutritional content of certain foods.

As persistent unhealthy food choices will affect the overall health of men, the factors that affect food decisions need to be distinguished in order to implement targeted interventions. Studies tend to have women as the majority of participants and some studies only include women. This could be the result of women finding it more socially acceptable than men to participate in studies concerning nutrition and food choice. For example, Kolodinsky et al (2007) had a sample of 136 females and 64 males, and Bates et al (2009) used a sample that was sixty percent female. Most studies concerned with the subject of nutrition focus on the differences between men and women instead of only on men specifically. The discrepancy between female and male knowledge indicates a need for a focus on men and nutrition. Within studies concerning only men and nutrition, most have focused on behavior and attitudes toward nutrition or they have focused on men’s avoidance of perceived femininity associated with being nutritionally conscious. In conducting such research it is helpful to ground it in a behavioral theory. The Theory of Planned Behavior is one such theory that has been used successfully to explain dietary behaviors and intention (McEachan et al, 2011, McDermott et al, 2015)

Theory of Planned Behavior

The Theory of Planned Behavior (TPB) is a cognitive theory developed by Icek Ajzen (1985, 1991) to explain and predict the connection between motivation and human behavior. The TPB was used as the theoretical framework for the original attitudes survey. The TPB holds that people form intentions which are the most important factor for predicting behavior (Katz, et al., 2014). These intentions are influenced by the individual's attitudes toward the behavior and how they perceive others' attitudes. The effect of others is known as the subjective norm. This effect includes the influence of the others' actions, perceived judgments, and significance of that other person to the individual in question. This model also accounts for a person's self-efficacy in its concept of behavioral control. Greater self-efficacy leads to greater confidence in one's ability to successfully eat healthily. One believes he or she has more control over their behavior. This self-efficacy should translate into behavioral outcomes.

The TPB was used as a guideline in constructing survey questions on the participants' attitudes about nutrition: their confidence in their nutritional knowledge, their intention to change their behavior, and their motivation to learn new information.

Purpose of this Research

This study focused on one specific characteristic pertaining to men: their level of hegemonic masculinity. This project intended to fill the gap where hegemonic masculinity is specifically applied to nutritional knowledge, confidence, intention, and motivation. The aim of this study was to look at the relationship between hegemonic masculinity and nutritional knowledge, between hegemonic masculinity and confidence in nutritional knowledge, between hegemonic masculinity and intention to change dietary behavior, between hegemonic

masculinity and motivation to learn about nutrition and finally between actual knowledge level and confidence in nutritional knowledge.

CHAPTER 3: METHODS

Study Design

A cross-sectional study design was employed to assess if attitudes about nutritional knowledge and actual level of nutritional knowledge were associated with hegemonic masculinity level in a population of males. Participants were categorized into five hegemonic masculinity groups according to their responses on the Masculine Role Inventory: high, medium-high, medium, medium-low, and low. Participants' nutritional knowledge was assessed using an amended questionnaire. Attitudes about nutrition and healthy eating were measured via an original survey. This questionnaire aimed to examine the confidence level of participants in their nutritional knowledge level, participants' intention to eat a healthier diet and motivation to increase nutritional knowledge.

Sampling

Participants were recruited using a convenience sampling technique during the 2016 spring semester via emails, word of mouth, and social media messages requesting males 18+ years of age to complete a questionnaire. Inclusionary criteria consisted of the participants identifying as male and being 18 years of age or older. Participants were excluded based on identifying as female or failing to complete large sections of the survey.

Participants were instructed that their participation was completely voluntary and all gathered information would be kept confidential. Appropriate informed consent was obtained prior to administration of the survey. Participants were provided with the contact information of the researchers if they wished to contact them with any questions or concerns. They were likewise provided with the procedure whereby they may contact the IRB with any concerns.

Of the original 117 participants, 14 were excluded due to female status. Further, 11 were excluded as these participants only completed the demographics portion of the survey. An additional five participants were excluded because they did not respond to the majority of survey questions. After exclusions, the final study population was 87 men aged 19 to 59.

Instrumentation

Development of Nutritional Knowledge Questionnaire

Participants' nutritional knowledge was assessed using an amended form of the General Nutrition Knowledge Questionnaire for Adults developed by Parmenter and Wardle (1999). The General Nutrition Knowledge Questionnaire for Adults was not used in its entirety because it was made for citizens residing in the United Kingdom and contained items not applicable to U.S. culture. The questionnaire was shortened and questions were included in this study's questionnaire based on key topics covered by the USDA MyPlate campaign. The questionnaire was twenty questions in length and each had a correct, factual answer (*See Appendix B*).

Psychometric Qualities for the Nutritional Knowledge Questionnaire

Parmenter and Wardle (1999) reported Cronbach's alpha scores that ranged from 0.7 to 0.97. A score of 0.7 or higher is acceptable. Test-retest reliability was assessed using Pearson's correlation and results ranged from 0.8-0.97 with an overall reliability of 0.98. Construct validity was assessed by comparing the scores of dietetic students to computer science students. Dietetic students scored consistently higher on all sections with a critical value of $p < 0.0001$.

Development of the Attitude Questionnaire

The attitude questionnaire was an original survey consisting of fifteen questions. This survey consisted of three composite variables: confidence, intention, and motivation (*See*

Appendix B). The survey items were developed with reference to the TPB. A panel of experts in the fields of nutrition and men’s health were consulted and gave approval for the items included.

The questions pertaining to confidence investigated the participants’ belief of their ability to eat healthy and of their confidence in their level of nutritional knowledge. The intention questions investigated the participant’s willingness to hypothetically change their diet. The survey also investigated different factors that may influence the participant’s food choices. The motivation questions asked specifically whether the participant would be willing to increase their nutritional knowledge.

The questions were answered on a scale of 0-10, where 0 indicated either strongly disagree or highly unlikely and 10 indicated either strongly agree or highly likely, depending on the question. For analysis, participants were grouped according to their confidence levels into three equal groups. Cutoff points for groups were determined a posteriori by dividing the data into 3 percentiles. Low confidence included scores 0-6.33. Medium confidence included scores 6.4-7.67. High confidence included scores 7.7-10.

Table 1: Group categorization scores for confidence

Level of Confidence	Score on Questionnaire
Low (1)	0-6.33
Medium (2)	6.4-7.67
High (3)	7.7-10

Masculine Role Inventory

The masculinity status of the participants was assessed using the MRI (Snell, 1997). The scale was composed of 30 questions and was scored using a five-point Likert scale, ranging from disagree, slightly disagree, neither agree nor disagree, slightly agree, to agree (Snell, 1996).

Masculinity scores for each participant were calculated with each option corresponding to a

score of one to five. In questions one through twenty-nine, “disagree” was scored as one and “agree” was scored as five. Question thirty was scored as five for “disagree” and one for “agree.” A minimum score (all disagree) was 34 and a maximum score (all agree) was 146.

For analysis, participants were grouped according to their hegemonic masculinity level into five equal groups. Five groups were used for masculinity as opposed to the three used for confidence because of the greater range of scores. The five groups allowed for a greater distinction between masculinity levels. Cutoff points for groups were determined a posteriori by dividing the data into 5 percentiles. Participants with scores 34-57 were considered to have low hegemonic tendencies. The second category, medium-low, included the scores 58-64. The third category, medium hegemonic tendencies, included the scores 65-75. The fourth category, medium-high, included the scores 76-89. Participants with scores 90-146 were considered to have high hegemonic tendencies.

Table 2: Group categorization scores for Masculinity

Level of Hegemonic Tendencies	Score on MRI
Low	34-57
Medium-Low	58-64
Medium	65-75
Medium-High	76-89
High	90-146

Psychometrics Properties for the Masculine Role Inventory

The MRI is an existing gold standard scale for assessing hegemonic masculinity. Data was obtained using this scale, and appropriate reliability and validity tests were performed on that data (Snell, 1986). Factor analysis was used to validate the constructs defined by the MRI. Reliability measures were obtained using data from three samples of participants. Cronbach’s alpha values were calculated to be 0.84, 0.88, and 0.78 for each composite variable.

Intercorrelation scores for each composite variable within the scale were calculated: r values of 0.41, 0.46, and 0.37, $p < 0.05$ for the first composite variable; r values of 0.35, 0.41, and 0.37, $p < 0.05$ for the second and r values of 0.49, 0.51, and 0.35, $p < 0.05$ for the third composite variable were calculated using the three samples of participants.

Questionnaire Implementation

The questionnaire began with a few demographics questions. The questionnaire was then organized into the three main sections explained above. The MRI was the first main section. The attitudes section followed the MRI. The final section was comprised of the nutritional knowledge questions. The attitudes section was administered prior to the nutritional knowledge section so that a truer representation of participant's confidence in nutritional knowledge level could be obtained. This research aimed to assess participant attitudes prior to any direct influence of assessing actual knowledge. It is likely that participants would have answered some of the attitude questions differently if they felt they answered more of the nutritional knowledge questions incorrectly or correctly than anticipated.

Data Management

Data was stored in SPSS. No names were tied to any data. SPSS was used for data management and statistical analysis. Data was cleaned to exclude any ineligible participants. Data was recoded from individual survey questions into composite variable scores.

Data from the MRI were summed together to create a total masculinity score for each participant. Item 30 on the questionnaire was scored inversely. Data was divided into five equal groups. Data for the total score was coded Masculinity_Score.

Data from the confidence, intention, and motivation composite variables were averaged for each participant. For confidence and motivation, all questions designated by the original survey were included in the average score. The intention variable only included two questions that more specifically measured intention to change dietary habits. Each average value was coded Confidence_Avg, Intention_Avg and Motivation_Avg, respectively. Participants were sorted by confidence scores and then divided into three equal groups for analysis purposes.

Nutritional knowledge was scored based on the factual answer for each question. The correct answer was coded as a 1 and incorrect responses were coded as a 0. Those scores were added together to get one composite score. This variable was coded as Total_Nutrition_Score.

Data Analysis

Univariate Analysis

This study collected a variety of descriptive statistics for several demographic characteristics, as well as for each of the following measured variables: hegemonic masculinity level, confidence, intention and motivation scores, and nutritional knowledge score. For each variable, mean, median and mode was calculated along with the variance, standard deviation, range and minimum and maximum values. Skew and kurtosis were evaluated for masculinity, confidence, intention, motivation, and nutritional knowledge, and data was divided into percentiles to form equal groups.

Bivariate Analysis

This research has a stated critical value (α) of 0.05. Any probability value equal or less than this value indicated statistical significance. The data produced by the nutritional knowledge and attitudes questionnaire was continuous. To determine whether parametric tests were

appropriate, the four assumptions were tested. The assumption of normality was violated for each variable evaluated, necessitating the use of nonparametric statistical testing.

All hypotheses were tested using an independent samples Kruskal-Wallis test. Participants were grouped according to masculinity level and then compared across groups by the dependent variable for each hypothesis. H₁ compared levels of nutritional knowledge between the masculinity groups. H₂ compared the mean level of confidence in nutritional knowledge for each level of masculinity. These tests indicated if hegemonic masculinity had an effect on nutritional levels or confidence levels. H₃ compared mean intention to change dietary behavior scores for each masculinity group. H₄ compared the mean motivation to learn new nutritional information score for each masculinity group. These tests indicated if hegemonic masculinity level affected intention to change dietary behavior or motivation to learn new nutritional knowledge. H₅ compared confidence in nutritional knowledge levels (high, medium or low) to actual levels of nutritional knowledge.

The independent samples Kruskal-Wallis test was chosen because it showed if there was a significant difference in means between two or more groups. As this test reports an aggregate p value, this study also ran a Games-Howell post hoc analysis to determine specific significance differences in means between all groups.

CHAPTER 4: RESULTS

Demographics

This study had a final sample size of 87 males aged 19 to 59. The mean age was 25.75 ± 8.021 years. The median age was 23. (See Table 3)

Table 3: Descriptive Statistics of Age of Participants

Statistics		
What is your age in years? (e.g. 18)		
N	Valid	80
	Missing	8
Mean		25.75
Median		23.00
Mode		21 ^a
Std. Deviation		8.021
Variance		64.342
Skewness		2.569
Std. Error of Skewness		.269
Kurtosis		6.875
Std. Error of Kurtosis		.532
Range		40
Minimum		19
Maximum		59
Percentiles	25	21.00
	50	23.00
	75	26.75

a. Multiple modes exist. The smallest value is shown

Table 4: Frequencies and Percentages of Age of Participants

What is your age in years? (e.g. 18)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19	2	2.3	2.5	2.5
	20	6	6.8	7.5	10.0
	21	15	17.0	18.8	28.7
	22	15	17.0	18.8	47.5
	23	8	9.1	10.0	57.5
	24	5	5.7	6.3	63.7
	25	6	6.8	7.5	71.3
	26	3	3.4	3.8	75.0
	27	2	2.3	2.5	77.5
	28	3	3.4	3.8	81.3
	29	1	1.1	1.3	82.5
	30	3	3.4	3.8	86.3
	31	1	1.1	1.3	87.5
	33	1	1.1	1.3	88.8
	34	1	1.1	1.3	90.0
	36	2	2.3	2.5	92.5
	40	1	1.1	1.3	93.8
	44	1	1.1	1.3	95.0
	45	1	1.1	1.3	96.3
	55	2	2.3	2.5	98.8
	59	1	1.1	1.3	100.0
	Total	80	90.9	100.0	
Missing	System	8	9.1		
Total		88	100.0		

The majority of participants identified as White/Caucasian representing 74.7% of participants. Asian/Pacific Islander constituted 3.4% of participants, Black/African American also constituted 3.4% of participants, and 18.4% identified as other. (See Table 5) A total of 24.1% of participants identified as Hispanic. (See Table 6)

Table 5: Ethnicity of Participants, Frequencies and Percentages

What ethnic background do you fall into below? (Select one)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Asian/Pacific Islander	3	3.4	3.4	3.4
	Black/African American	3	3.4	3.4	6.9
	White/Caucasian	65	73.9	74.7	81.6
	Other (Please specify below)	16	18.2	18.4	100.0
	Total	87	98.9	100.0	
Missing	System	1	1.1		
Total		88	100.0		

Table 6: Participants Identifying as Hispanic, Frequencies and Percentages

Do you consider yourself to be of Hispanic origin? (Select one)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	21	23.9	24.1	24.1
	No	66	75.0	75.9	100.0
	Total	87	98.9	100.0	
Missing	System	1	1.1		
Total		88	100.0		

Information was gathered regarding whether participants had previously taken a human nutrition course. Of the 87 participants, 35 (40.2%) had taken a nutrition course, and 52 (59.8%) had not previously taken a course. (See Table 7)

Table 7: Previous Human Nutrition Course, Frequencies and Percentages

Have you ever taken a human nutrition course? (Select one)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	35	39.8	40.2	40.2
	No	52	59.1	59.8	100.0
	Total	87	98.9	100.0	
Missing	System	1	1.1		
Total		88	100.0		

Nutritional Knowledge and Attitudes

Descriptive statistics were calculated for each variable examined. Hegemonic masculinity had a mean score of 72.2 ± 18.5 . The median score was 69. These scores fall into the medium category for masculinity scores. The range of scores was 37 to 144. (See Table 8) Confidence had a mean score of 6.9 ± 1.8 . The median score was 7. These scores fall into the medium category for confidence scores. The range of scores was from 3 to 10. Intention had a mean score of 7.8 ± 1.7 . The median score was 8. The range of scores was 3 to 10. Motivation had a mean score of 6.4 ± 2.2 . The median score was 6.7. The range of scores was 0 to 10. (See Table 9) Nutritional knowledge had a mean score of 8.5 ± 3.2 . The median score was 8. The range of scores was 0 to 16. (See Table 10)

Table 8: Descriptive Statistics for Hegemonic Masculinity Score

Statistics		
Masculinity_Score		
N	Valid	82
	Missing	5
Mean		72.2073
Median		69.0000
Mode		57.00 ^a
Std. Deviation		18.47570
Variance		341.352
Skewness		.893
Std. Error of Skewness		.266
Kurtosis		1.703
Std. Error of Kurtosis		.526
Range		107.00
Minimum		37.00
Maximum		144.00
Percentiles	20	57.6000
	40	64.0000
	60	75.0000
	80	89.0000

a. Multiple modes exist. The smallest value is shown

Table 9: Descriptive Statistics for Confidence, Intention, and Motivation

		Statistics		
		Confidence_avg	Intention_avg	Motivation_avg
N	Valid	85	87	85
	Missing	2	0	2
Mean		6.9373	7.8103	6.4431
Median		7.0000	8.0000	6.6667
Mode		7.33	9.00	7.00
Std. Deviation		1.84627	1.71898	2.15497
Variance		3.409	2.955	4.644
Skewness		-.276	-.726	-.429
Std. Error of Skewness		.261	.258	.261
Kurtosis		-.320	.080	.162
Std. Error of Kurtosis		.517	.511	.517
Range		7.00	7.00	10.00
Minimum		3.00	3.00	.00
Maximum		10.00	10.00	10.00
Percentiles	33.33333333	6.3333	7.0000	5.6667
	66.66666667	7.6667	9.0000	7.3333

Table 10: Descriptive Statistics for Nutritional Knowledge Score

		Statistics
		Total_Nutrition_Score
N	Valid	84
	Missing	4
Mean		8.4524
Median		8.0000
Mode		6.00
Std. Deviation		3.24280
Variance		10.516
Skewness		-.083
Std. Error of Skewness		.263
Kurtosis		-.077
Std. Error of Kurtosis		.520
Range		16.00
Minimum		.00
Maximum		16.00
Percentiles	33.33333333	7.0000
	66.66666667	10.0000

A Kruskal-Wallis test identified any mean differences in nutritional knowledge, confidence, intention, and motivation between hegemonic masculinity groups. No significant differences were found. (See Table 11)

Table 11: Results of Kruskal-Wallis Test for Masculinity Groups and Nutritional Knowledge, Confidence, Intention, and Motivation

Hypothesis Test Summary				
	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Total_Nutrition_Score is the same across categories of Masculinity_Equal_Groups.	Independent-Samples Kruskal-Wallis Test	.599	Retain the null hypothesis.
2	The distribution of Confidence_avg is the same across categories of Masculinity_Equal_Groups.	Independent-Samples Kruskal-Wallis Test	.945	Retain the null hypothesis.
3	The distribution of Intention_avg is the same across categories of Masculinity_Equal_Groups.	Independent-Samples Kruskal-Wallis Test	.129	Retain the null hypothesis.
4	The distribution of Motivation_avg is the same across categories of Masculinity_Equal_Groups.	Independent-Samples Kruskal-Wallis Test	.801	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

A Kruskal-Wallis test identified any mean differences in intention, nutritional knowledge, and motivation between confidence groups. (See Table 12) No significant differences were found between confidence groups and level of intention.

A significant difference in means was found between confidence level and nutritional knowledge score. A Games-Howell post hoc test indicated which groups differed significantly. (See Table 14) Significant differences in means only occurred between low (1) and high (3) confidence groups, $p < 0.013$. The mean knowledge score for the low confidence group was

7.1563. The mean knowledge score for the medium confidence group was 9.1600. The mean knowledge score for the high confidence group was 9.5600. (*See Table 13*) Thus, higher levels of confidence in nutritional knowledge associated positively with higher levels of nutritional knowledge.

A significant difference in means was found between confidence level and motivation. A Games-Howell post hoc test indicated which groups differed significantly. (*See Table 14*) Significant differences in means occurred between the low (1) and medium (2) confidence groups, $p < 0.000$. Significant differences in means also occurred between low (1) and high (3) confidence groups, $p < 0.000$. The mean motivation level for the low confidence group was 5.0808. The mean motivation level for the medium confidence group was 7.0128. The mean motivation level for the high confidence group was 7.8333. (*See Table 13*) Thus, higher levels of confidence in nutritional knowledge associated positively with higher levels of motivation to learn new nutritional information.

Table 12: Results of Kruskal-Wallis Test for Confidence Groups and Nutritional Knowledge, Intention, and Motivation

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Intention_avg is the same across categories of Confidence_Groups.	Independent-Samples Kruskal-Wallis Test	.096	Retain the null hypothesis.
2	The distribution of Motivation_avg is the same across categories of Confidence_Groups.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
3	The distribution of Total_Nutrition_Score is the same across categories of Confidence_Groups.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Table 133: Mean Values of Nutritional Knowledge, Intention, and Motivation by Confidence Groups

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Intention_avg	1.00	33	7.3788	1.68648	.29358	6.7808	7.9768	3.00	10.00
	2.00	26	7.7885	1.87709	.36813	7.0303	8.5466	3.50	10.00
	3.00	26	8.2885	1.55031	.30404	7.6623	8.9146	5.00	10.00
	Total	85	7.7824	1.72938	.18758	7.4093	8.1554	3.00	10.00
Motivation_avg	1.00	33	5.0808	1.85785	.32341	4.4220	5.7396	.00	8.33
	2.00	26	7.0128	1.62885	.31944	6.3549	7.6707	3.67	10.00
	3.00	24	7.8333	1.81779	.37105	7.0657	8.6009	2.67	10.00
	Total	83	6.4819	2.12052	.23276	6.0189	6.9450	.00	10.00
Total_Nutrition_Score	1.00	32	7.1563	2.78370	.49209	6.1526	8.1599	.00	13.00
	2.00	25	9.1600	3.37491	.67498	7.7669	10.5531	3.00	15.00
	3.00	25	9.5600	3.22852	.64570	8.2273	10.8927	.00	16.00
	Total	82	8.5000	3.25936	.35994	7.7838	9.2162	.00	16.00

Table 144: Games-Howell Post Hoc Results Comparing Means between Confidence Groups for Nutritional Knowledge, Intention, and Motivation

Multiple Comparisons

Games-Howell

Dependent Variable	(I) Confidence_Groups	(J) Confidence_Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intention_avg	1.00	2.00	-.40967	.47086	.661	-1.5464	.7271
		3.00	-.90967	.42265	.089	-1.9274	.1081
	2.00	1.00	.40967	.47086	.661	-.7271	1.5464
		3.00	-.50000	.47745	.551	-1.6545	.6545
	3.00	1.00	.90967	.42265	.089	-.1081	1.9274
		2.00	.50000	.47745	.551	-.6545	1.6545
Motivation_avg	1.00	2.00	-1.93201*	.45458	.000	-3.0263	-.8378
		3.00	-2.75253*	.49221	.000	-3.9412	-1.5639
	2.00	1.00	1.93201*	.45458	.000	.8378	3.0263
		3.00	-.82051	.48962	.225	-2.0060	.3650
	3.00	1.00	2.75253*	.49221	.000	1.5639	3.9412
		2.00	.82051	.48962	.225	-.3650	2.0060
Total_Nutrition_Score	1.00	2.00	-2.00375	.83532	.053	-4.0265	.0190
		3.00	-2.40375*	.81184	.013	-4.3678	-.4397
	2.00	1.00	2.00375	.83532	.053	-.0190	4.0265
		3.00	-.40000	.93409	.904	-2.6592	1.8592
	3.00	1.00	2.40375*	.81184	.013	.4397	4.3678
		2.00	.40000	.93409	.904	-1.8592	2.6592

*. The mean difference is significant at the 0.05 level.

CHAPTER 5: DISCUSSION

This study aimed to first determine the association between hegemonic masculinity and nutritional knowledge. The average masculinity score fell into the medium category. The most frequent masculinity scores were 57 and 64 which fall in the low and medium-low hegemonic categories, respectively. Participants largely exhibited low to medium levels of hegemonic masculinity. The scores included in the high hegemonic masculinity group had a wider range than the scores included in the other masculinity groups and included scores 90-146. The majority of participants within this group had scores between 90 and 108. Only one participant scored higher than 108, with a score of 144.

The mean nutrition knowledge score was 8.5 and the median score was 8. The most frequent score was 6. The total score possible for nutrition knowledge was 20. No participants answered all the questions correctly, and the highest score was 16. Overall, participants had low nutritional knowledge. This finding is consistent with the current literature that states that men tend to have lower levels of nutritional knowledge (Levi, Chan, & Pence, 2006; Gough & Conner, 2006; Misra, 2007).

The first hypothesis stated that hegemonic masculinity will negatively associate with nutritional knowledge. The results of the Kruskal-Wallis analysis indicated that there was no significant association between hegemonic masculinity and nutritional knowledge. The infrequency of the higher extreme of masculinity scores and the predominance of lower scores may have skewed results towards the null.

Gough (2007) and Sellaeg and Chapman (2008) both state that masculinity negatively affects nutritional knowledge levels among males. Previously, hegemonic masculinity

specifically had not been tested as a predictor for low nutritional knowledge. Despite the fact that no association was found to be significant, the results of this study do not suggest that the findings of previous research are incorrect. Evans et al (2011) discuss how hegemonic masculinity is an ideal strived for across the lifespan of a male and is an important factor in shaping men's health behaviors. The null result may have been due to the overall low knowledge scores across groups, reflecting a lack of knowledge in males despite differences in hegemonic masculinity level.

The second aim of this study was to determine the association between confidence in nutritional knowledge and hegemonic masculinity level. The hypothesis stated that men with higher levels of hegemonic masculinity would have significantly different levels of confidence in nutritional knowledge levels than men with lower levels of hegemonic masculinity. Participants had an average confidence score of 6.9. The median score was 7. The most frequent score was 7.33. Overall, participants were fairly confident in their nutritional knowledge level. The results of the Kruskal-Wallis analysis indicated that there was no significant association between hegemonic masculinity and confidence level. At all levels of hegemonic masculinity participants were fairly confident in their nutritional knowledge level. Courtenay, 2000 suggests that in regards to health-related beliefs men are supposed to be independent, self-reliant, strong, robust and tough. For men to have high confidence in their nutritional knowledge is an extension of those characteristics.

This study tested two additional hypotheses relating to hegemonic masculinity. The first stated that men with higher levels of hegemonic masculinity will have lower levels of intention to eat a healthy diet. Participants had an average intention score of 7.8. The median score was 8

and the most frequent score was 9. The high scores may be the result of the phrasing of the questions that assessed intention. The questions were phrased as though the request for a healthy change in diet was being asked by a doctor. Responses may have been different if the change in diet was self-directed or came from a non-authoritative figure. The other hypothesis stated that men with higher levels of hegemonic masculinity will have less motivation to learn new nutritional information. Participants had an average motivation score of 6.4. The median score was 6.7. The most frequent responses were 6, 8, and 10. Motivation to learn new nutritional information had the widest range of responses. The analysis found no significant association between hegemonic masculinity and either intention or motivation.

Expanding from connections between masculinity and nutritional knowledge, this research examined how confidence may be a determining factor in relation to nutritional knowledge. Confidence levels may be more closely tied to actual knowledge levels instead of masculine tendencies. This could help explain the lack of association between hegemonic masculinity level and confidence level. Specific Aim 5 sought to determine the association between confidence in nutritional knowledge and actual nutritional knowledge. The hypothesis stated higher levels of confidence in nutritional knowledge will positively associate with higher levels of nutritional knowledge. A significant difference in mean nutritional score was found between participants with high levels of confidence and participants with low levels of confidence. Table 13 shows that higher confidence levels were associated with higher nutritional knowledge. Britten (1996) investigated the association between elementary school teachers' confidence in their nutritional knowledge and their actual knowledge levels. She found that nutritional knowledge was a significant predictor of confidence. It is reasonable to expand her

findings beyond elementary school teachers and suggest that similar mechanisms affect the association between confidence in nutritional knowledge and actual nutritional knowledge in males.

No significant results were found by comparing participants' responses to the attitude questionnaire when they were grouped by masculinity status. Analysis was done to determine if any association exists if participants are grouped by confidence levels. No significant differences in intention to change dietary behavior were found when participants were grouped according to confidence. However, a significant difference in motivation to learn new nutritional information was found when participants were grouped according to confidence levels. Post hoc analysis indicated that the differences in mean motivational level existed between participants in the low confidence group and the medium confidence group, as well as between the low group and the high group. (*See Table 14*) The positive association between confidence and motivation level could be indicative of an overall positive attitude toward nutritional knowledge. Britten (1996) also investigated the association between confidence in nutritional information and time spent teaching nutrition in their classrooms. She found that higher confidence was the strongest predictor for the amount of time spent teaching nutrition. Thus confidence may be related to an openness to increase nutritional knowledge, whether it be to self or to others. This relationship should be expanded upon in future research.

Limitations

A convenience sampling method rather than a random sampling method was used. The majority of participants identified as White/Caucasian which may have influenced the results. The age range was very broad (40 years) which may also have influenced the results. Response

set bias may have occurred if participants answered questions in the way they thought the researchers expected. If the majority of data was missing from a participant's response, then the participant was excluded from the study population. However, some included participants were missing a limited amount of data, but not enough to warrant exclusion from the study, which may have biased the results.

The General Nutrition Knowledge Questionnaire for Adults is a gold standard questionnaire used for evaluating nutritional knowledge levels that was amended for use in this study. As this study questionnaire was amended, psychometric data reported by Parmenter and Wardle (1999) may not hold true for this study. No new values were obtained, and future research needs to reevaluate reliability and validity scores. For the original Attitudes Questionnaire, no psychometric qualities were evaluated. Future research needs to evaluate reliability and validity of the Attitudes Questionnaire, and verify the existing composite variables.

Future research should aim to sample a larger, more diverse group of males. A sample that includes more highly hegemonic males would be beneficial to better gauge if there is an association between hegemonic masculinity and nutritional knowledge and attitudes. A scale that specified several different types of masculinities would be useful to distinguish the association between different types of masculinities and nutritional knowledge. Studies investigating women who primarily embody masculine traits could also be included.

CHAPTER 6: CONCLUSIONS

The results of this study show no association between hegemonic masculinity and nutritional knowledge. Additionally, no association was found between hegemonic masculinity and confidence in nutrition knowledge, intention to eat a healthy diet, or motivation to learn new nutritional information. Results did show a positive correlation between confidence in nutritional knowledge levels and actual nutritional knowledge, as well as between confidence levels and motivation to learn new nutritional information. The present research is unable to definitively show if the higher knowledge caused the increase in confidence or if higher confidence allowed participants to answer more nutritional questions correctly.

This study warrants further investigation into the relationship between hegemonic masculinity and nutritional knowledge. Future research could measure hegemonic masculinity using a scale that focused on different aspects of the masculinity type to see if an association could be identified. Future research should further explore the relationship between confidence in nutritional knowledge and increasing nutritional knowledge as the association could be used to target males in an intervention study.

APPENDIX A: IRB APPROVAL LETTER



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1
FWA00000351, IRB00001138**

To: **Michael J. Rovito and Co-PI: Sara Chizmar**

Date: **February 18, 2016**

Dear Researcher:

On 02/18/2016, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination
Project Title: Knowledge, attitudes, and intention: Masculinity's influence upon nutritional habits of college males
Investigator: Michael J. Rovito
IRB Number: SBE-16-11998
Funding Agency:
Grant Title:
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the [Investigator Manual](#).

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Patricia Davis on 02/18/2016 05:13:35 PM EST

IRB Coordinator

**APPENDIX B: AMENDED NUTRITIONAL KNOWLEDGE AND
ORIGINAL ATTITUDE SURVEY**

Please answer each question to the best of your ability.

1. How many food groups are included in the USDA MyPlate Guidelines?
 - a. 3
 - b. 6
 - c. 5
 - d. 7
 - e. I don't know
 2. What are the food groups (If unsure, please write I don't know)?
-
3. How many servings of fruits and vegetables combined are you supposed to eat in a day?
 - a. 1-3
 - b. 3-6
 - c. 4-5
 - d. 5-7
 - e. I don't know
 4. What percentage of your total food intake should come from carbohydrate sources?
 - a. 40%-50%
 - b. 45%-65%
 - c. 60%-75%
 - d. 35%-55%
 - e. I don't know
 5. How many of your grain foods should come from whole grains?
 - a. Two thirds (67%)
 - b. One fourth (25%)
 - c. One fifth (20%)
 - d. Half (50%)
 - e. I don't know
 6. What is the recommended daily amount for water intake?
 - a. 16 cups
 - b. 6 cups
 - c. 20 cups
 - d. 4 cups
 - e. I don't know
 7. What factor(s) is the recommended daily protein intake dependent on
 - a. Body weight
 - b. Physical activity level
 - c. Sex
 - d. All of the above
 - e. I don't know
 8. Is fat a necessary part of a healthy diet?
 - a. Yes
 - b. No
 - c. I don't know

9. Which of the following is not a vitamin?
 - a. Vitamin A
 - b. Potassium
 - c. Niacin
 - d. Vitamin K
 - e. I don't know
10. Which fat do experts say is most important for people to cut down on?
 - a. Monounsaturated fat
 - b. Polyunsaturated fat
 - c. Saturated fat
 - d. I don't know
11. What version of dairy foods do experts say people should eat?
 - a. Full fat
 - b. Lower fat
 - c. Mixture of full fat and lower fat
 - d. Neither, dairy foods should be cut out
 - e. I don't know
12. Saturated fats are mainly found in:
 - a. Vegetable oils
 - b. Nuts
 - c. Meat products
 - d. Starchy vegetables such as potatoes
 - e. I don't know
13. There is the same amount of protein in a glass of whole milk than in a glass of skimmed milk.
 - a. True
 - b. False
 - c. I don't know
14. Which is NOT an antioxidant?
 - a. Vitamin A
 - b. Selenium
 - c. Vitamin D
 - d. Vitamin E
 - e. I don't know
15. It is bad to eat a lot of fruit because fruits contain a lot of sugar.
 - a. True
 - b. False
 - c. I don't know
16. It is more important to eat protein than carbohydrates.
 - a. True
 - b. False
 - c. I don't know

17. Which of the following is an example of a starchy food?
 - a. Peas
 - b. Bananas
 - c. Butter
 - d. Peanut butter
 - e. I don't know
18. What kind of bread contains the most nutrients?
 - a. White bread
 - b. Brown bread
 - c. Wholegrain bread
 - d. Multigrain bread
 - e. I don't know
19. Which one of the following has the most calories for the same weight?
 - a. Sugar
 - b. Starchy foods
 - c. Fiber
 - d. Fat
 - e. I don't know
20. Which would be the best choice for a low fat, high fiber snack?
 - a. Diet strawberry yogurt
 - b. A banana
 - c. Whole wheat crackers and cheddar cheese
 - d. Peanut butter on wholegrain toast
 - e. I don't know

On a scale of 0-10

Confidence

1. I am confident that I can eat a healthful diet.
2. I know a significant amount about eating healthy.
3. I can teach a friend how to eat a healthful diet.

Intention

4. If your doctor informed you that you needed to drastically change your diet due to health reasons how likely would you be to fully follow instructions?

5. If your doctor asked you to change your diet by adding another serving of fruit or vegetables each day how likely would you follow the recommendation?
6. I eat mostly based on what my friends eat.
7. I eat mostly based on how I grew up eating.
8. I need to pay attention to what I eat.
9. I eat based on what I think society accepts to be healthy foods.
10. I eat based on what researchers say is healthy foods.
11. I have the ability to make good food and beverage choices.
12. I have the ability to cook healthy foods.

Motivation

13. I would take a nutrition course even if it was not required for school or work.
14. I would change my diet if I learned I was eating poorly.
15. I would take a cooking class to learn how to make healthy food.

This concludes this survey. Thank you for your time and participation.

APPENDIX C: KEY TO NUTRITIONAL SURVEY

1. **C**

2. **Dairy, Protein, Fruits, Vegetables, Grains**

3. **D**

4. **B**

5. **D**

6. **A**

7. **D**

8. **A**

9. **B**

10. **C**

11. **B**

12. **C**

13. **B**

14. **C**

15. **B**

16. **B**

17. **A**

18. **C**

19. **D**

20. **C**

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