ROLE STRESS, EATING BEHAVIORS, AND OBESITY IN CLERGY

by

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Abstract

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by

Nancy N. Manister

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Purpose: This study, based on The Neuman Systems Model (Neuman, 2011) and Kahn and colleagues (1964) Organizational Role Theory, examined the relations between role stress, eating behaviors, and obesity in Lutheran Church Missouri Synod clergy.

Method: This was a randomized, cross sectional, web based study (N = 430), response rate 38%. Variables were measured by the Role Conflict and Ambiguity Scales (Rizzo, House, & Lirtzman, 1970); Emotional and Restrained Eating Behavior Scales of the Dutch Eating Behavior Questionnaire (Van Strien, Frijters, Bergers, & DeFares, 1986), and self-report of height and weight for BMI calculation.

Findings: Obesity was high (overweight/obese 81.4%, obese 36.7%). Emotional eating behavior partially mediates the relation between role stress and obesity (~ 77 – 78%), and restrained eating was not a mediator. In ancillary analysis, restrained eating was found to moderate the relation between emotional eating and obesity. Low social support was the most significant contributor to role stress ($r = -.41$, $p < .0001$), which was moderate.

Conclusions: Emotional eating partially mediates the relation between role stress and obesity. Restrained eating appears to moderate the relation between emotional eating and obesity. Future studies should examine the relation between role stress and the ability, rather than the intent, to restrain eating. Regarding Neuman's model, revisions to tests of relations between the normal line of defense and core response were proposed.

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Chapter I

The Research Objective

Nurses play an important role in the promotion of health within communities (Pender, Murdaugh, & Parsons, 2011). One strategy in this effort is to target the health promotion behaviors of community leaders who have high levels of influence over health behaviors of others. Clergy are important community leaders who have the potential to positively influence community health by including health topics in sermons, modeling positive health behaviors, and planning and advancing community health programs (Catanzaro, Meador, Koenig, Kuchibhatla, & Clipp, 2006; Hale & Bennett, 2003). Additionally, faith-based programs are effective in promoting health in various groups (Campbell et al., 2007; Cowart et al., 2010; Kaplan et al., 2009).

However, while clergy are good role models for some positive health behaviors such as seat belt use and not smoking or binge drinking, they are poor role models for healthy weight and physical activity levels (Berman, Bulka, Landes, & Woolf, 2005; Halaas, 2002; Proeschold-Bell & LeGrand, 2010). In fact, Carroll, McMillan, Price, and James (2001) reported that 75% of pastoral leaders (77.2% Protestant) described themselves as overweight or obese. Likewise, Proeschold-Bell and LeGrand (2010) reported that United Methodist Church (UMC) clergy in North Carolina were 10.3% more obese than the adult population of that state, and Halaas (2002) found that 65% of clergy from the Evangelical Lutheran Church of America (ELCA) reported weights in the overweight and obese range, and 34% reported weights in the obese range.

Though this may be related, in part, to the sedentary nature of their work, it may also be related to unhealthy eating behaviors resulting from attempts to cope with role

stress. Emotional eating (Konttinen, Männisto, Sarlio-Lähteenkorva, Silventoinen, & Haukkala, 2010; Slochower, Kaplan, & Mann, 1981), and unrestrained eating in restrained eaters (Elfhag & Morey, 2008; Wong, Wong, Wong, & Lee, 2009) are commonly identified as responses to increased stress. When stress is of a chronic nature, as is role stress, emotional and restrained eating behaviors may lead to obesity.

There is strong evidence that a career in ministry is stressful (Blanton, 1992; Francis, Louden, & Rutledge, 2004; Freedman, 1983; Ok, 2009), and of the many roles that a clergyperson may choose, such as administrator or missionary, the role of congregational clergy is particularly stressful based on unique role stressors. These stressors include lack of social support and sense of isolation (Verdieck, Shields, & Hoge, 1988; Virginia, 1998), workload and complexity (Gleason, 1977; Lee, 1994), boundary ambiguity (Meek et al., 2003; Proeschold-Bell et al., 2009), conflicts with congregations and denominational leaders (Hoge & Wenger, 2005), level of satisfaction with appointment (Kemery, 2006), perfectionism, goldfish bowl existence, and not having a clergyperson in whom to confide (Bleiberg, 1998; Gleason, 1977).

Kahn, Wolfe, Quinn, and Snoek (1964) propose that the experience of role stress, comprised of role conflict and role ambiguity, is dependent on an individual's appraisal of how "harmful" stressors are. Clergy's appraisal of stress may activate a variety of responses to stress. Much of the research on eating behaviors uses a behavioral rationale to describe stress induced changes in eating behaviors (Van Strien, Frijters, Bergers, & Defares, 1986). These include emotional eating behaviors that increase eating as an inappropriate response to distress (Konttinen et al., 2010; O'Connor, Jones, Conner, McMillan, & Ferguson, 2008; Slochower et al., 1981), and a counter-regulation process

in which stress undermines self-control over eating, resulting in unrestrained eating in restrained eaters (Elfhag & Morey, 2008; Polivy & Herman, 1976a; Wong et al., 2009).

The behavioral rationales for emotional and restrained eating behaviors are related to a recent hypothesis that describes the influence of neuroendocrine mediators as a biochemical rationale for changes in eating patterns. This hypothesis posits that when faced with uncontrollable stressors, the release of cortisol stimulates eating (Adam & Epel, 2007). Stressors that include a threat to one's social self-concept, chronic stressors, or demands that overwhelm coping abilities, such as role stress, activate the hypothalamus pituitary adrenal axis (HPA) and release of cortisol (Dickerson, Gruenwald, & Kemeny, 2004; Henry, 1997). Therefore, experienced role stress may induce over-eating, which when not counter regulated by under-eating or energy expenditure, results in weight gain, and ultimately obesity.

It was identified that clergy struggle with stress and obesity (Halaas, 2002; Proeschold-Bell & LeGrand, 2010). This study investigated the relations between role stress, eating behavior, and obesity in congregational clergy. Specifically, it was proposed that role stressors faced by clergy could result in role stress, and that, as a coping mechanism clergy change their eating behaviors, which may result in obesity.

The Problem

What are the relations among role stress, eating behaviors, and obesity in congregational clergy?

Definitions

Obesity. Obesity was conceptually defined as marked excess body fat. It was operationally defined as a body mass index (BMI) of ≥ 30 (National Heart Lung & Blood

Institute, 2008). BMI was calculated from self-report of height and weight using the formula: weight in pounds multiplied by 703, then divided by the patient's height (in inches) squared (Morrow, Jackson, Disch, & Mood, 2011). The resulting number approximates the BMI in kilograms per meter squared (kg/m^2). BMI was grouped as: underweight (≤ 18.5), normal ($18.6 \leq BMI \leq 24.99$), overweight ($25 \leq BMI \leq 29.99$), obese I ($30 \leq BMI \leq 34.99$), obese II ($35 \leq 39.99$), and obese III (≥ 40).

Role stress. Role stress was conceptually defined as experienced role conflict and role ambiguity. Role conflict is the perception that role expectations from various sources are conflicting and lack clarity and predictability. Role ambiguity is the lack of vital information needed for performance of a role (Kahn et al., 1964). Role stress was operationally defined as scores on the Role Conflict and Ambiguity Scales (RCAS) (Rizzo, House, & Lirtzman, 1970).

Eating behaviors. Eating behaviors were conceptually defined in this study as emotional and restrained eating behaviors. Emotional eating includes eating in response to both diffuse and clearly labeled emotions (Bruch, 1964; Slochower, 1987). Restrained eating is "the degree to which an individual eats less than he or she actually would like to eat" (Van Strien, Frijters, van Staveren, Defares, & Deurenberg, 1986, p. 747). These constructs were measured by the Dutch Eating Behaviour Questionnaire (DEBQ) (Van Strien, Frijters, Bergers, et al., 1986).

Delimitations

To date, studies concerning obesity in clergy are scarce and have focused primarily on Protestant clergy. This is most likely because, though most congregational clergy share almost identical role stressors (Bleiberg, 1998; Hoge & Wenger, 2005; Ok,

2009; Tomic, Tomic, & Evers, 2004), Protestant is the predominant religion in the US (51.3%), followed by Catholic (23.9%), Jewish (1.7%), and Mormon (1.7%) (Pew Forum on Religion and Public Life, 2007). Other faiths each represent < 1% of the population, and 16.1% are unaffiliated. In fact, only one study included non-Protestant clergy (Carroll et al., 2001) and in that study (N = 883), the sub-groups of Catholic clergy (n = 43) and "other religions" (n = 51) are too small to make valid comparisons. Moreover, these clergy obesity studies report that there is a problem with obesity but do not test hypotheses concerning factors that may contribute to a problem. In light of this paucity of research, and thus little knowledge about obesity prevalence in non-Protestant clergy, it was decided to limit the present study's sample to Protestant clergy.

Lutheran Church-Missouri Synod (LCMS) clergy, a group of over 6,000 Protestant clergy, was chosen as the referent clergy group in this study to further control for extraneous variance related to gender, marital status, education, and dietary restriction differences. Clergy in LCMS are a homogenous group of all males, who are predominantly married, have at least a master's degree, and have no dietary restrictions. Regarding gender, Proeschold-Bell and LeGrand (2010) report that female clergy have slightly lower overweight and obesity rates (range 2.5% to 11.4%), and there may be role stress differences related to gender. Females represent about 12% of clergy (Bureau of Labor Statistics, 2007), and though senior female and male clergy share the same role stressors, females are more often employed in non-senior roles (Zikmund, Lummis, & Chang, 1988), by smaller congregations, and experience greater congregational support than do male clergy (McDuff & Mueller, 1999).

Marital status may also influence role stress variance. Marriage may either increase role stress by adding to the complexity of the role (Hill, Darling, & Raimondi, 2003) or decrease role stress by providing support (Meek et al., 2003); therefore only data from married clergy was used. Likewise, education influences obesity with lower obesity rates found in those with a higher education (Centers for Disease Control and Prevention [CDC], 2010a) and there are varied advanced educational requirements for the ministry. Finally, dietary restrictions imposed by certain religions such as vegetarianism of Hindus and Seventh-Day Adventists, may influence eating behaviors (McCaffree, 2002). It should be noted however that non-whites have higher rates of obesity than whites (Flegal, Carroll, Ogden, & Curtin, 2010). Thus following recent work in this area (Proeschold-Bell & LeGrand, 2010), it was planned that data from non-White LCMS clergy would be compared with that of White LCMS clergy and if obesity rates were statistically different, then data from the two groups would be analyzed separately.

The choice of LCMS clergy further controlled for extraneous variance in experienced role stress related to the influence of beliefs. Specifically, Smith (1990) identified 154 Protestant denominations and classifies these along a continuum from fundamentalists to liberals. The differences between fundamental and liberal beliefs often set Protestant clergy apart, and interpretation of these concepts may be sources of conflict when clergy and/or parishioners fail to conform. Therefore, clergy's place on the fundamentalism-liberalism continuum is a potential source of role stress variance in clergy. LCMS clergy are moderates and thus this group was more likely to provide a balanced representation of clergy role stressors influenced by religious beliefs.

A final factor that was considered was the existence of an LCMS database and the ability to strengthen the generalizability of the findings through use of a truly randomized sample. As noted, LCMS clergy have a minimum of a master's degree and it was highly likely that all would have internet access. Therefore, this study's sample was limited to a randomized sample of LCMS congregational clergy who were married, current congregational clergy, and had computer and internet access with the ability to answer survey questions online. Additionally, clergy who had bariatric surgery, or had a history of anorexia or bulimia were excluded.

Theoretical Rationale

The Neuman Systems Model (NSM) (Neuman, 2011) provided a nursing conceptual framework and combined with Kahn and colleague's (1964) Organizational Role Theory, a grand theory, to explain how eating behaviors mediated the relation between role stress and obesity in clergy. Both described the potential for negative outcomes when persons are unable to effectively cope with experienced stress in their environments. Neuman views the person as a system depicted by a series of concentric circles called the flexible line of defense, normal line of defense, and lines of resistance that protect the person's basic structure, or central core from environmental stressors (see Appendix A). Each of these circles, as well as the core, is a composite of five interacting variables: physiological, psychological, sociocultural, developmental, and spiritual.

Environmental stressors are viewed by Neuman (2011) as inter-, intra-, and extra-personal tension-producing stimuli that have the potential for causing system instability. When faced with environmental stressors, the flexible line of defense can expand away from the normal line of defense providing greater protection, or contract closer, providing

less protection to the normal line of defense: the usual state of client wellness. If the normal line of defense is invaded by stressors, lines of resistance, which fall between the normal line of defense and the core, are activated to protect the core. Once activated, the lines of resistance can further protect system integrity by providing additional resources and preventing a core response. However, single or multiple stressors can reduce their effectiveness. The core response may affect any or all of the five person variables and may be operationalized as, "any number of severe consequences to the individual that happen as a result of exposure to stressors that place a strain on the system" (Günüsen, Üstün, & Gigliotti, 2009, p. 204).

Organizational role theory examines similar relationships within a work environment. Kahn et al. (1964) describes the environment as, "an open, dynamic system that is characterized by a continuing process of input, transformation, and output" (p. 12). Role expectations are sent to and interpreted by the person, and are intended as expectations or role pressures. However, when these expectations are viewed as overwhelming, role stress develops. Role stress is composed of both role conflict and role ambiguity. Role conflict develops when there exists "simultaneous occurrence of two (or more) sets of pressures such that compliance with one would make more difficult compliance with the other" (p. 19). Role ambiguity develops from a lack of information required by the focal person to adequately conform to the role expectations held by the members of his role set. This may be as simple as not knowing what is supposed to be done, and may be complicated by secondary ambiguities, such as not knowing whose expectations are legitimate. If the person experiences role stress as a result of role

stressors or expectations and is unable to cope effectively then role strain or symptomatology occurs.

Kahn et al. (1964) describe the purpose of the study of role conflict and ambiguity as "to make understandable the effects of the contemporary environment on the individual, especially his physical and mental health" (p. 11). The NSM concentrates on "explaining a person's reaction to stressors in the environment" (Reed, 1993, p. 7). By combining the propositions of these two models, and their focus on the reciprocal relationship of the person and environment, it was possible to describe the relationship of obesity in clergy to role stress and eating behaviors, as seen in the conceptual-theoretical-empirical (CTE) structure in Appendix B.

The role of congregational clergy is fraught with conflicting and ambiguous expectancies (Proeschold-Bell et al., 2009). While some clergy may view these role expectations as challenging, many will view them as threatening and experience role stress (experienced role conflict and role ambiguity). In other words, their flexible line of defense will not offer effective protection and their normal line of defense will be invaded (role stress). Once this happens, the clergyperson's lines of resistance are activated to cope with this role stress. However, ineffective attempts to cope may result in role strain or symptomatology. That is, they may use coping behaviors such as emotional eating or be unsuccessful in attempts to restrain eating, resulting in increased risk for a core response (obesity); a sign of role strain.

In summary, role stress occurs when individuals are unable to adequately use the flexible and normal lines of defense, and thus lines of resistance are activated. If the lines of resistance are strong, a clergyperson will not overeat when faced with stressors that

could stimulate overeating. However, if the lines of resistance are weak then overeating may occur. Continued overeating will result in obesity, a sign of role strain, which represents the core response to role stress. Therefore, it was proposed that eating behaviors (emotional and restrained) mediate the relationship between role stress and obesity in LCMS clergy. Research questions were formed to test the mediated effect; that role stress indirectly leads to obesity through altered eating behaviors.

Research Questions

1. Does role stress contribute to explained variance in obesity in congregational clergy?
2. Does role stress contribute to explained variance in eating behavior (emotional and restrained) in congregational clergy?
3. Does eating behavior (emotional and restrained) affect the relation between role stress and obesity in congregational clergy?
4. Does eating behavior (emotional and restrained) completely mediate the relationship between role stress and obesity in congregational clergy?

Need for the Study

This study was needed because clergy have a high prevalence of role stress and obesity, and the relationships between these health problems had not been studied in this group. The link between role stress and eating behaviors is an important, yet overlooked, cause of obesity. The study of the relations between role stress and eating behaviors in clergy will contribute to knowledge for clergy, nurses, and health care providers.

Role stress has been found to increase poor health habits and interfere with the adoption of positive health habits (Brunner, Chandola, & Marmot, 2007; Fernander &

Schumacher, 2008; Lallukka, et al., 2008; Sonnentag & Jelden, 2009). Chronic (role) stressors have the capacity to overwhelm defense and resistance structures, affecting the basic structure of the individual, and leading to symptoms of instability or illness (Neuman, 2011). However, Gigliotti (2001) noted that little NSM-based research focused on the core response, and there is a definite need to study these relationships.

Factors that influence health behaviors and obesity are critical to health care planning for resources needed in the future. The national goals of Healthy People 2020 include: a) Increase the proportion of adults who are at a healthy weight; and b) Reduce the proportion of adults who are obese (US Department of Health and Human Services [USDHHS], 2010). As clergy have been identified as obese and stressed, there are unmet needs related to their health waiting to be identified, and great potential exists for improvement in clergy health.

Although several studies highlighted the problem of obesity in clergy, none investigated the etiology (Halaas, 2002; Proeschold-Bell & LeGrand, 2010). Increased awareness of the detrimental relationship between role stress and obesity will improve the ability of clergy to remedy these problems. Additionally, this knowledge may be included in sermons and in counseling parishioners on health related issues.

There is limited information on the impact of role stress on eating behaviors as studies often utilize artificial laboratory scenarios to portray the impact of stressors on individuals. Additionally studies of eating behaviors typically focus on women, adolescents, and college students, and seldom adult males. Eating behaviors had not been studied in clergy, an important yet overlooked group.

Chapter II

Review of the Literature

This chapter included a review of the literature for the study variables, obesity, role stress, and eating behaviors. Obesity is presented first, including obesity risks, prevalence in the general population and in clergy, and factors related to obesity. Following this is a presentation of role stress, and the role stress and role strain experience. Eating behaviors are then presented, first in relation to neuroendocrine influences, and then emotional eating, restrained eating, and a discussion of the overlap between emotional and restrained eating behaviors. Finally, in the summary, the relationship between clergy and the study variables obesity, role stress, and eating behaviors is explicated.

Obesity

Obesity defined. Obesity is defined by the body mass index (BMI), and is further classified as grades of obesity as follows: BMI = 30 – 34.9 (grade I), BMI = 35 – 39.9 (grade II), and BMI $\geq$ 40 (grade III). Grades II and III reflect a proportionally increased risk of mortality from cardiovascular disease, diabetes, and certain cancers inferring a dose related response (Flegal, Graubard, Williamson, & Gail, 2007; Malnick & Knobler, 2006). However, it is not the BMI alone that predicts mortality risk; the location of adipose tissue is also a critical assessment. Central obesity (visceral fat), is linked to increased insulin resistance, which contributes to hypertension, hyperinsulinemia, impaired glucose tolerance, hypertriglyceridemia, and elevated levels of low-density lipoprotein cholesterol (Kopp, et al., 2010; Schäffler, Müller-Ladner, Schölmerich, & Büchler, 2006).

Accordingly, measurement of abdominal circumference is recommended to assist in assessment of risk for illness when the BMI is in the overweight (25 - 29.9) to grade I range (30 - 34.9) (NIH, 1998). For people in these categories, measurements > 102 cm (40 inches) in men, and > 88 cm (35 inches) in women increase morbidity and mortality risk. However, individuals classified as grades II or III (BMI ≥ 35) are already classified as high risk, and abdominal circumference measurements fail to offer additional assessment benefits (NIH, 1998).

Obesity risks. Obesity was identified as a risk factor for numerous health problems. These include: heart disease, high cholesterol and stroke (Lee, Sui, & Blair, 2009); diabetes (Hussain, Claussen, Ramachandran, & Williams, 2006); hypertension (Williams, 2008); osteoarthritis (Schäffler et al., 2003), and inflammatory diseases such as asthma, rheumatoid arthritis, and hepatic diseases (Michelson, Williams, Benjamin, & Barnato, 2009; Sell et al., 2010). Additionally, several cancers are linked specifically to abdominal adiposity: breast, colorectal, endometrial, prostate, and renal cell (Dixon, 2010; Le Marchand, Wilkens, & Mi, 1992; Moyad, 2001; Stoll, 2002; Wallström, Bjartell, Gullberg, Olsson, & Wirfält, 2009; Xu et al., 2005).

Obesity prevalence. In a detailed analysis sponsored by the CDC, Flegal et al. (2010) reported that the overall prevalence of obesity is 33.8%; 32.2% for men (Grades: I = 17.3%, II = 10.7%, III = 4.2%) and 35.5% for women (Grades: I = 10.5%, II = 17.8%, III = 7.2%). When combined with overweight statistics (BMI > 25 – 29.9), the estimates for overweight and obesity are 68% for men; 64.1% for women. Furthermore, Okosun et al. (2004) report that the NHANES survey data showed that mean abdominal circumference in men increased from 89 cm (1960 - 1962) to 99 cm (1999 - 2000).

Similarly the mean abdominal circumference in women increased from 77 cm (1960 - 1962) to 94 cm (1999 - 2000). Thus we are moving closer to the critical levels of > 102 cm (40 inches) abdominal circumference for men, and have exceeded critical levels of > 88cm (35 inches) for women, which are the values used to further assess obesity related mortality risk (Lean, Han, & Morrison, 1995).

Obesity is most prevalent in the Southern United States (US) where eleven states have the highest (≥ 30%) obesity rates: Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, South Carolina, Tennessee, Texas, and West Virginia (CDC, 2012). Though it is difficult to determine just why this is so, certain demographic variables are associated with obesity. Non-whites comprise approximately 30% of the US population (US Census Bureau, 2010), and most have disproportionately higher rates of obesity. In fact, obesity rates are highest in non-Hispanic Black women (49.6%, 95% *CI* [45.5 - 53.7]) and Hispanic women (43%, 95% *CI* [37.9 - 48.2]), followed by non-Hispanic Black men (37.3%, 95% *CI* [33.2 - 37.7]) and Hispanic men (34.3%, 95% *CI* [28.2 - 40.3]) and lowest in non-Hispanic white women (33%, 95% *CI* [29.3 - 36.6]) and non-Hispanic white men (31.9%, 95% *CI* [28.1 - 35.7]) (Flegal et al., 2010). In Asian Americans visceral obesity, rather than BMI, increases morbidity (Narayan et al., 2010).

Obesity rates are highest in males aged 50 – 59 years old (31.9%), however, the most dramatic weight increase occurs in males aged 18 - 29 (increasing 9.3%) (CDC, 2010a). Burke et al. (1996) noted that males aged 18 - 24 have the highest increase in weight. Thereafter, obesity increases only 2.5% in males aged 30 – 39 to 50 – 59 years. In women, obesity increases gradually, and is highest in the 60 – 69 year-old group (31.3%) (CDC, 2010a).

In addition to age differences, education also plays a role. Higher education is associated with lower BMI as obesity rates are 14% lower in men and 20% lower in women with a master's degree or higher (Schoenborn & Adams, 2010). Marital status also influences obesity, which is highest in divorced or separated women (31.3%) and married men (28.7%) and lowest in widowed (19.2%) and never married men (19.4%) (Schoenborn, & Adams, 2010).

Obesity prevalence in clergy. Though limited in scope, there are several reports that point to the prevalence of obesity in clergy (Carroll et al, 2001; Halaas, 2002; Proeschold-Bell & LeGrand, 2010). Carroll et al. (2001) surveyed pastoral leaders from 212 denominations in the US (N = 883); including Protestant congregational clergy (n = 769); Roman Catholic clergy (n = 43), and clergy from other religions (n = 51). This telephone survey was undertaken to understand the sole pastor role and socio-cultural trends (response rate 72%). Though not the study's primary focus, demographic data included BMI (self-report of height and weight), and classified as: underweight, normal, overweight, and obese. Results revealed that 74.9% of clergy reported weights in the overweight and obese range (BMI > 25) (n = 653), and 28.9% reported weight in the obese range (BMI > 30) (n = 252). It should be noted that the sample's racial/ethnic mix was overwhelmingly white (81%), followed by African American (14.7%), and Asian/Pacific Islanders/American Indians/Alaskan Natives (4.3%); 89% male; mean age 45 - 54; and 69% had a master's degree or higher. Unfortunately, no results of analyses to determine between group demographic differences are reported.

Similar BMI results were found in a study of Evangelical Lutheran Church of America (ELCA) clergy (N = 1460, 76% male) who voluntarily completed "The Summex

Health Monitor" (Chapman, 1987) a 48 question interactive survey (response rate 46%) (Halaas, 2002). Using BMI's calculated from self-report of height and weight, 72% of males and 58% of females had a BMI > 25 (overweight and obese range), and 34% of males and females had a BMI > 30 (obese range). While 100% of this group had Master's or doctoral degrees, which is associated with a lower BMI, the effects of higher education on obesity were not evident here. In one study, obesity rates in those with master's degrees or higher were estimated as 18% in men and 15% in women (Schoenborn, & Adams, 2010). Although no between groups demographic differences were reported, a breakdown of BMI by racial/ethnic group was given. Halaas notes that among "clergy of color" (*n* = 122) (27% African American, 24% Hispanic, 22% Asian, and 12% multi-ethnic) who represented only .08% of the sample, 71% had a BMI > 25 and 36% had a BMI > 30. Thus, comparing the percentages of all participants with those of clergy of color, 6% more clergy of color were in the overweight and obese range than the white clergy and 2% more were obese. The mean age of clergy of color (51 years) and the overall mean age (50.33 years) are similar, thus age does not appear to explain these racial/ethnic differences.

In the most recent study (Proeschold-Bell & LeGrand, 2010), researchers at the Duke Divinity School/Duke University initiated a seven year study aimed at evaluating and improving the health of UMC clergy in North Carolina. Data from this survey of active clergy (*N* = 1,726, 75% male) (response rate 95%), revealed that among male and female clergy aged 35 - 64 years, the obesity rate was 39.7%. This is 10.3% (95% *CI* [8.5 - 12.1]) higher than North Carolina residents, obesity rate of 25 - 29% (CDC, 2010a). This sample was predominantly white (91% white, 7% black), however, non-white clergy

had a remarkably higher obesity rate (51.1%) than did white clergy. The mean age for all participants was age 52, and 71% held a master's or doctoral degree. Again in this study, lower rates of obesity associated with a master's degree or higher are not reflected. Between group differences are also not reported for obesity differences related to age, gender, or education. Though not reported, the author's note that based on higher rates of obesity in non-white clergy, data for whites and non-whites were separately analyzed.

The related factors for the high prevalence of obesity in clergy are unknown. These data reflect a trend of overweight and obesity in clergy in the US that is higher than that in the US population. In fact, the highest obesity rates per US state are 30% and the above studies show that clergy report obesity rates of 28.9% (Carroll et al., 2001), 36% (Halas, 2002), and 39.7% (Proeschold-Bell & LeGrand, 2010). Although the mean age of studied clergy is 45 to 54 years, which has been associated with higher obesity rates, demographic factors that typically predict lower obesity rates in the general population, such as higher education and white race (Flegal et al., 2010; Schoenborn & Adams, 2010), do not predict lower obesity prevalence in clergy.

Obesity related factors. To maintain a normal and consistent BMI, individuals must balance energy consumed against energy expenditure. Some speculate that the current obesity epidemic is, in part, related to reduced levels of physical activity, and clergy do have a lower physical activity level. However, though several factors affect energy expenditure, including activity level (Elbelt et al., 2010), age (Tooze et al., 2007; Vinken et al., 1999) and sleep patterns (Patel, Malhotra, White, Gottlieb, & Hu, 2006; Watanabe, Kikuchi, Tanaka, & Takahashi, 2010), lower energy expenditure can be effectively compensated for by adjusting energy intake. Furthermore, Westerterp and

Speakman (2008) found that while obesity rates increased by 10% between 1988 and 2006, energy expenditure in the general population rose slightly. In fact, they report that data sources in Mastricht, Netherlands (n = 366) revealed a slightly increased energy expenditure (F = 3.89, p = .049) between 1988 and 2006 as did North American data sources (n = 393) (F = 4.89, p = .028) (*df* not reported).

Because increased obesity rates are not adequately explained by decreased energy expenditure, attention to caloric intake appears to be most influential in maintaining a normal and consistent BMI. Population trends reflect significant increases in daily caloric intake in men (+168 kcals, $p < .01$) and women (+335 kcals, $p < .01$) from 1971 to 2000 (CDC, 2004), and non-significant changes in daily intake from 2000 to 2008 (Wright & Wang, 2010). It is thus critical that factors influencing caloric intake be considered. Environmental factors strongly influence caloric intake through internal cues (i.e. cortisol levels, hunger, anxiety) and external cues (i.e. sight and smell of food, eating schedules), which give the individual information on when and how much to eat (Shin, Zheng, & Bertoud, 2009).

It is posited that the ability of internal cues to trigger eating behaviors, as well as the ability to control responses to triggers, may be undermined or activated by certain stressors, resulting in overeating (Konttinen et al., 2010; Wallis & Hetherington, 2004; Wong et al., 2010). In fact, stress is the most powerful factor affecting internal influences of eating behaviors (O'Connor et al., 2008) and the role of congregational clergyman is a most stressful one.

Clergy Role Stress

Kahn and colleagues (1964) tell us that role stress episodes begin with exposure to role stressors in environments. If the focal person, in this case the clergyman, sees these stressors as threatening then he will experience role stress, which will be the initial stress response. Experienced role stress entails feelings of both role conflict and role ambiguity. Role conflict is having too much to do, and role ambiguity is having too little information to do it. Once the clergyman experiences role stress, he will attempt to cope. If his coping is effective, he will successfully ward off the symptomatology of role strain. Though this symptomatology may take many forms (i.e., depression, alcoholism, burnout, etc.), in the present study, role strain was operationalized as obesity. Thus, if exposure to role stressors results in experienced role stress, and the clergyman attempts to cope by overeating, he may experience role strain (obesity).

Role stressors. The Bureau of Labor Statistics (2009) describes the clergy role as requiring the highest level of education, related experience, and job training. Clergy role complexity is compared to that of a surgeon, aerospace engineer, and nurse practitioner. They further note that: "These occupations involve coordinating, training, supervising, or managing the activities of others. Very advanced communication and organizational skills required" (Bureau of Labor Statistics, 2009). Clergy role tasks include leading religious services, preparing and delivering sermons, praying, promoting spirituality, teaching, counseling, home and hospital visits, studying and interpreting religious works, training church leaders, and administering religious rites. In addition congregational clergy must also manage the "business" of the church including balancing a budget, long

range planning, managing staff, community integration, and conflict resolution (Bureau of Labor Statistics, 2010).

To complicate matters further, Monahan (1999) points out that the organizational structure of each church is unique, and a clergyperson may oversee a variety of paid and volunteer staff, and may include supervision of a school. A church may have a senior clergy with one or more junior clergy, or a solo pastor. Several small churches may share one clergyperson. Governance structures vary, ranging from a church board of elders to a complex denominational hierarchy, and are fluid as members move in and out of a church family, and therefore, change the exchange of information and role expectations.

Clergy often respond by working 50 to 60 hours per week, including evening functions, and weekend services and rites; and many work on their midweek days off (Kay, 2000). Halaas (2002) describes this concept of clergy overwork as a form of boundary confusion and concludes that clergy often put the care of others before attending to their own needs. Contributing to clergy role stress are internal pressures to succeed, and to maintain authority and a stable base of parishioners (Evers & Tomic, 2003; Hoge & Wenger, 2005; Lee, 1994). This concept is best explained by Stark and Iannaccone (1994) who describe a theory of religious mobilization, whereby competition influences religious choices. As noted earlier, there are numerous religious denominations in the US creating a competitive atmosphere for clergy to attract parishioners and keep them involved. Hoge and Wenger (2005) note a Protestant trend of church shopping based on attraction to "…programs, inspiration, like-minded people, and convenience," (p. 6) rather than joining a church based on denomination.

Role stress. Role stressors may lead to experienced role stress (experienced role conflict and role ambiguity). The contribution of work complexity to experienced role stress is shown in a study of ministers (N = 58, 36 male, 22 female, response rate 60%) of the United Reformed Church of England. A questionnaire consisting of open ended questions was mailed to all ministers in the West Midlands Synod to explore self-perceptions of work-related psychological health (Charlton, Rolph, Francis, Rolph, & Robbins, 2009). Primary triggers of experienced role stress were the amount of work and the number of roles in their day-to-day experience. Thus they experienced feeling that there was too much work to do in too little time. They had to juggle many different activities/responsibilities; and had to meet difficult work deadlines. Interestingly, these responses are almost identical to those offered by Kahn and colleagues (1964) in their descriptions of experienced role stress.

Kahn and colleagues (1964) also note that when role stress is high, job satisfaction is low. This was a finding in UMC clergy (N = 293, 24% female, 76% male) in the Baltimore-Washington Conference (Kemery, 2006). Using The Job-in-General Scale (Ironson, Smith, Brannick, Gibson, and Paul, 1989) and the RCAS (Rizzo et al., 1970) bivariate correlations revealed that role conflict and role ambiguity were positively correlated with each other (r = .49, p < .001), and were both negatively correlated with satisfaction with appointment (r = -.47, p < .001, and r = -.32, p < .001, respectively).

Likewise, Monahan (1999) investigated experienced role ambiguity in a mail survey of clergy (N = 168) in ten denominations in northern California (median Sunday attendance of 120 adults). Clergy were asked about their role in completing church tasks, and sharing control with others. Role ambiguity was measured with three questions,

using a four point Likert scale, adapted from work by Kahn et al. (1964). This scale had a possible value range of 0 to 12, and a mean ambiguity level of 3.6 was reported. Middle-manager characteristics of the clergy role were directly related to higher levels of role ambiguity. That is, higher levels of role ambiguity were reported by clergy who reported to both congregation and denominational elders ($r = 0.19$, $p < .05$), and those with a higher task load ($r = 0.21$, $p < .05$). In contrast, having a job description ($r = -0.59$, $p < .05$) and years of seniority ($r = -0.13$, $p < .10$) were negatively correlated with role ambiguity, however, seniority was not statistically significant.

Age/seniority and personality traits were significant contributors to role conflict, in a study of clergy roles in British Pentecostal ministers ($N = 930$, 97.5% male) (Kay, 2000). Clergy's own priority ranking of individual clergy roles (intrinsic role prioritization) was compared to their perceptions of others' role expectations (extrinsic role prioritization). Role conflict was operationalized as the difference score between intrinsic and extrinsic role prioritization. Negative *t* values and statistically significant higher mean scores for extrinsic role prioritization indicated that the clergyperson's perception of what they think is expected of them was higher than their own sense of priority for 15 out of 20 roles. Interestingly, mean differences for prioritization were greatest for the following roles ($p < .001$): visitor ($t = -20.84$); administrator ($t = -17.03$); manager ($t = -15.72$); fund raiser ($t = -14.94$); counselor ($t = -14.55$); and role of pastor ($t = -11.86$), indicating that ministers experienced the greatest conflict over expectations surrounding these roles, and demonstrating evidence of role conflict. Role conflict was positively correlated with neuroticism ($r = .23$, $p < .001$) and negatively correlated with age/seniority ($r = -.12$, $p < .01$).

Similarly, this negative association between age/seniority and role stress is reported in numerous studies and in a variety of denominations (Evers & Tomic, 2003; Francis et al., 2004; Hoge, Shields, & Soroka, 1993; Ok, 2009). This may in part be explained by attrition. For example, in a study of UMC clergy 10 years after ordination, 59% of clergy remained in parish ministry and, at 20 years only 42% remained (Memming, 1998). Therefore, those with the greatest coping skills may be the ones with the longest careers. However, age is not always synonymous with seniority as some choose this vocation as a second career, and some clergy move in and out of the congregational role. Therefore, clergy with less role seniority and greater perceptions of role stress will have the greatest risk for role strain.

Role strain. When an individual is unable to successfully cope with role stress, the ultimate result is role strain, where its effects are exhibited as symptomatology. In a qualitative study of UMC clergy in North Carolina, 11 focus groups ($N = 59$) were conducted to understand the phenomenon of clergy health (Proeschold-Bell et al., 2009). Two themes of clergy health were identified: self-care and coping, and stress. Conditions described as having the greatest effect on clergy health are: the ability to set boundaries; the perception that the pastor is available 24 hours/day; church health and functioning; itinerancy; and financial strain. In the present study, obesity is a sign of role strain. However, following Neuman's (2011) proposition that the basic structure or core response is composed of all five person variables, role strain could also be conceptualized as physiological, psychological, socio-cultural, developmental, or spiritual responses to role stress (Günüsen et al., 2009).

For example, burnout is composed of three constructs: emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach & Jackson, 1981), and is an example of chronic stressors producing psychological symptomatology. Doolittle (2007) studied emotional exhaustion in UMC clergy utilizing the Maslach Burnout Inventory (Maslach & Jackson, 1981). Emotional exhaustion (role strain) was positively correlated with the following maladaptive coping strategies in clergy: self-blame ($r = 0.43$, $p < .0001$), disengagement ($r = 0.30$, $p < .0001$), venting ($r = 0.28$, $p < .0001$), distraction ($r = 0.27$, $p < .0001$), denial ($r = 0.23$, $p < .001$), and substance abuse ($r = 0.30$, $p < .0001$).

Because burnout is a form of role strain and is thus a result of role stress, it is not surprising that younger clergy (high role stress) have higher rates of burnout. Tomic et al. (2004) investigated burnout in caring professions. In a sample of ministers of the Reformed Church (The Netherlands) ($N = 424$, 83% men, 17% women), increased susceptibility to stress was found in younger clergy, with a significant negative relation between age and emotional exhaustion ($\beta = -0.09$, $p < .05$) and depersonalization ($\beta = -0.14$, $p < .01$), and the number of years of work experience were negatively correlated with emotional exhaustion ($r = -0.45$, $p < .001$) and depersonalization ($r = -0.12$, $p < .005$). Thus seniority in the clergy role may diminish role strain.

Although to date there are no studies that conceptualize role strain as obesity in clergy, obesity has been studied in other groups. Lallukka and colleagues (2005) analyzed data from 40 to 60 year-olds in a cross-sectional study, to examine the associations between psychosocial working conditions (role stress) and weight gain. For men ($n = 1,799$), the probability of weight gain was high with medium work fatigue

(*OR* 1.49; 95% *CI* [1.11 - 2.00]), high mental strain (*OR* 1.45, 95% *CI* [0.90 – 2.33]), and working overtime (*OR* 1.36, 95% *CI* [1.00 - 1.83]).

Similarly, in a prospective, longitudinal study of 35 to 55 year-olds (*n* = 4,895 in final phase), Brunner et al. (2007) examined the effect of job strain on general and central obesity. High chronic role stress was associated with high waist obesity in men (*n* = 2,288) (*p* < .01, *OR* 1.46; 95% *CI* [1.14 - 1.87]) and high BMI (*p* < .01, *OR* 1.92; 95% *CI* [1.13 - 3.24]). Chronic role stress was defined as high job demand, low decision latitude, and low work social support, which are described as components of role conflict and role ambiguity by Kahn et al. (1964). Therefore, obesity is a result of an inability to cope effectively with role stress, and a primary form of ineffective coping is pathological eating behaviors, which lead to obesity.

Eating Behaviors

Ideally, eating is a physiological response to cues of hunger and satiety. Herman and Polivy (2008) describe internal cues that regulate the hunger-repletion-satiety-depletion-hunger cycle as "physiological" or intuitive eating, and describe the impact of cues suggesting appropriate amounts to eat as "the normative effect" (p.727). However, they posit that only at the extremes of hunger and satiety do people have a clear sense of internal cues (Herman & Polivy, 2005). This is reflected in the high overweight and obesity rates in the US.

About one third of the US population is not overweight or obese (32% of men, 35.9% of women) (Flegal et al., 2010). This segment of the population includes individuals who are intuitive eaters, as well as emotional eaters who are not activated to overeat, successful restrained eaters, those who have had bariatric surgery or medical

conditions (including anorexia and bulimia), and underweight individuals. Therefore, few individuals may be intuitive eaters.

For those who are not intuitive eaters, internal environmental cues to eat may be balanced by the use of self-control processes to restrain food intake or physical activity may be increased to control BMI. However role stress may alter perceptions and increase feelings of hunger, and thereby negatively affect eating behaviors, leading to weight gain. Some researchers have found that emotional eaters perceive increased hunger when faced with particular stressors (Konttinen et al., 2010; Slochower et al., 1981), and restrained eaters' ability to restrain food intake is undermined by stressors, resulting in overeating (Elfhag & Morey, 2008; Wong et al., 2009).

After a discussion of neuroendocrine factors, which may explain how environmental cues affect eating behaviors, two distinct pathological eating patterns that have been correlated with stressors and obesity will be discussed: emotional and restrained eating. It should also be noted here that there is a third eating behavior, external eating (having increased sensitivity to external food cues), which is not associated with obesity or role stress (Van Strien, Herman, & Verheijden, 2009; Wong et al., 2009), and therefore was not investigated in the present study.

Neuroendocrine influences on eating behaviors. Though the relation between eating behaviors and stress is often conducted in laboratories, it is difficult to accurately depict the human response to chronic stress in this manner. Differences in neuroendocrine responses to acute versus chronic stress have been identified. Acute stress activates a fight or flight response and activation of the sympathetic-adrenomedullary (SAM) system, which suppresses appetite and slows digestion (Everly

& Sobelman, 1987; Folkow, 2000). Chronic stress, however, results in hyperactivation of the hypothalamic-pituitary-adrenal (HPA) axis and release of cortisol, a chemical that stimulates hunger, visceral obesity, insulin resistance and immune system depression (Björntorp, Holm, Rosmond, & Folkow, 2000; Tsigos & Chrousos, 2002).

Elevation in cortisol may therefore be the chemical basis for overeating in emotional and restrained eaters. Adam and Epel (2007) note that eating behaviors are similar to addictive behaviors in that over-eating and eating high fat/high sugar foods provides an endogenous opioid release, which is part of a powerful coping mechanism, protecting the individual from the detrimental effects of stress by decreasing activity of the HPA axis, and thus attenuating the stress response. Opioid signaling within the central nervous system is a powerful stimulus for use of drugs, nicotine, alcohol, and food intake (Maldonado & Berrendero, 2010; Taha, 2010).

Use of eating as an "escapist" coping behavior was studied in urban transit operators, a group with high rates of mortality and morbidity, and high role stress (Chen & Cunradi, 2008). In this group (N = 1,231), role stressors such as problems with equipment, passengers, and road conditions were found to overwhelm the transit operator and eating was frequently utilized as a coping behavior. Using structural equation modeling, eating was found to mediate role stress intensity, which was indirectly and positively related to role strain (ß = .08, $p < .001$). Emotional eating and unrestrained eating in restrained eaters have been posited to be forms of pathological eating behaviors associated with the stress response (Van Strien, Frijters, Bergers et al., 1986).

Emotional eating behavior. Emotional eating is the phenomenon whereby individuals overeat in response to strong emotions as a means to relieve discomfort either

due to an inability to distinguish these as separate entities or an association of these sensations as hunger at a young age (Kaplan & Kaplan, 1957; Bruch, 1964). Bruch describes the case of an infant who spent long hours in a high chair and who was fed rather than picked up and comforted when he cried. This example of substituting food for comfort formed the basis of conceptual confusion for this child who by age 14 weighed 300 pounds. Slochower (1987) posits that obese individuals, who are emotional eaters, are unable to accurately label their emotional states and attributes this to an early disruption of the connection between eating and hunger.

Emotional eaters feel hunger and eat more, especially high fat and high sugar foods, when strong emotions such as anxiety and loss of control are experienced. Slochower et al. (1981) compared the effects of life stress on mood and eating in obese and non-obese female college students ($N = 47$). At two laboratory sessions (during exam week and 3 weeks later) participants' BMI's were calculated, they completed 13 mood scales, an open-ended question probing control over feelings, and were given an opportunity to eat candy. Both non-obese and obese students were more anxious ($F = 13.3$, $p < .001$) and less in control of their feelings ($F = 5.68$, $p < .02$) (*df* not reported in this study) during exam week. However, only obese students ate statistically significantly more during exam week in the Subjects x Session interaction ($F = 4.70$, $p < .05$). For obese students eating was positively related to anxiety at both Sessions 1 (obese, $r = 0.45$, non-obese, $r = -0.58$; $p < .05$) and 2 (obese, $r = 0.61$, $p < .01$; non-obese, $r = -0.37$, NS). Only obese students ate more when they experienced a loss of control over feelings [(Session 1: obese $r = -0.40$, $p < .05$; non-obese $r = -0.27$, NS); (Session 2: obese $r = 0.57$, $p < .01$; non-obese -0.27, NS)]. Therefore, high anxiety and feelings of

loss of control were significantly related to student role stress and resulted in increased eating in obese subjects.

In addition to merely overeating, emotions also can increase consumption of high sugar and high fat foods, which as noted provide an opioid release (Maldonado & Berrendero, 2010; Taha, 2010), but are also associated with obesity. The associations among emotional eating, food choices, and depressive symptoms were studied in a random sample of Finnish 25-to-64 year olds (men, n = 1,679; women, n = 2,035) (Konttinen et al., 2010). Participants completed questionnaires on eating styles, depressive symptoms, physical activity, and food frequency, and BMI and waist circumference were obtained. Increased depressive symptoms were related to emotional eating in both genders (r = 0.31, p < .001), as well as to increased BMI (men r = .30, women r = .31; p < .001) and increased waist circumference (men r = 0.28, women r = 0.30; p < .001). For emotional eaters, the risk of being in the highest quartile for consumption of sweet energy-dense foods was highest in men though women who are emotional eaters also were at greater risk of being in the highest quartile (men, *CI* 95%, highest quartile, *OR* = 2.24 [1.54 - 3.25], p < .001) (women, *CI* 95%, highest quartile *OR* = 1.67 [1.18 - 2.37], p < .01). However, risk for consumption of *non-sweet* energy-dense food was statistically significant in men only (*CI* 95%, highest quartile, *OR* = 2.03 [1.39 - 2.95], p < .001). In comparison, consumption of fruits and vegetables was low and insignificant in all emotional eaters. These findings highlight the relationships of emotional eating to symptomatology (depression, increased BMI, increased waist circumference) and increased consumption of high calorie foods.

Similarly, daily stressors were found to increase preference for between-meal snacks (β = 0.043, p < .001) and a reduction in main meals (β = -0.050, p < .001) and vegetable consumption (β = -0.032, p < .001) in working adults aged 18 to 65 years (N = 422, 46% male) (O'Connor et al., 2008). Daily stressors and food intake were recorded for four weeks and participants completed the Dutch Eating Behaviour Questionnaire (Van Strien, Frijters, Bergers et al., 1986), the Disinhibition scale of the Three Factor Eating Questionnaire (Stunkard & Messick, 1985), and demographic data. Only emotional eating behaviors influenced the stressors-snacking relationship (β = 0.039, p < .05) and the authors concluded "emotional eating style is the pre-eminent individual differences variable in understanding the impact of stress on eating behavior" (p. 27). Emotional eating moderated the stressors-snacking relationship, and overeating occurred when the emotional eater faced ego threatening (p = .003), work related (p = .003), and interpersonal (p = .012) stressors. Therefore ineffective coping with role stress may induce emotional eating in some clergy and thereby contribute to obesity.

Restrained eating behavior. Restrained eaters do not eat intuitively, but attempt to control BMI by consciously restraining food intake (Herman & Mack, 1975; Herman & Polivy, 1975), and therefore often have higher BMI's (. Certain factors such as alcohol consumption, tasting highly palatable food, anxiety, or stress, lead to counter-regulation where self-control processes are undermined, which overwhelms the ability to restrain food intake. Over-eating then occurs, and is followed by increased restrained behavior (Polivy & Herman, 1976a, 1976b; Polivy, Coleman, & Herman, 2005). As a consequence, an individual may repeatedly lose and re-gain weight, leading to feelings of persistent hunger and loss of contact with internal sensations of hunger and satiety

(Herman & Mack, 1975; Herman & Polivy, 1975; Wardle, 1986). This behavior requires cognitive energy to maintain and therefore, stressors and distracters increase eating in restrained eaters, however this is followed by increased restrained behavior (Boon, Stroebe, Schut, & Ijntema, 2002; Elfhag & Morey, 2008; Wong et al., 2009).

This concept was examined in a convenience sample (N = 115) of female college students, in which restrained eaters (n = 56), identified by the Restraint Scale (Polivy, Herman, & Warsh, 1978), were compared to a normal group (n = 59) (Boon et al., 2002). Restrained eaters were found to have a significantly higher BMI (t = - 6.6, p = .00) than unrestrained eaters. When told the caloric content of ice cream was high, and no distraction was introduced, restrained eaters ate slightly, but not statistically significantly less than unrestrained eaters (F (1,52) = 0.2, NS). However, when told the calorie count was high and they were distracted, restrained eaters ate statistically significantly more than the unrestrained eaters (F (1,52) = 5.1, p < .05). Thus, distraction is a powerful influence on eating behavior in restrained eaters. Considering that the main source of clergy role stress is role complexity, distraction is an important concern for clergy who are restrained eaters. That is, restrained eating requires cognitive energy to maintain, and role stress may deplete energy available for restraining food intake.

The relation between anxiety and restrained eating was also investigated in a convenience sample of obese Swedish patients (N = 442) (male, n = 160; female, n = 282) (Elfhag & Morey, 2008). Participants completed the DEBQ (Van Strien, Frijters, Bergers et al., 1986) and NEO Personality Inventory (Costa & McRae, 1992). Mean self-report of BMI was 40.5 and mean age was 43.7 years. Restrained eating was

negatively correlated with anxiety (r = -.20, p < .001), and lower anxiety best predicted successful restrained eating behavior.

This same study also investigated the relations between certain personality traits and restrained eating. In the full sample (men and women), openness (r =.13, p < .01), competence (r =.13, p < .01), order (r =.12, p < .01), dutifulness (r =.16, p < .01), and achievement striving (r =.22, p < .001) were positively correlated with restrained eating. However, these personality traits may be most affected by unclear and conflicting expectations, unpredictability, and lack of information associated with increased role conflict and role ambiguity. Therefore, personality traits of restrained eaters, as well as complexity of the clergy role, may make these individuals more susceptible to role strain. As stated earlier, counter-regulation is thought to undermine self-control processes and ability to restrain food intake (Polivy & Herman, 1976a, 1976b; Polivy et al., 2005). This lends support for role stress leading to counter-regulation and overeating and subsequent weight gain (obesity) in clergy who are restrained eaters.

Restrained and emotional eating. Restrained eating may also appear in emotional eaters, providing an overlap in eating behaviors (Macht, 2008), and some view "emotionality" as an aberration of restrained eating (Polivy et al., 1978). An overlap in eating behaviors was found in the following study of nurses in a hospital setting.

The effect of shift change, a form of role stress, on eating behaviors was studied in nurses (N = 378) in a hospital in Hong Kong (Wong et al., 2009). The DEBQ (Van Strien, Frijters, Bergers et al., 1986), the Perceived Organizational Support scale (POS) (Eisenberger, Huntington, Hutchinson, & Sowa, 1986), and demographic questions were utilized. Changing from day to night shift duty (at least four times per month) increased

the odds of both restrained eating behavior (*OR* 3.348, 95% *CI* [1.757 - 6.38], $p < .001$) and emotional eating (adjusted *OR* 2.914, 95% *CI* [1.5666 – 5.422], $p < .001$). However, some participants in this study reported more than one eating behavior, that is 64% of participants had high restrained and 66.4% had high emotional eating scores.

In a cross-sectional study of Dutch adults utilizing a larger sample ($N = 1{,}342$) (mean age 33.6 years), Van Strien, Herman, & Verheijden (2009) examined factors related to obesity in a sample of normal weight (BMI < 25) and overweight (BMI ≥ 25) individuals. In an analysis of the simultaneous impact of eating types as moderators of overconsumption and obesity, both emotional ($\beta = 0.196$, $p < .001$) and restrained ($\beta = -0.106$, $p < .01$) eating predicted high BMI, but not external eating (β not reported). However, the interaction between eating behaviors was not examined in this study.

Summary

Thus, it was expected that obesity rates would be higher in clergy with high role stress who cope through the use of emotional and/or restrained eating behavior. Because stressors increase hunger and eating in emotional eaters (O'Connor et al., 2008) it was expected that clergy with high role stress, who were emotional eaters, would be obese. It was expected that obesity rates would also be high in clergy who had high role stress and restrained eating behavior. This is because restrained eating behavior is most affected by distraction (Boon et al., 2002). Therefore, the ability to restrain food intake would depend on the amount and complexity of clergy role stress. Therefore, emotional and restrained eating may mediate the relations between role stress and obesity in clergy through different mechanisms due to the unique qualities of these eating behaviors.

Chapter III

The Method

Design

In this descriptive cross-sectional study, a random sample of married LCMS clergy serving congregations was used to gather data to explore the relations between the dependent variable, obesity, and the independent variables, role stress and eating behaviors (emotional and restrained eating). Participants were contacted by email, and asked to complete the RCAS (Rizzo et al., 1970, Appendix C), the Emotional and Restrained Eating Behavior scales of the DEBQ (Van Strien, Frijters, Bergers, & Defares, 1986, Appendix D), and demographic questions (Appendix E). Obesity was measured by BMI group. Data was analyzed for relations among variables using multiple regression analyses of variance, with alpha set at .05 and power at .80.

Sample

The planned sample for this study was 159 active LCMS congregational clergy (all male), who were currently married and had no history of bariatric surgery, anorexia, or bulimia. This sample size was recommended by Fritz and MacKinnon (2007) for a test of joint significance of paths a and b in a mediational model with an estimated .26 effect size, which is halfway between Cohen's (1988) criteria of .14 (small) and .39 (medium) effect sizes. Though no pilot data were available, a .26 effect size was chosen based on effect sizes reported in the literature for the relations between role stress and eating behaviors (range: .21 to .61) and eating behaviors and obesity (range: .25 to .35) (Elfhag & Morey, 2008, Konttinen et al., 2010; Slochower et al., 1981). In order to

achieve this projected sample size, responses from 1,272 LCMS clergy were solicited. This number was based on the following considerations.

As web based surveys are relatively new as a delivery mode, data on response rates is not well described in the literature. Though Dillman, Smyth, and Christian (2009) provided strategies to improve response rates, which were utilized in this study, they did not offer response rate predictions. However, two recent web delivered surveys involving clergy yielded response rates of 39% (Hook & Worthington, 2009) and 52.6% (Stutz, 2008). A conservative overall estimated response rate of 20% was further reduced to a 12.5% estimated response rate, to allow for hard-bounce (invalid email address) and soft-bounce (full mailbox and spam filtered email), and exclusion of clergy who did not meet the study's criteria. This conservative estimate was further influenced by the possibility that data from Blacks and Hispanics, who have higher rates of obesity, might need to be analyzed separately.

Data Collection

Human Subjects approval was granted from the Institutional Review Board at City University of New York Graduate Center (CUNY-GC) (Appendix F). Lutheran Church-Missouri Synod (LCMS) also gave its' approval (Appendix G). Although a sample of 159 clergy was needed, a list of 1,272 clergy email addresses randomized via the Microsoft Access software program (Microsoft Access, 2010); from a list of 5,771 active congregational clergy was purchased from LCMS, and used only for this study. These congregational clergy consist of Sole, Senior-Administrative, Associate, and Assistant pastors, and 15.6% do not report having email addresses. Only clergy with

email addresses were included in this study. Clergy without email addresses ranged from 9% in Senior-Administrative pastors to 31% in Assistant pastors.

All emails to clergy were generated from an email account created for this study (LCMSCongregationalClergyStudy@gmail.com), and the "Blind CC" feature was used so that the names of participants were protected. The first email contact was planned to be an invitation to participate in the survey by a letter of introduction from an LCMS clergyman (Dr. Rev. Robert Hartwell, Bronxville, N.Y.) who agreed to help by personally introducing the study five days before the survey was sent (Appendix H) (sent from the LCMSCongregatonalClergyStudy email address). Participants then received an email with information about the anonymous survey, the researcher, and the faculty sponsor (Appendix I). Included was a URL link to the survey, which was designed utilizing SurveyMonkey, a web survey delivery tool.

Seven days after the survey was sent, a follow-up reminder (with URL survey link) was sent (Appendix J), followed by a second reminder (with URL survey link) seven days later (Appendix K) (Dillman et al., 2009). As it was not possible to know who did and did not respond, all 1,272 clergy received reminders (unless they asked to "unsubscribe"). Included was a note of thanks to those who had already completed the survey, and a reminder to only complete the survey one time. Branching features were used for clergy demographic questions (see Appendix E) and participants could skip questions that they did not wish to answer. The participants were provided with the researcher's email address in the event that they did not wish to participate or receive further emails, or they had questions regarding the research study.

A unique feature of the SurveyMonkey service is that all survey responses were automatically entered into a data file set up by the investigator in advance through SurveyMonkey, and the investigator was able to then download the file into PASW 18 (2011) and store this on a computer that was protected by user ID and password. Participation in this survey involved minimal risk to the participants (see Appendix L). All responses were anonymous, with no identifying information on the returned response. Participants were informed that clicking on the survey link would be considered tacit consent, and this further protected anonymity compared to a written consent. After dissertation defense, an email will be sent to all 1,272 potential participants informing them of the study results. The time required to complete all survey questions was approximately 15 to 20 minutes.

Only the researcher and faculty sponsor had access to the data. Data will remain in a password protected file in the researcher's computer for a period of at least three years, and will be kept in the strictest confidence. Additionally, Symantec Endpoint Protection, an anti-virus/firewall product, will protect this computer from internet threats.

Instruments

Role Conflict and Ambiguity Scales. The RCAS (Rizzo et al., 1970) measures role stress (role conflict and role ambiguity) in complex organizations. The RCAS is based on Kahn et al.'s (1964) definition of role stress as experienced role conflict, the perception that role expectations from various sources are conflicting and lack clarity and predictability, and role ambiguity, which is the lack of vital information needed for performance of a role. Kahn et al. further defined role conflict as person-role conflict, inter-role conflict, inter-sender conflict, and intra-sender conflict. Ambiguity is

distinguished by the focus of the individual's feeling of uncertainty: those related to tasks, and those related to socio-emotional aspects of role performance. High scores on these self-administered scales indicate high role stress.

Validity. Rizzo et al. (1970) do not describe establishment of face validity of the scales, but construct validity was established in multiple studies. An initial 29 items (15 role conflict, 14 role ambiguity) were subjected to Exploratory Factor Analysis with Varimax rotation. Two factors (role conflict and role ambiguity) accounted for 56% of variance. The 29 item set was then abridged to 14 items (role conflict 8 questions, role ambiguity 6 questions) based on factor loadings of .30 and loading primarily on only one factor (singularity).

Validity of the 14-item scale was further examined by Schuler, Aldag, and Brief (1977), comparing properties across six samples (N = 1,573). Predictive validity was established by correlations of the RCAS with other constructs known to be correlated with role stress, most importantly job satisfaction. The relation between the RCAS and job satisfaction, which was measured by the Job Descriptive Index (JDI) (Smith, Kendall, & Hulin, 1969), was statistically significant (W = .61; X^2 = 32.94; df = 9, p < .001).

Smith, Tisak, and Schmieder (1993) used confirmatory factor analysis to test construct validity in three independent samples (S_1, S_2, S_3) of workers. A two-factor (role conflict and role ambiguity) solution where factors are correlated and allowed to cross-load, best fit the data (S_1, χ^2 = 127.49, df = 64, χ^2/df = 1.99) (S_2, χ^2 = 95.75, df = 64, χ^2/df = 1.50) (S_3, χ^2 = 217.86, df = 64, χ^2/df = 3.4). As the relative chi squares (χ^2/df) for this model are 3.40 and less, a good model fit is indicated (Mueller, 1996). Factor inter-correlations for this model are: S_1, r = .65; S_2, r = .62; and S_3, r = .36. Discriminant

validity of this model is supported as the correlations between factors indicate that the shared variance of these scales ranges from 42% in S_1 to 13% in S_3. These low cross-construct correlations provide evidence for two distinct constructs, demonstrating construct validation and discriminant validity.

Similarly, Schuler and colleagues (1977) report statistically significant correlations between the two scales ranging from $r = .50$ to $r = .18$, with an average of $r = .34$ across 6 samples, and 12 percent variance shared. Thus, there is a moderately strong relationship between role conflict and role ambiguity. This is further evidence of discriminant validity.

Reliability. Test-retest reliabilities were reported by Schuler et al. (1977) across two samples, repeated after 7 months; .44 ($p < .001$) for role conflict and .40 ($p < .001$) for role ambiguity. These values indicate reasonable stability for the RCAS (Kenny, 1975). Rizzo et al. (1970) reported Cronbach's alpha of two samples to be .82 and .82 for role conflict; and .78 and .81 for role ambiguity and Schuler et al. report Cronbach's alpha of .75, .71, .76, .82, .56, and .72.for role conflict; and .78, .81, .83, .87, .63, and .71, for role ambiguity across six samples. Cronbach's alpha across three samples (social service workers, $N = 203$, manufacturing employees, $N = 234$, and workers of organizations, $N = 507$) reported by Smith et al. (1993) are: role conflict .75, .82, and .81; and role ambiguity .73, .80, and .74. Similarly, in a study of nurses ($n = 81$) and physicians ($n = 170$) Tunc and Kutanis (2009) report Cronbach's alpha of .82 for role conflict and .79 for role ambiguity. Reliability coefficients $\geq .70$, indicate that these scale reliabilities are acceptable (Cortina, 1993).

Scoring. A seven-point Likert scale is used, ranging from 1(Definitely not true) to 7 (Extremely true) for this 14 item scale, which is scored as one (range 14 - 98). Role conflict items are negatively worded, and role ambiguity items are positively worded. For scoring, the positively worded items (role ambiguity) are reverse scored and a high score on these scales reflects high role stress.

Dutch Eating Behaviour Questionnaire. The DEBQ was developed with questions from three other tools: the Eating Patterns Questionnaire (EPQ) (Wollersheim, 1970); The Fragenbogen für Latente Adipositas (FLA) (Pudel, Metadorff, & Oetting, 1975); and the Eating Behavior Inventory (EBI) (O'Neil et al., 1979). The DEBQ (33 items) was developed in Dutch to measure three eating behaviors: emotional (13 items), external (10 items) and restrained (10 items) (Van Strien, Frijters, Bergers et al., 1986). An official English version was written by Van Strien (2002). Only the emotional and restrained eating items will be used in this study.

Emotional eating is defined as eating in response to both diffuse and clearly labeled emotions (Van Strien, Frijters, Bergers et al., 1986) and restrained eating is defined as the degree that an individual eats less than he or she would actually like to eat (Van Strien, Frijters, van Staveren, Defares, & Deurenberg, 1986). This self-administered tool has been translated into Korean (Kim, Lee, & Kim, 1996) and Italian (Caccialanza et al., 2004). It has been used in numerous studies with children, adolescents, and adults (Van Strien, Frijters, Bergers et al., 1986; Wardle, 1987).

Validity. Construct validity was initially established in samples of male and female, obese and non-obese adults (Van Strien, Frijters, Bergers et al., 1986). The DEBQ was tested and refined in three different studies, and in the final study (N = 1,170),

an item pool of 33 items was subjected to exploratory factor analysis. A four factor orthogonal (Varimax) solution showed items on restrained eating (factor loadings ≥ .71) and external eating (factor loadings ≥ .45) had high loadings on only one factor. However, emotional eating items loaded on two factors (factor loadings ≥ .46), eating in response to diffuse emotions and to clearly labeled emotions. These items were combined to form one 13 item scale. External and restrained eating scales each contain 10 items. In this analysis, measures on emotional, restrained, and external eating among the different groups were highly correlated (r = .94, .95, and .80 respectively), demonstrating convergent validity. Additionally low correlations between the constructs demonstrates discriminant validity (emotional and restrained, r = .33) (emotional and external, r = .50) (restrained and external, r = .17).

Validation of the English version of the DEBQ was done by Wardle (1987) in two British studies. In the first analysis, the three scales were administered to "normal" male and female students (N = 147) aged 18 to 60 years (M = 22 years). Scores on the three scales were subjected to factor analysis with orthogonal Varimax rotation. A three factor (emotional, restrained, and external) solution was derived accounting for 55.2%, 30.2%, and 14.6% of variance respectively. Restrained eating (t = 7.1, $p < .001$) and emotional eating (t = 3.63, $p < .001$) were significantly higher in women than in men.

In the second study, Wardle (1987) administered the DEBQ to three groups of people (mostly female) with known eating/weight disorders in order to establish predictive validity: a weight watchers group (n = 107), a bulimic group (n = 61), and an anorexic group (n = 33). These scores were compared with each other as well as to

scores of normal women. Mean scores for restrained eating behavior were similar for weight watchers (3.71, *SD* ± 0.63), anorexic (3.79, *SD* ± 0.91) and bulimic (3.73, *SD* ± 0.76) groups. Emotional eating was higher in bulimic women than overweight women ($t = 5.2$, $p < .001$), and emotional eating in overweight women was higher than normal women ($t = 3.45$, $p < .001$). Anorexic women scored significantly lower than normal women on emotional eating ($t = 1.88$, $p < .001$). External eating behavior was significantly higher in bulimic clients when compared to weight watchers clients ($t = 2.97$, $p < .005$), and anorexic clients scored lower than normal women ($t = 4.49$, $p < .001$). These findings demonstrate strong predictive validity for this tool.

In a predictive validation of the restrained scale ($N = 110$) (Van Strien, Frijters, van Staveren et al., 1986), a negative mean deviation of energy intake from energy requirement (-278 Kcal, $SD = 641$) was used to demonstrate eating less than desired. A significant correlation between the restrained scale score and eating less than desired (-.45, $p < .01$) demonstrated that subjects that ate less scored higher on the restraint scale ($M = 2.52$, $SD = 0.89$).

Reliability. Van Strien, Frijters, Bergers et al. (1986) report high Cronbach's alpha coefficients for the three scales for all subjects in the final study ($N = 1,170$): emotional eating .94, restrained eating .95, and external eating behavior .80. In a study by Van Strien, Herman, and Verheijden (2009) ($N = 1,342$) of normal weight and overweight/obese subjects, Cronbach's alphas are similarly high: emotional eating .96, restrained eating .92, and external eating .85. O'Connor and O'Connor (2004) also report similar Cronbach's alpha in a study of female university students ($N = 131$): emotional eating .92, restrained eating .93, and external eating .86.

Scoring. A Likert type scale was used for responses, ranging from 1 (never) to 5 (very often), and some items have a "not-relevant" response option. The scales take approximately 10 minutes to complete, and the reading level is reported as between the fifth and eighth grades (Allison & Franklin, 1993). The score on each scale is derived by dividing the sum of items by the total number of items on that scale. A high score on an individual scale indicates a high degree of that particular eating behavior (Score ranges: 1 – 5 on all scales).

BMI. Demographic questions (see Appendix E) included self-assessment of height and weight, which were used to calculate Body Mass Index (BMI). The following BMI categories were used for analysis (0 = ≤ 18.59 BMI; 1 = 18.6 ≤ BMI ≤ 24.99; 2 = 25 ≤ BMI ≤ 29.99; 3 = 30 ≤ BMI ≤ 34.99; 4 = 35 ≤ BMI ≤ 39.99; and 5 = BMI ≥ 40). Self-report of height and weight are considered valid measures of BMI (Dhaliwal, Howat, Bejoy, & Welborn, 2010; Stommel & Schoenborn 2009).

Personal data. A demographic data section (see Appendix E) was constructed by the investigator to collect information about personal characteristics and role descriptors. Some questions were taken from and/or modeled after questions from the Behavioral Risk Factor Surveillance System (BRFSS), a tool in the public domain (CDC, 2010d). Some demographic questions allowed for the control of factors such as marital status or age, and other demographic questions were related to obesity (sleep, health status, weight, physical activity, waist size) and sources of stress and coping (complexity of responsibilities, alcohol intake).

Data Analysis

To test the mediated models (see Appendix M), separate analyses were run for each mediator (emotional eating and restrained eating) (Kenny, 2012): Step 1 determined if role stress was correlated with obesity. Obesity was the dependent variable in this regression equation and role stress the predictor. This step determined if there was an effect to be mediated. Step 2 investigated whether role stress was correlated with the mediator (either emotional or restrained eating). Therefore, either emotional or restrained eating was used as the dependent variable in the respective regression equation and role stress as a predictor. This step involved treating the mediator as if it were a dependent variable. Step 3 investigated whether the mediator (emotional or restrained eating) affected obesity. Obesity was used as the dependent variable in a regression equation and role stress and either emotional or restrained eating as predictors. This step controlled for role stress in establishing the effect of eating behavior on obesity. Step 4 finally established whether emotional and restrained eating completely mediated the role stress-obesity relation. The effect of role stress on obesity controlling for each eating behavior should be zero. Steps 3 and 4 were estimated in the same equation.

Demographic data was used to describe the study participants and to make within group and between group comparisons. In particular, it was hoped that data from non-White clergymen would be compared with that of White clergymen using an Independent sample *t* test to see if there were statistically significant between group differences in obesity. If such differences were found, data from both groups would have been analyzed and reported separately.

Chapter IV

Results

The purpose of this study was to examine the relation between the dependent variable obesity (BMI) and the independent variables role stress, emotional eating behavior, and restrained eating behavior. It was hypothesized that emotional eating behavior and restrained eating behavior would mediate the relations between role stress and obesity in congregational clergy. These relations were tested utilizing ordinary least squares regression (OLS) with data collected via an emailed survey from a random sample of LCMS congregational clergy in the US who had email addresses. Separate analyses were conducted for emotional and restrained eating behaviors.

Data Collection Results and Response Rates

The LCMS has approximately 5,200 ordained ministers serving as congregational clergy, and 4,047 LCMS clergy have email addresses. The Production/Quality Control Coordinator from the Office of Rosters/Statistics at LCMS first sorted these 4,047 email addresses by Church Worker ID number (a randomly assigned sequential number, not based on last name, or other personal characteristic); then randomly drew the specified sample (N = 1,272) using SPSS (version 16.1) random sample procedure. These records were exported to a separate file, converted to an Excel file, and sent to the researcher. This file included only the clergy email address and LCMS district, which was important to verify that this was a geographically representative sample of US LCMS clergy.

Dillman and colleagues (2009) *Total Design Method* was used to increase response rate. Four emails were sent at one week intervals to each email address: an introduction letter, a formal request, and two reminder notices. Due to daily outgoing

email limits set by gmail, 900 emails were first sent followed by 372 on the next day. The survey was open for a three week period from June 27 to July 17, 2011.

Dillman and colleagues (2009) note that the majority of responses for online surveys are received within the first 48 hours. In the present study, 43% of total responses (n = 220) were received within 48 hours. After one week, this number increased to 277 (54% of total responses). After the first reminder, 417 were received (82% of total responses), and after the second reminder, the final total was 508 responses. This represents a 39.9% overall response rate for returned surveys.

There were 87 problems with delayed/failed delivery after the first emailed notice; however, some were ultimately delivered. This number varied for each emailed notice. Five clergy requested to "unsubscribe," however, one of these noted that he recently retired. Three clergy emailed to report difficulty in accessing the survey. This may have been due to the clergyperson opening the survey to look at it on one occasion, and then returning on a second occasion to complete the survey. Although IP addresses were not collected, the survey was set to allow only one submission per IP address. Suggestions were sent to these clergy to clear their browsing history and re-try, however it is not known if this suggestion was helpful or not.

Of the 508 responses, 20 surveys were completely blank, and two mostly blank. Therefore, the survey was completed by 486 clergy, a 38% response rate. Thirteen of these respondents had missing data on study delimitations: history of weight loss surgery or anorexia or bulimia, marital status, and if working in US. In addition, 41 respondents did not meet the study inclusion criteria including three who did not meet more than one criterion. These 54 respondents (see Table 1) were excluded leaving 432 respondents.

Table 1

Cases excluded due to study variables (N = 54).

Criterion	Not Met	Missing data
Married	28	1
Minimum Master's degree	12	2
Working in US	1	1
No history anorexia or bulimia	1	5
No history weight loss surgery	2	4

Note: Three respondents had overlapping criterion.

Attention then turned to missing data on study variables. Two respondents did not note their weight and were excluded because weight is critical to BMI calculation. Concerning role stress, 6 of the 14 questions had no missing data and the largest amount of missing data ($n = 8$) was on question 7, "I know that I have divided my time properly." There were four missing responses on question 9, three on question 3, two on questions 6, 10, and 12, and one on question 13. Missing responses represent 0.4% of role stress data.

Considering emotional eating, six clergy missed one question each and one missed this entire scale. Missing responses represents 0.3% of data. Concerning restrained eating, six clergy missed one question each, and one missed this entire scale. Missing responses represents 0.4% of data. Missing data totals on role stress and eating behaviors represent less than 2% of the data. These values were substituted with means as recommended by Tabachnick and Fidell (2007) when missing data points total < 5%. Notably, there were no differences in analyses run with and without these cases.

Exclusion of the two respondents who did not provide their weight, left 430 of the participants who completed the survey, were members of the intended sample, and met

the study criteria: married, working as US congregational clergy, master's degree or higher, and no history of anorexia, bulimia, or weight loss surgery. Notably, 120 did not click on the consent button. However, participants were also asked to "click continue" to indicate consent and thus their completion of the survey was considered tacit consent.

Sample Characteristics

Mean age was 51 years (*SD* = 11) (see Table 2). All were married, and 56.7% did not have children aged ≤ 18 years living at home. This sample was predominantly White (98.8%) with few Hispanic/Latino (*n* = 3), American Indian or Alaska Native (and White) (*n* = 4), Asian (*n* = 2), Black or African American (*n* = 1), and Native Hawaiian or Other Pacific Islander (*n* = 0). All had at least a master's degree, 12.3% were currently studying for a doctoral degree, and 6% had a doctoral degree.

Regarding the clergy role, the majority (79.2%) worked as a sole pastor, and only 10.2% served more than one congregation. Of the 20.8% who were not sole pastors, 14.4% were Senior, 5.3% were Associates, and 1.2% Assistant pastors; 54.7% had a job description. Very few (2.8%) taught at a college/university, and 34.4% had responsibility for a church-based school. About one third (37.4%) had one or more deacons, lay ministers, or youth workers working with them. Congregations ranged from ≤ 50 to ≥ 500 members, with the majority (63.2%) serving > 200 members (see Table 2). Seventy-two percent reported attendance of ≤ 200 parishioners at weekly services. Almost half (47.9%) had individual income of $25,000. - $50,000 (see Table 2), 64% received an additional housing stipend and 31% reported an official clergy residence.

Table 2

Demographic Characteristics (N = 430).

Demographic characteristic	Percent	*n*
Age group		
26 – 29 years	2.3%	10
30 – 39 years	15.1%	65
40 – 49 years	20.5%	88
50 – 59 years	35.1%	151
60 – 69 years	24.2%	104
70 – 79 years	2.8%	12
Income (without housing stipend)		
< $25,000.	4.0%	17
$25,000. - $50,000.	47.2%	203
$50,000. - $75,000.	36.0%	155
$75,000. - $100,000.	9.5%	41
> $100,000.	2.8%	12
Missing	0.5%	2
Congregations size		
< 50 members	2.3%	10
50 – 99 members	9.1%	39
100 – 199 members	25.3%	109
200 – 499 members	37.4%	161
500 or more	25.8%	111

The majority (52.8%) went to seminary right after college, and 81.4% became a congregational clergyman right after seminary. Mean years working as a congregational clergy was 19 years (*SD* = 11). Finally, in a comparison of the sample (*N* = 430) to the randomized sample (*N* = 1,272) of surveys sent, it was found that the sample accurately represents LCMS clergy in all regions of the US (see Table 3). This was confirmed by Chi-square analysis of the regions of the delimited sample ($_X^2$ = 2.566, *df* = 3, *p* = 0.46).

Table 3

Comparison of delimited sample (*N* = 430) to randomized sample (*N* = 1,272).

Location	Percent Randomized sample (*N* = 1,272)	Percent Response sample (*N* = 430)
Northeast	7.1%	8.6%
Midwest	53.8%	54.9%
South	21.2%	19.1%
West	17.9%	17.4%

Psychometric Evaluation of the Instruments

Role Conflict and Ambiguity Scales (RCAS). The RCAS (Rizzo, House, & Lirtzman, 1970) is a 14-item, seven-point scale (Definitely not true/Extremely true) that measures role stress, and is composed of eight role conflict and six role ambiguity questions. Role ambiguity questions are reverse scored. High scores indicate high levels of role stress. Scores may range from 14 to 98, and in this study ranged from 15 to 81. Cronbach's alpha (Nunnally & Bernstein, 1994), a measure of internal consistency, was .85 for this study and squared multiple correlations ranged from .25 to .58.

Dutch Eating Behaviour Questionnaire (DEBQ). Two scales of the DEBQ (Van Strien, Frijters, Bergers et al., 1986) were used in this study. A 13 item, five-point

(never/very often) scale that measures emotional eating, and a 10 item, five-point (never/very often) scale that measures restrained eating behavior. Scores are divided by the number of items on the respective scale, and a high score indicates a high tendency for that eating behavior. Scores may range from 1.00 to 5.00 on each scale, and in this study ranged from 1.00 to 4.69 (M = 2.28) on emotional eating behavior, and 1.00 to 5.00 (M = 2.83) for restrained eating behavior. For the emotional eating scale in this study, Cronbach's alpha (Nunnally & Bernstein, 1994) was .96, and squared multiple correlations ranged from .51 to .79. For the restrained eating scale in this study, Cronbach's alpha was .87, and squared multiple correlations ranged from .26 to .61. Psychometric properties of the major study variables are shown in Table 4. The Cronbach's alpha values for the study scales are .85, .96, and .87 respectively. As these values are all above .70, the Cronbach's alpha for these scales is acceptable (Nunnally & Bernstein, 1994).

Table 4

Psychometric Properties of the Major Study Variables (N = 430)

Variable	*M*	*SD*	Range
Role Stress	46.60	11.50	15.00 – 81.00
Emotional Eating	2.28	0.80	1.00 – 4.69
Restrained Eating	2.83	0.66	1.00 – 5.00
BMI	29.43	5.46	19.85 – 52.36
BMI (Grouped)		1.05	Groups 1 - 5

BMI. BMI (M = 29.43) was divided into six groups (see Table 5). Only 18.6% reported a normal weight (BMI 18.50 – 24.99) and none were underweight. Therefore,

44.7% were overweight (BMI 25 – 29.99) and 36.7% were obese (BMI ≥ 30), for a total of 81.4% either overweight or obese.

Table 5

BMI Classifications (N = 430).

Classification	BMI	Group	Percent	Frequency
Underweight	< 18.50	0	0	0
Normal weight	18.50 – 24.99	1	18.60	80
Overweight	25.00 – 29.99	2	44.7	192
Obese I	30.00 – 34.99	3	22.60	97
Obese II	35.00 – 39.99	4	8.8	38
Obese III	≥ 40.00	5	5.3	23

Crosstabs/chi-square analysis revealed no statistically significant difference ($_X^2$ = 8.96, df = 12, p = .71) in BMI groups by region. Obesity was operationalized as BMI group in this study, and obesity was highest in the Midwest (39.8%) (See Table 6).

Table 6

Percentage of normal weight, overweight, and obese by region (N = 430).

Region	% Normal weight	% Overweight	% Obese
Northeast	13.5%	56.8%	29.7%
Midwest	16.6%	43.6%	39.8%
South	19.5%	47.6%	32.9%
West	26.6%	38.7%	34.7%

Main Analysis

Main analysis examined relations between the dependent variable obesity (BMI) and the independent variables: role stress, emotional eating behavior, and restrained eating behavior. Data were received as an spss.sav file from SurveyMonkey and PASW18 (2011) statistical software was used for analysis. Data were reviewed for accuracy of entry and the assumptions of regression analysis as outlined by Tabachnick and Fidell (2007). It was previously identified that a sample of 159 was needed based on recommendations from Fritz and MacKinnon (2007) for a Test of Joint Significance of Paths *a* and *b* in a mediation model with a small to medium effect size.

Screening for univariate outliers was performed by analysis of boxplots and z-scores > 3.3. All z-scores for all outliers were $\leq \pm 3.2$, and the most extreme of these cases were not far from other data points on boxplots. Screening for multivariate outliers was then performed by analysis of residual scatterplots in SPSS Regression, casewise diagnostics for standardized residuals (> 3.3), Mahalanobis distance (> 10.828), and Cook's distance (>1.00). Separate analyses were performed for each proposed regression equation: (a) BMI Group regressed on role stress, (b) emotional eating behavior regressed on role stress, (c) restrained eating behavior regressed on role stress, (d) BMI Group regressed on emotional eating behavior, (e) BMI group regressed on restrained eating behavior, (f) BMI Group regressed on role stress and emotional eating behavior together, and (g) BMI Group regressed on role stress and restrained eating together. In all, seven regression equations were examined, and only one multivariate outlier (case #20) was identified in one regression equation (emotional eating behavior regressed on role stress).

Residual scatterplots were rectangularly distributed, with a concentration of scores at the center, indicating good normality, linearity, and homoscedasticity (Tabachnick & Fidell, 2007) and notably case 20 was not far from other cases in these scatterplots. Standardized residuals (z-scores > 3.3) were then inspected. A residual is the difference between the predicted and obtained values, and is a measure of error of prediction (Tabachnick & Fidell). Case #20 with a z-score of 3.42 was further evaluated.

Mahalanobis distance is "the distance of a case from the centroid of the remaining cases where the centroid is the point created at the intersection of the means of all the variables" (Tabachnick & Fidell, 2007, p. 74). To determine values with high Mahalanobis distance, the number of IV's are specified (i.e., emotional eating and role stress), and these are equal to the degrees of freedom. Critical X^2 at alpha = .0001 is 10.828 for one IV, and no cases were identified with high Mahalanobis distance.

Leverage is described as how far a case is from others, and therefore how influential it may be. However, it is important to view whether a case with high leverage is in line with other cases (low discrepancy) or away from other cases (high discrepancy). Leverage values were low (i.e. range = 0.00 - 0.03) for all regression equations, and although case #20 was identified as an outlier, its highest leverage value is .03 and it is in line with other cases, indicating that this case is not very influential.

Cook's distance is also a measure of influence. Values reflect changes in residuals if a case were deleted, with high scores (> 1.00) indicating outliers (Tabachnick & Fidell, 2007). Cook's distance for all cases was low (range = 0.00 - 0.05) across all regression equations. For case #20, Cook's distance also remained low in each regression equation (range = 0.00087 – 0.001), indicating that it was not influential. In

an effort to further understand why case #20 was a univariate and multivariate outlier; scores on each variable were examined. This participant had the highest score for emotional eating behavior (4.69), a BMI of 31.26 (Group 3, Obese I), a moderate score for restrained eating behavior (2.20), but a low score for role stress (37.00). However, regression equations do not change significantly when this case is removed. This case was judged to belong to the target population and was not removed from the data set.

Examination of skewness and kurtosis was performed to assess for normality (see Table 7). Fisher's measures of skewness (skewness/S.E. skewness), an evaluation of symmetry of the distribution, was > 2 for role stress (2.50), emotional eating behavior (3.64), and BMI Group (6.50). Positive skewness indicates a pile up of cases on the left and a long tail on the right. This is illustrated in BMI Group, which has no cases in the underweight group, the largest number of cases in the overweight group (group 2), and a long tail of cases in the three obese groups (see Table 7). Only restrained eating behavior was (slightly) negatively skewed, having a pile up of cases to the right and a longer tail to the left, and Fisher's measure was < 2 for this variable.

Table 7

Evaluation of skewness for study variables (N = 430).

Variable	Skewness	Std. Error of Skewness	Fisher's Measure of Skewness
BMI Group	.768	.118	6.51*
Role Stress	.295	.118	2.50
Emotional Eating	.430	.118	3.64
Restrained Eating	-.107	.118	0.91

*Indicates values that are high and therefore statistically significant.

Consideration was given to square root transformation of BMI Group, and this resulted in a Fisher's skewness value of 2.26. Also considered was utilizing a new BMI classification system from the World Health Organization (WHO), which would have distributed the cases more evenly. However, both of these options posed potential difficulties for interpretation and comparison of data, therefore a decision was made to use the original un-transformed BMI Group in these analyses. Additionally, bootstrapping analyses of the mediation model was used to verify mediation results as normality of data is not a requirement for this test.

Kurtosis, the peakedness of the distribution curve for each variable, was then examined. Tabachnick and Fidell (2007) note that the expected value for kurtosis is zero for all statistical packages. Kurtosis values for all variables are close to zero: role stress (.178), emotional eating behavior (-.004), restrained eating behavior (-.297), and BMI group (.273). Therefore the distributions for these variables are mesokurtic (normal), indicating a normal variance of scores (Waltz, Strickland, & Lenz, 2005).

Tolerance values were next examined for evidence of multicollinearity and singularity. Because tolerance (0 - 1.00) is the proportion of variance in a variable that is not accounted for by other independent variables, high tolerance values are desired and a tolerance value of 0 would signal perfect multicollinearity (Tabachnick & Fidell, 2007). Tolerance for variables role stress and emotional eating behavior is .91, and for variables role stress and restrained eating behavior is 1.00, which are excellent.

Research Questions

The research questions follow Baron and Kenny's (1986) mediated model. This model specifies the use of Ordinary Least Squares regression (OLS) equations to test the

mediation effect of one of the independent variables, in this case eating behaviors. Baron and Kenny describe the mediation process whereby one variable acts as a mediator when it "accounts for the relation between the predictor and the criterion" (p. 1176). They describe a causal chain of regression equations, and four steps that are required to establish that mediation exists (Baron & Kenny, 1986; Judd & Kenny, 1981):

1. Demonstrate that the initial variable (*Role Stress*) is correlated with the outcome variable (*Obesity*). This step establishes that a significant effect to be mediated exists. This is Path c, the total effect. Recently, Kenny (2012) noted that this step is not required, and therefore need not be statistically significant.
2. Demonstrate that the initial variable (*Role Stress*) is correlated with the mediator (*Eating Behaviors*). In this second equation, Role Stress is the predictor variable and Eating Behavior is the criterion variable. This is Path *a*, and there must be a significant effect in this equation.
3. Demonstrate that the mediator (*Eating Behavior*) affects the outcome variable (*Obesity*). In this third equation, both the initial variable (*Role Stress*) and the mediating variable (*Eating Behavior*) are entered together as the predictor variables, and the outcome variable (*Obesity*) is the criterion variable. If mediation exists, the Role Stress becomes insignificant, and only the mediator (*Eating Behavior*) remains significant, demonstrating that the mediator controls Role Stress. Path b is the effect of the mediator (*Eating Behavior*) on Obesity, and path *c´* is the effect of Role Stress on Obesity.

4. Demonstrate that the mediator (*Eating Behavior*) completely mediates the relation between Role Stress and Obesity. When the mediator is entered into the regression equation with X and Y, the effect of X on Y should be zero to demonstrate full mediation, and significantly reduced to demonstrate partial mediation (Path *c´*). Mediation is the indirect effect, where the mediator indirectly affects the relation between the independent variable and the dependent variable. The following equation is used: *c* = *c´* + (*ab*) with unstandardized regression coefficients (β) from the above regression equations. The mediation equation may also be written as: total effect = direct effect + indirect effect. Because steps two and three must be true to examine the model for mediation, correlations between all study variables were examined first (see Table 8 and Figure 1).

Table 8

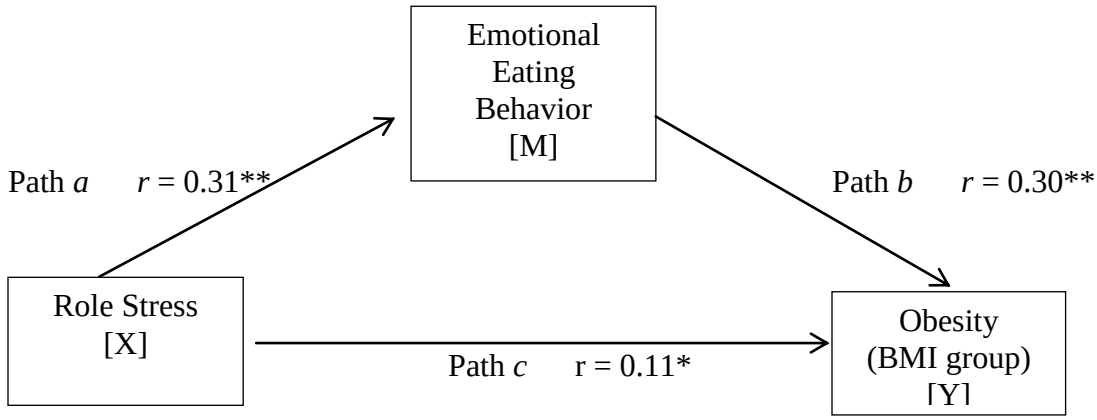
Pearson product-moment correlations for study variables.

Variable	BMI Group	Role Stress	Emotional Eating	Restrained Eating
BMI Group	-			.30**
Role Stress	.11*	-		
Emotional Eating	.30**	.31**	-	
Restrained Eating	.15**	.01	.18**	

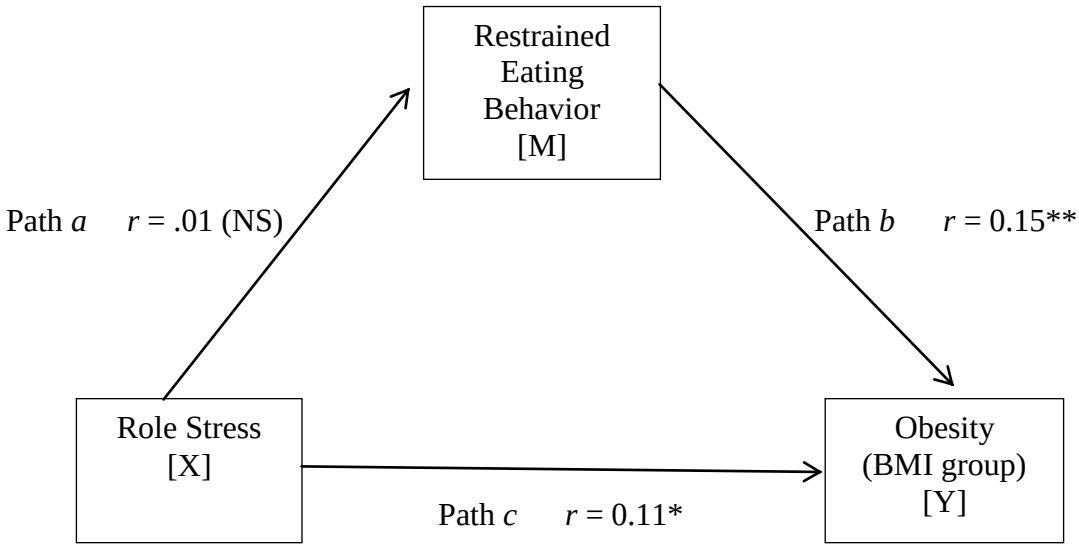
Note: ** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Figure 1

Path diagram of correlations between study variables.



Note:
** Correlation is significant at the .000 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed)



Note:
** Correlation is significant at the 0.000 level (2-tailed).
* Correlation is significant at the 0.05 level (2 tailed).
NS – Non-significant

Research question one asked: "Does role stress contribute to explained variance in obesity in congregational clergy?" The first regression equation is used to demonstrate the total effect of role stress on BMI Group. Role stress does contribute to explained obesity variance in clergy, but accounts for only 1% of the variance. This relation is significant (β = .01, p = .018) and confidence intervals do not cross over zero (95% *CI* for β [.002, .019]), another sign of significance (see Table 9). This first regression equation represents Path c of the mediated model and demonstrates that there is an effect to be mediated, albeit a very small one. Step 1 (see above) has been passed.

Table 9

Regression of BMI Group on Role Stress (N = 430)

Variable	β	*SE* β	Beta	*t*	Sig. *t*
Role Stress	.01	.004	.114	2.38	.018

F = 5.66 (1, 428)

Sig. F = .018

Multiple R = .11

R Square = .013

Research question two asked: "Does role stress contribute to explained variance in eating behavior (emotional and restrained) in congregational clergy?" A significant relation exists between role stress and emotional eating (β = .02, p = .000). This is also demonstrated by confidence intervals for β (95% *CI* [0.015, 0.027]), that do not cross over zero. In this study, role stress explains 9% of variance in emotional eating (see Table 10). This is Path *a* of the mediated model, and must be significant for a mediated effect to be demonstrated (Kenny, 2012). Step 2 has been passed for emotional eating.

Table 10

Regression of Emotional Eating Behavior on Role Stress (N = 430).

Variable	β	SE β	Beta	*t*	Sig. t
Role Stress	.021	.003	.305	6.63	.000

$F = 43.93$ (1, 428)

Sig. $F = .000$

Multiple $R = .31$

R Square = .09

The relation between role stress and restrained eating is not significant (β = .001, $p = .81$) (see Table 11). Additionally, confidence intervals cross over zero (95% *CI*, [-.005, .006]), further demonstrating a lack of significance. This relation represents Path *a* of the mediated model and must be significant for restrained eating to be a mediator. Therefore, step 2 has not been passed for restrained eating and it is not possible for restrained eating to mediate the relation between role stress and obesity.

Table 11

Regression of Restrained Eating Behavior on Role Stress ($N = 430$).

Variable	β	SE β	Beta	*T*	Sig. *T*
Role Stress	.001	.003	.012	.244	.807

$F = 0.06$ (1, 428)

Sig. $F = .807$

Multiple $R = .01$

R Square = .000

Research question three asked: "Does eating behavior (emotional and restrained) affect the relation between role stress and obesity in congregational clergy?" As noted Path *a* for restrained eating and role stress is not significant so mediation may not be considered (Kenny, 2012). However, because Path *a* is significant for emotional eating and role stress, emotional eating was examined as a mediator.

BMI group was regressed on role stress (Path *c´*) (β = .002, *p* = .597 [95%*CI*, -.006, .011]) and emotional eating (Path *b*) (β = .384, *p* = .000 [95% *CI*, .258, .510]) (see Table 12). To demonstrate mediation, the effect of emotional eating added as a second independent variable to a previously examined regression equation between BMI group and role stress (Path *c*) was examined. Mediation is demonstrated if Path *b* (BMI group and emotional eating) is significant, and Path c´ (BMI group and role stress) is not significant and is either zero or substantially reduced by addition of the mediator. As Path *b* is significant, and Path *c´* is reduced, mediation exists. Additionally, reliability of the mediator (emotional eating scale) was ideal at .96 (Frazier, Tix, & Barron, 2004).

Table 12

Regression of BMI Group on Role Stress and Emotional Eating (EE) (*N* = 430).

Variable	β	95% CI	*SE* β	Beta	*t*	Sig. t
Role Stress	.002	-.006, .011	.004	.03	.529	.597
EE	.384	.258, .510	.064	.29	5.99	.000

F = 20.98 (2, 427, 429)

Sig. *F* = .000

Multiple *R* = .30

R Square = .09

Research question four asked: "Does eating behavior (emotional and restrained) completely mediate the relationship between role stress and obesity in congregational clergy?" The a priori test of mediation for this analysis is the Test of Joint Significance, which is demonstrated by examining the unstandardized coefficients for Paths *a* and *b*. If both of these paths are significant, then mediation exists (Cohen & Cohen, 1983, p.366, Kenny et al., 1998). As stated above, it is not possible for restrained eating behavior to mediate the relations between obesity and role stress in clergy as Path *a* is not significant, therefore this relation was not examined.

Regarding emotional eating behavior, significant relations do exist between emotional eating behavior and role stress ($\beta = .02$, $p = .000$, [95% *CI* [0.015, 0.027]) (Path *a* - α) and BMI group and emotional eating behavior ($\beta = .384$, $p = .000$ [95% *CI*, .258, .510]) (Path *b* - β). Therefore, The Test of Joint Significance indicates that mediation is present, and as $\alpha \neq 0$ and $\beta \neq 0$, there is a significant indirect effect.

Complete mediation exists when the mediator is added to a regression equation, and the relations between the dependent variable and independent variable is reduced to (or near) zero. When role stress and emotional eating are entered into the regression equation together as predictors, and BMI as the criterion variable, the relation between role stress and BMI became non- significant as compared to when role stress entered the equation alone. The relation decreased from $\beta = .010$, $p = .018$ to $\beta = .002$, $p = .597$.

This mediation model was further tested with bootstrapping as recommended by Kenny (2012) and others (Hayes, 2009; Shrout & Bolger, 2002). Krause et al. (2010) describe bootstrapping as a powerful test of mediation, as do others (Fritz & MacKinnon, 2007; Hayes, 2009; Zhao, Lynch, & Chen, 2009). Additionally, Preacher and Hayes

(2008a) note that bootstrapping does not "impose the assumption of normality of the sampling distribution" (p.880). As there remains a positive skew in the BMI variable, utilizing this test provides reassurance that the results are not a result of error.

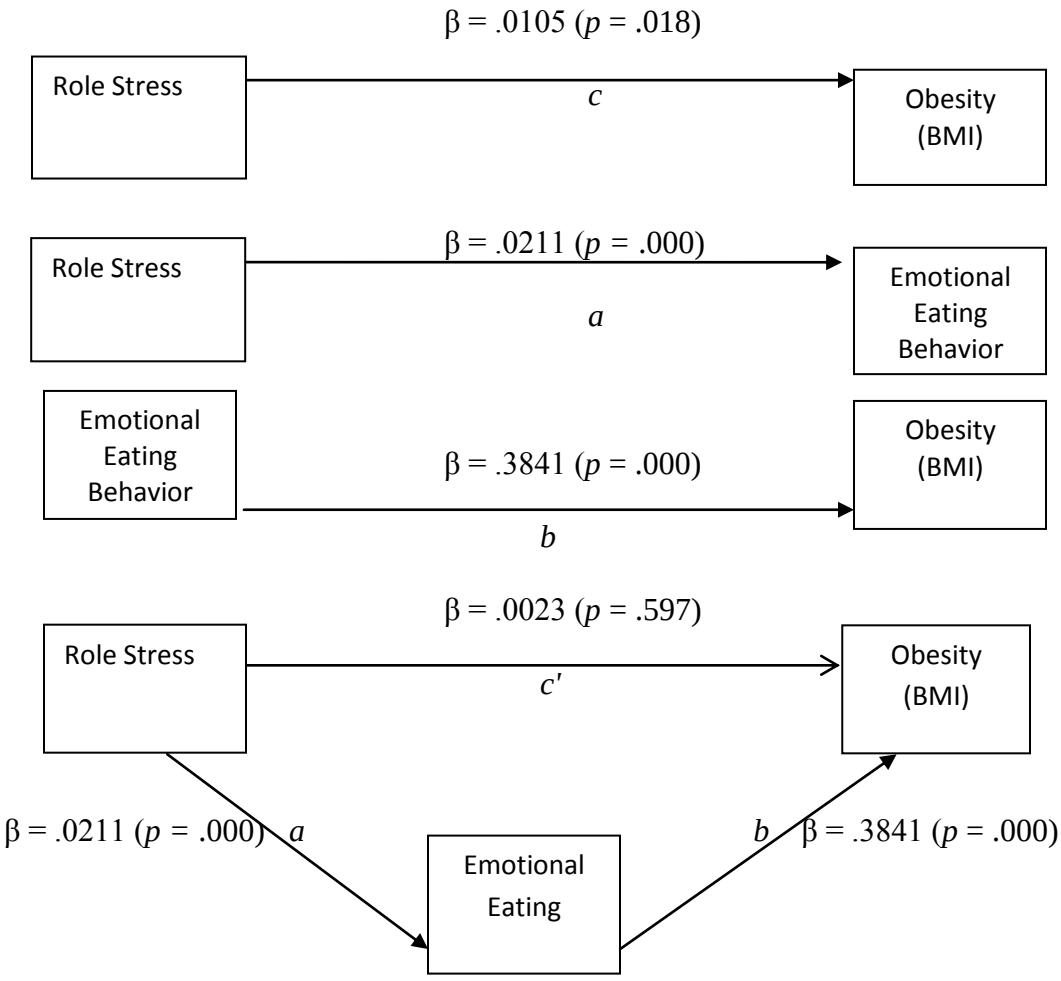
Bootstrapping is a non-parametric statistical method that allows for an a priori number of repetitions of a regression analysis using resampling with replacement (Efron & Tibshirani, 1993). The indirect effect is computed with each repetition, and a sampling distribution is empirically generated, however a bias correction is necessary as the mean of the bootstrapped distribution will not exactly equal the indirect effect (Kenny, 2012).

Hayes' Macro for Mediation, which is used with SPSS (PASW 18), provides coefficients, standard error, *t*, and *p* values for the independent, mediator, and dependent variables in the regression equations (Preacher & Hayes, 2008b). Provided also are a model summary, indirect effects of the IV on DV through the mediator (path *a*b*), Z score, and bias corrected and accelerated confidence intervals. The researcher sets the re-sampling repetitions, and inputs the dependent and independent variables.

Hayes (2009) recommends using at least 5000 re-sampling repetitions, and in this model, bootstrapping was repeated at 5,000 and 10,000 re-sampling repetitions, and results were very similar. At 10,000 re-sampling repetitions, the indirect effect (*a*b*) was significant ($p > .0001$), the bias corrected and accelerated confidence intervals did not cross over zero (95% *CI*, .0049, .0122), and the Z score was > 1.96 (4.45). Therefore a significant indirect effect was demonstrated (see Table 13).

Table 13

Bootstrapping results of testing the meditation model with emotional eating behavior.



Direct effect = .0023 (p = .597)

Indirect effect (a*b) = .0081 (95% *CI* [.0049, .0122]) (Bias corrected and accelerated)

Total effect = .0104 ($c´ + ab$)

(c = .0105, p = .018)

Model Summary: F = 20.98 (2, 427)

Sig. F = .000

R Square = .09

Adjusted R Square = .09

Table 13 continued

Normal theory test for indirect effects:

	Effect	*SE*	*Z*	*p*
Emotional Eating	.0081	.0018	4.4506	.0000

Bootstrap results for indirect effect:

	95% *CI**	Data	Boot	Bias	*SE*
Emotional Eating	.0049, .0122	.0081	.0081	.0000	.0019

Note: * *CI* Bias corrected and accelerated

The formula "total effect = direct effect + indirect effect" ($c = c´ + a*b$), is used to evaluate the mediation model, and may also be thought of as "indirect effect = total effect – direct effect" ($a*b = c - c´$), as Kenny (2012) describes that the indirect effect equals the reduction of the effect of the initial independent variable on the outcome. As these formulas result in approximately balanced equations, the results of this analysis are valid.

Calculations: $c = c´ + ab$

$c = 0.0105 = c´ + a*b = .0023 + .0211 \text{ x } .3841 = 0.0104$

Calculations: $a*b = c - c´$

$a*b = .0023 \text{ x } .0211 = .0081045 = c - c´ = .0105 - .0023 = .0082$

The amount of mediation is measured by the indirect effect, which is $a*b$, and is not a measurement of the reduction of significance or the change in variance (Kenny, 2012). The proportion mediated may be summarized with a single value ($ab/[c´ + ab]$) (Alwin & Hauser, 1975; Sobel, 1982). Although this value may be unstable (MacKinnon, Warsi, & Dwyer, 1995) and therefore some suggest it does not carry much

weight (Gelfand, Mensinger, & Tenhave, 2009) it is used to succinctly summarize the results of a mediation analysis. In this case, the proportion mediated is 78%.

Calculation: $ab/[c´ + a*b]$

(.0211 x .3841) / .0023 + (.0211 x .3841)

.0081045 / .0023 + .0081045

.0081045 / .0104045 = .7789418

Similarly, Kenny (2012) suggests reporting the proportion mediated as well, utilizing a different formula (*ab/c*) and the resulting proportion mediated is 77%.

Calculation: *ab/c*

(.0211 x .3841) / .0105

.0081045 / .0105 = .7718571

Kenny (2012) further notes that in order to claim complete mediation, the percent mediated should be at least 80%. However, Kenny also states that this value is unstable when standardized *c* is small, and suggests that standardized *c* (Beta value for path *c*) must be ± .2 in order to use this formula. In this case, standardized *c*, the correlation between role stress and BMI is less than .2 (Beta = .114).

Fritz and MacKinnon (2007) note that when Bias-corrected bootstrap analysis is utilized, if path *a* is .31 and path *b* is .30 (standardized values in this study); the sample size needed for .8 power is 148. As this sample size is 430, it is adequate for the power analysis. (A sample size of 159 was needed for the Test of Joint Significance.)

Power analysis in mediation is a topic of discussion at the present time. Kenny (2012) states that there "does not currently exist a computer program that can be used to compute the power of the test of the indirect effect" (p. 6). The indirect effect is calculated from the product of the beta values for paths *a* (.31) and *b* (.30), which is .093.

In this case the effect size is medium (.09) (Cohen, 1988). This is consistent with the anticipated effect size. Additionally, as the standardized values for paths *a* and *b* are comparable in size, this too contributes power to the mediated relations (Kenny, 2012).

In mediation analysis, power is also influenced by tests used for statistical analysis, and bootstrapping is highly regarded as a powerful test of mediation (Fritz & MacKinnon, 2007; Krause et al., 2010; Hayes 2009; Zhao, et al., 2009). The reliability of the mediator may also strengthen the research findings (Frazier et al., 2004). In this case the reliability of the mediator (DEBQ – emotional eating behavior scale) was > .90 (.96), and is therefore ideal.

In conclusion, emotional eating appears to partially mediate the relations between role stress and obesity. Although the percent mediated appears to be 77 – 78%, it is difficult to assess due to the low value of standardized c (role stress and obesity). However, as the 95% confidence intervals do not cross over zero (95% *CI* [.0049, .0122]), the *Z* score is > 1.96 (4.45); and the indirect effect ($a*b$ = .0081, $p < .0001$) is significant; these findings are significant. Additionally, power and statistical analyses provide support and strength to these findings.

Additional Analysis

Comparison of clergy obesity to US population. In order to determine if this sample's overweight and obesity status was statistically significantly different from non-Hispanic White males' ≥ 20 years, in the general US population, as reported by the CDC (2010a), one-sample Chi-square analyses using GraphPad software (2012) were conducted. Overweight and obesity rates are often reported as two categories: overweight/obese (BMI ≥ 25) and obese (BMI ≥ 30), therefore these categories were

used. With alpha set at .05, it was found that this sample's clergy did have statistically significantly higher overweight/obesity (81.4% vs. 72.6%) and obesity (36.7% vs. 31.9%) rate than non-Hispanic White males ≥ 20 years in the general US population ($X^2 = 16.95$, $df = 2$, $p = .0002$).

Comparison of obesity in LCMS clergy to other clergy. Again, using one sample Chi Square analysis with alpha set at .05, overweight/obesity rates of LCMS clergy were also compared to overweight/obesity rates reported in the other, formerly cited, clergy studies. LCMS clergy (overweight/obese 81.4%, obese 36.7%) had higher rates of obesity than clergy of varied religions and denominations (Carroll et al., 2001) (overweight/obese 74.9%, obese 28.9%; $X^2 = 16.55$, $df = 2$, $p = 0.0003$), and ELCA clergy (Halaas, 2002) (overweight/obese 72%, obese 34%; $X^2 = 19.51$, $df = 2$, $p = 0.0001$). In comparison to the most recent study of UMC clergy in North Carolina (Proeschold-Bell & LeGrand, 2010) LCMS clergy had slightly higher rates of overweight/obesity, and slightly lower rates of obesity (overweight/obese 77.5%, obese 39.7%; ($X^2 = 9.19$, $df = 2$, $p = 0.01$). However, the mean BMI of LCMS clergy ($M = 29.43$, $SD = 5$) and UMC clergy ($M = 29.46$, $SD = 6.06$) are essentially the same.

Clergy role stressors. The present study proposed that clergy are exposed to unique role stressors that result in role stress and, in response to this role stress, clergy engage in emotional and restrained eating behaviors, which leads to obesity. Given the noted overweight/obesity incidence in this sample, additional analyses focused on the contribution of clergy role stressors to experienced role stress. Role stressors cited in the literature include: lack of social and emotional support, low income, anxiety about personal finances, low housing satisfaction, congregation size, low numbers of weekly

congregants, no job description, responsibility for a school, age, lack of seniority, additional teaching at a college or university, overseeing lay church workers, and having church responsibilities in the evening (Hoge & Wenger, 2005; Meek et al., 2003; Proeschold-Bell & LeGrand, 2010; Verdieck, Shields, & Hoge, 1988; Virginia, 1998). Additionally, socializing with congregants was identified as a major role stressor by a clergyman with whom this study was discussed (R. Hesse, personal communication, February 1, 2011).

Questions from the Behavioral Risk Factor Surveillance System (BRFSS) and demographic questions were used to identify and examine clergy stressors, coping behaviors, and diet and activity patterns in this sample. Because of the exploratory nature of this analysis, bivariate Pearson correlations (alpha set at .05) were first run to investigate the relations between these role stressors and role stress, and also the intercorrelations amongst these role stressors. Lack of social support from family and friends is most highly correlated with high role stress (r = - .41, p < .0001). Lack of emotional support, or being able to express one's inner feelings, is also moderately correlated with higher role stress (r = - .36, p < .0001), as was stress/anxiety about personal finances (r = .31, p < .0001). Lower but statistically significant correlations were found between role stress and younger age (r = - .15, p = .001), less seniority (r = - .14, p = .004), and lower income (r = - .11, p = .03).

Regarding stressors unique to the clergy role, only lack of satisfaction with housing (r = - .23, p < .0001); and a greater number of evenings worked on church related activities (r = .12, p = .01) were related to increased role stress. Interestingly, though working on church related activities in the evenings increased role stress (r = .12,

$p = .01$), socializing with congregants unrelated to church business had the opposite effect ($r = -.18$, $p < .0001$). Finally, responsibility for a school, teaching college in addition to being a congregational clergyman, number of weekly congregants, size of church membership, and overseeing lay church workers, had no statistically significant relations with role stress.

In order to build a preliminary model of role stressors contribution to clergy role stress, intercorrelations amongst these stressors were considered. For example, while social support is most highly correlated with role stress, as expected it is also correlated very highly with emotional support ($r = .71$, $p < .0001$). Also, social support is statistically significantly positively correlated with satisfaction with housing satisfaction ($r = .30$, $p < .0001$), increased socializing with congregants ($r = .18$, $p < .0001$), higher age ($r = .18$, $p < .0001$), more seniority ($r = .16$, $p = .001$), and higher income ($r = .16$, $p = .001$); and negatively correlated with financial anxiety ($r = -.29$, $p < .0001$), and greater number of evenings of church-related activities ($r = -.16$, $p = .001$). Therefore, it was recognized that given these intercorrelations, these variables shared a portion of the variance in role stress with social support.

To account for this shared variance, and lacking strong theory regarding which variable to portion the unique and shared variance to, a step wise regression was run. With alpha set at .05, role stress was regressed on the statistically significant variables (social support, emotional support, financial stress, income, evenings worked, job description, satisfaction with housing, age, seniority, and socializing with congregants). Results (see Table 14) showed that four (social support, financial stress, job description, and socializing with congregants) of the ten independent variables had sufficient unique

variance to enter the regression equation, and together explained a statistically significant 23% of the variance in role stress. Social support entered the regression equation first and accounted for 16% ($p < .0001$), followed by financial stress at 4% ($p < .0001$), not having a job description at 2.3% ($p < .0001$), and low frequency of socializing with congregants at 0.6% ($p = .04$). Thus, it is concluded that low social support is the main contributor to this model of clergy role stress.

Table 14

Predictors of role stress in clergy

Variable	β	*SE* β	Beta	*t*	Sig. *t*
Social support	-3.88	.564	-.316	-6.88	.000
Financial stress	2.34	.535	.198	4.38	.000
Job description	-3.95	1.002	-.170	-3.95	.000
Socializing with congregants	-0.80	.390	-.091	-2.06	.040

$F = 32.60$

Sig. $F = .000$

Multiple $R = .491$

R Square = .241

Adj. R Square = .234

Clergy and eating behaviors. As noted earlier, the present study proposed that eating behaviors would mediate the relations between role stress and obesity. In the present study, significant positive correlations were found between role stress and emotional eating behavior ($r = .31$, $p < .0001$), and emotional eating behavior and obesity ($r = .30$, $p < .0001$). Emotional eating behavior was found to mediate the relations

between role stress and obesity. In contrast, a smaller relation was found between restrained eating behavior and obesity ($r = .15$, $p < .0001$), and restrained eating behavior was unrelated to role stress ($r = .12$, $p = .81$). Therefore, unlike emotional eating behavior, restrained eating behavior did not mediate the relations between role stress and obesity, but does appear to be a factor associated with obesity.

As a follow-up, relations between emotional eating and restrained eating behavior were examined, and a low but statistically significant ($r = .18$, $p < .0001$) correlation was found between emotional eating and restrained eating behaviors. To investigate the effect of this intercorrelation on BMI, BMI group was regressed on these variables in stepwise regression. Emotional eating behavior entered first and explained 9% of variance ($p < .0001$) in BMI group. Restrained eating behavior entered the equation second, and added 1% to variance ($p = .03$) in BMI group. Therefore, it is important to note that emotional eating behavior has a stronger and more significant relation with obesity than restrained eating behavior.

Interaction between emotional and restrained eating behaviors. In order to understand this relation better, and because one can be both an emotional as well as a restrained eater (Macht, 2008; Wong et al., 2009), emotional and restrained eating behaviors were dichotomized (high/low) at their means (emotional eating $M = 2.28$; restrained eating $M = 2.83$), and the main and interaction effects of these eating behaviors on explained BMI groups variance was investigated. Initial results showed that the assumption of homogeneity of variance across groups was violated (Levene's test: $F = 3.90$, $df = 3,426$, $p = .009$). Thus the square root of BMI groups was used to correct the skewness of the BMI groups variable (Fisher's measure of skewness = 6.50 [skewness/S.

E. skewness]). After square root transformation, Levene's test was acceptable (F = 1.07, df = 3, 426, p = .36). Tests of main effects between BMI group and dichotomized eating behaviors, showed that the relations between BMI and emotional eating behavior were significant however, restrained eating behavior was non-significant (alpha = .05) (see Table 15). The interaction effect emotional eating*restrained eating behavior was significant. The effect of emotional eating provides 6% of variance, and the interaction between emotional eating and restrained eating adds an additional 3%, for a total of 9% of variance in BMI. Therefore, emotional eating, on its own, influences BMI.

The moderating effect of restrained eating is shown in Figure 2. When restrained behavior is high, there is little variation in BMI based on high/low emotional eating behavior. Yet when restrained behavior is low, BMI varies greatly based on high/low emotional eating. Therefore, restrained eating influences BMI only in the presence of emotional eating behavior, for example, when clergy are high emotional eaters and have low restrained behavior as well, BMI is at its highest.

Table 15

Tests of Between-Subjects Effects (N = 430)

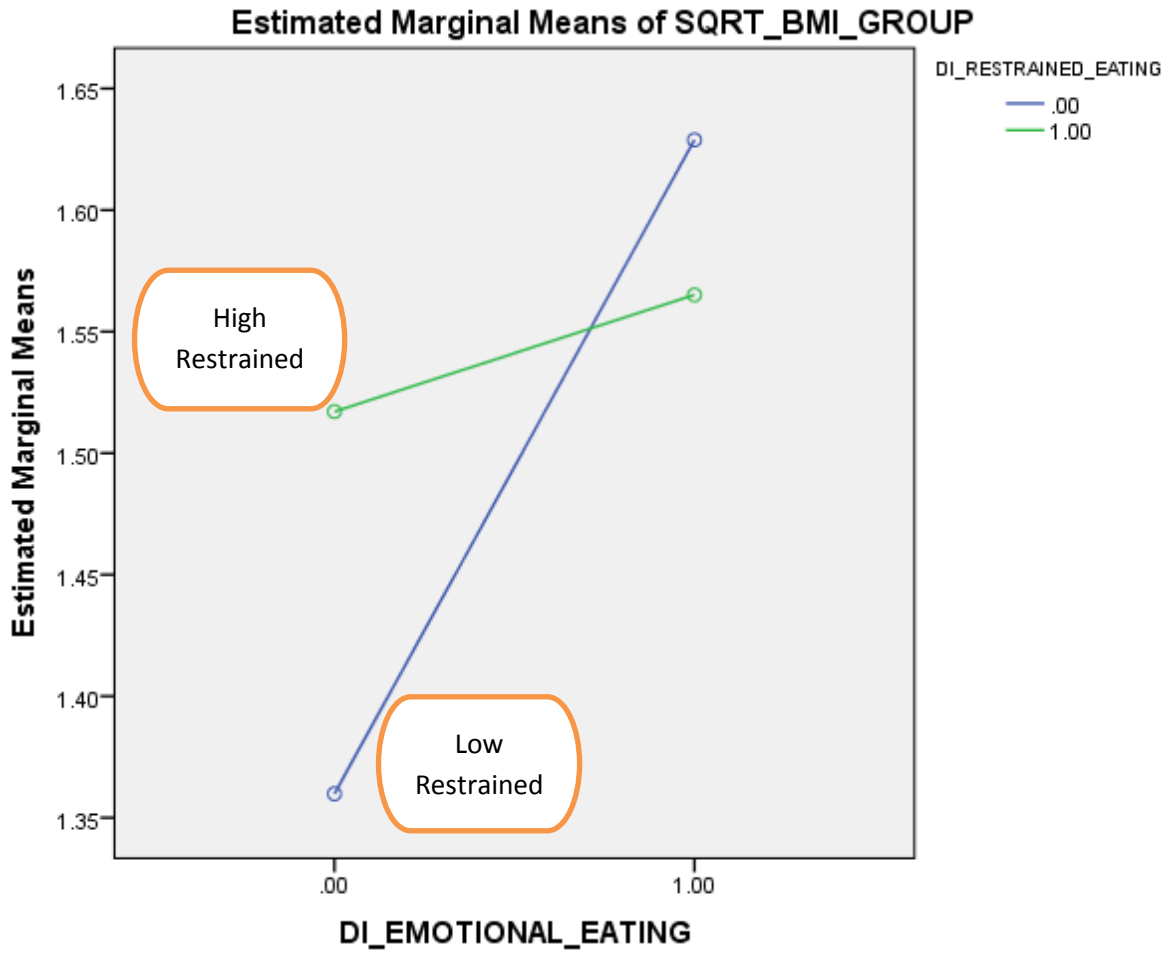
Dependent variable – Square root BMI Group

Variable	F	Sig.
Emotional Eating (high/low)	25.36	.000
Restrained Eating (high/low)	2.21	.138
Emotional*Restrained (high/low)	12.32	.000

R squared = 0.09

Figure 2

Interaction between emotional and restrained eating behavior with BMI.



Emotional eating behavior. Emotional eating behavior is described as eating in response to both diffuse and clearly labeled emotions and is considered a coping behavior (Bruch, 1964; Slochower, 1987), thus data were explored to investigate the relations amongst emotional eating and other coping behaviors using bivariate Pearson correlations (alpha set at .05). Specifically, though low social and emotional support can lead to role stress, high social and emotional support can help one cope with role stress once it is present. Thus support can be both a role stressor and a coping mechanism. Other coping behaviors include sleep and eating a diet high in densely caloric foods (thus low in fruits

and vegetables) (Konttinen et al., 2010). Statistically significant negative correlations were found between high emotional eating behavior and: low social support (r = - .27, p < .0001), low emotional support (r = - .23, p < .0001), low fruit/vegetable consumption (r = - .13, p = .006), and decreased sleep (r = - .12, p = .01).

Intercorrelations amongst these coping behaviors were also examined. Social and emotional support were highly correlated with each other (r = .71, p < .0001) as noted previously; and these had low but significant correlations with sleep (social support/sleep [r = .18, p < .0001], emotional support/ sleep [r = .20, p < .0001]). Low fruit/vegetable consumption was not correlated with sleep or support.

When these variables were entered into step wise regression with emotional eating behavior as the dependent variable, social support entered the equation first, explaining 7% of variance in emotional eating behavior (p < .0001). Low fruit and vegetable consumption entered next, adding 1% of variance (p = .01); for a total of 8% of explained variance in emotional eating behavior. Emotional support and sleep became non-significant and were excluded in the final model. However, the finding of low social support as a predictor of emotional eating is not in the literature. The relations amongst social support, role stress, and emotional eating behavior in clergy are important findings.

Restrained eating behavior. Restrained eating is defined as "the degree to which an individual eats less than he or she would actually like to eat" (Van Strien, Frijters, van Staveren, et al., 1986, p. 747). However, BMI is often high in restrained eaters (Boon et al., 2002; Elfhag & Morey, 2008). The ability to restrain one's eating may be undermined by alcohol consumption, tasting highly palatable food, anxiety, or stress (Polivy & Herman, 1976a, 1976b; Polivy et al., 2005), as well as distractors (Elfhag &

Morey, 2008; Wong et al., 2009). Thus, if one is a restrained eater, it is likely that his efforts will be frequently undermined by these factors and he will be overweight. Also, because distractors, stress, and anxiety trigger emotional eating, one must consider the influence of emotional eating on restrained eating behavior. In fact, in this study, clergy who were high restrained eaters had almost the same overweight and obesity rates, whether they were high emotional or low emotional eaters (see Table 16). However, as noted earlier, when restrained eating behavior was low, there was greater variation in BMI depending on whether emotional eating behavior was low or high.

Table 16

Comparison of eating behaviors to obesity rates (N = 430).

Eating Behaviors	Number	% Overweight	% Obese
High emotional eating High restrained eating	113	49.6%	39.7%
High emotional eating Low restrained eating	82	37.8%	52.4%
Low emotional eating High restrained eating	108	46.3%	39.8%
Low emotional eating Low restrained eating	127	43.3%	21.3%

*Mean score used to create high/low dichotomy.

To explore the relations amongst factors that undermine restrained eaters ability to restrain eating (Elfhag & Morey, 2008; Polivy et al., 2005; Wong et al., 2009), Pearson correlations were examined between restrained eating behavior and these factors: alcohol consumption, frequency of dining out, and clergy distractors and stressors (i.e., congregation size, teaching at a college, job description, evenings worked). Surprisingly, none were significant.

As noted, restrained eaters attempt to control their weight, but are often unsuccessful in this endeavor, leading to obesity (Herman & Mack, 1975; Herman &

Polivy, 1975; Wardle, 1986). Behaviors that represent efforts to control health and obesity include increased fruit/vegetable consumption and increased physical activity. Consistent with this assumption, small but significant positive correlations were found between restrained eating behavior and physical activity ($r = .17$, $p < .0001$), and fruit/vegetable consumption ($r = .16$, $p = .001$), thus confirming restrained eaters efforts to control their obesity. In contrast however, fruit/vegetable consumption was significantly negatively correlated with emotional eating ($r = - .13$, $p = .006$), and physical activity was not significant ($r = - .09$, $p = .06$). These findings point to the complexity of emotional and restrained eating behaviors in clergy.

LCMS clergy and BMI at different life points. It was anticipated that BMI in LCMS clergy would be high, and comparisons were planned between three life points to determine when obesity in clergy developed. Comparisons were also planned between LCMS clergy and the US population of adult non-Hispanic White males. Participants were asked to record current height, weight at high school and seminary graduations, and current weight; and BMI's were calculated for each of these life points. It was expected that the high school BMI in this analysis would be inflated (due to increase in height after high school) and there would be predictable increases in BMI with age.

In order to more accurately compare BMI in clergy at high school graduation and seminary graduation, BMI was compared to data from the Youth Risk Behavior Surveillance (YRBS) (CDC, 1999), and NHANES 1999-2000 survey (Flegal et al., 2010). With alpha set at .05, one sample Chi Square analyses were done using GraphPad software (2012). As seen in Table 17, at high school graduation, this sample of clergy

had a higher overweight/obesity rate but a lower obesity rate compared to the US population of non-Hispanic White males age 18 years in YRBS 1999 data ($X^2 = 75.14$, $df = 2$, $p < .0001$). At seminary graduation (mean age 32), this sample had similar obesity rates to US non-Hispanic White males aged 20 – 39, in NHANES 1999-2000 data (Flegal et al., 2010) ($X^2 = 2.73$, $df = 2$, $p = 0.26$). At the present time, LCMS clergy ($n = 430$) had a higher overweight/obesity (81.4% vs. 72.6%) and obesity (36.7% vs. 31.9%) rate than non-Hispanic White males ≥ 20 years in the general US population in NHANES 2007 – 2008 data (Flegal et al., 2010) ($X^2 = 16.95$, $df = 2$, $p = .0002$).

Table 17

Clergy BMI and obesity rates at different life points.

	LCMS Clergy			US Population	
Life Points	Mean BMI	Overweight /Obese	Obese	Overweight /Obese	Obese (Males)
High School Grad ($n = 423$)	23.5	31.9%	4.2%	21%[a]	7.5%[a]
Seminary Grad ($n = 426$)	27.1	63.9%	21.9%	67.4%[b]	22%[b]
Present Day ($n = 430$)	29.43	81.4%	36.7%	72.6%[b]	31.9%[c]

[a] High school YRBS: http://www.cdc.gov/healthyyouth/yrbs/index.htm
[b] Prevalence and Trends in Obesity Among US Adults 1999 – 2008 (1999-2000)
[c] Prevalence and Trends in Obesity Among US Adults 1999 – 2008 (2007 – 2008)

Assessment of central obesity. Because abdominal adiposity is associated with increased morbidity and mortality (Kopp, et al., 2010; Schäffler et al., 2006) clergy were also asked their waist size (belt or pant size) and if the "belly extended beyond the belt." Despite high levels of obesity in this group (81.4% overweight/obese; 36.7% obese), the mean waist size was below the critical value of 40 inches for abdominal adiposity in males ($M = 37.8$, range = 29 – 54 inches). Approximately 72% reported that the "belly"

did extend beyond the belt (61.6% a little, 10.7% a lot), and therefore it is evident that using belt/pant size did not accurately represent abdominal circumference. The "belly extending beyond the belt" (abdominal adiposity) was highly correlated with BMI ($r = .55$, $p < .0001$), and was not more highly correlated with health indicators than was BMI. Thus BMI alone appeared to be the best indicator of adiposity without actually measuring waist circumference.

Assessment of LCMS clergy health. Pearson correlations (alpha set at .05) between BMI and BRFSS questions on general health, life satisfaction, diabetes, hypertension, and high cholesterol were examined. High BMI was associated with decreased general health ($r = -.42$, $p < .0001$), decreased life satisfaction ($r = -.18$, $p < .0001$) and higher rates of hypertension ($r = .27$, $p < .0001$), diabetes ($r = .21$, $p < .0001$), and high cholesterol ($r = .13$, $p < .0001$). Thus high BMI is clearly associated with a decrease in quality of life and increase in morbidity.

Lifestyle factors were also explored in relation to BMI group using BRFSS and demographic questions. Significant negative correlations were found between high BMI and several health/coping behaviors: low physical activity ($r = -.24$, $p < .0001$), decreased sleep ($r = -.15$, $p = .003$), low fruit/vegetable consumption ($r = -.13$, $p = .006$), low emotional support ($r = -.23$, $p < .0001$), and low social support ($r = -.19$, $p < .0001$). High BMI was positively correlated with smoking ($r = .12$, $p = .02$), increased frequency ($r = .14$, $p = .003$) and quantity ($r = .12$, $p = .003$) of alcohol consumption, and frequency of eating dinner outside the home ($r = .13$, $p = .008$).

Comparisons between the health and lifestyle of this sample's clergy and that of the US general population were then made, again using one sample Chi Square analysis

in GraphPad software (2012). LCMS clergy self-described their current general health status more positively (see Table 18), but interestingly had significantly lower life satisfaction than the US population. They had similar rates for diabetes, high cholesterol, and hours of sleep per night, higher rates for pre-diabetes and pre-hypertension, and slightly lower rates for hypertension. They had significantly lower rates for smoking cigarettes and binge drinking of alcohol.

A question on physical activity was modified from the BRFSS "During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?," and this was changed to: "During the past month, how often did you participate in any physical activities such as running, circuit training, exercise games, walking, golf, or gardening for exercise." The BRFSS 2010 Codebook (CDC, 2011) reports this as a dichotomy (no/yes), however, in this study six response categories were used: never (3.5%), once a month (2.3%), two to three times a month (11.9%), once a week (15.8%), two to four times a week (46.7%), and five or more times per week (19.8%).

In order to compare physical activity in clergy to the US general population, a dichotomy was created. Clergy who responded never or once per month were labeled "no" (9.3%) and those who reported two to three times per month and more were labeled "yes" (90.7%). Clergy had significantly higher rates for physical activity than the US general population (no 24.8%/yes 75.2%) (X^2 = 83.11, df = 1, p = .0001).

Table 18

Comparison of Clergy (N = 430) to General Population (BRFSS 2009 – 2010)

Variable	Chi Square	*Df*	Significance	Clergy Rate	US Population
General Health	57.51	4	.0001*		
Poor				0.5%	4.4%
Fair				5.8%	11.9%
Good				34.7%	30.2%
Very good				44.9%	33.1%
Excellent				14.2%	20.4%
Life Satisfaction	208.24	4	.0001*		
Very dissatisfied				1.2%	1.0%
Dissatisfied				5.8%	4.3%
Neither				11.9%	2.1%
Satisfied				46.7%	47.6%
Very satisfied				34.4%	45.0%
Diabetes	55.15	2	.0001*		
No				83.7%	88.5%
Pre-diabetes				7.5%	2.2%
Yes				8.9%	9.3%
Hypertension	78.41	1	.0001*		
No				64.9%	68.1
Pre-HTN				9.4%	2.6
Yes				25.6%	29.3%

Table 18 continued

Comparison of Clergy (N = 430) to General Population (BRFSS 2009 – 2010)

Variable	Chi Square	*Df*	Significance	Clergy Rate	US Population
High Cholesterol	(no X^2)				
No				44.3%	61.9%
Borderline				19.4%	(not reported)
Yes				36.3%	38.1%
Smoking	257.45	2	.0001*		
Not at all				97.4%	59.4%
Some days				1.2%	11.7%
Every day				1.4%	28.9%
Binge drinking	78.92	1	.0001*		
				5.2%	23.2%
Physical activity	83.11	1	.0001*		
No				9.3%	24.8%
Yes				90.7%	75.2%
Hours of sleep	94.42	3	.0001*		
3 – 5 hours				0.9%	7.6%
5 – 6 hours				34.2%	21.2%
9 or more hours				0%	8.1%
7 – 8 hours				64.9%	63.1%

* Statistically significant two-tailed p value

Summary of Results

In this study of LCMS clergy, three main variables were examined: role stress, eating behaviors, and obesity. Eating behaviors were emotional eating behavior and restrained eating behavior. Clergy were found to have high rates of role stress and obesity; and emotional eating behavior was found to be a significant mediator of the relations between these two variables. Restrained eating behavior was not found to mediate the relations between role stress and obesity. Important relations were noted in the ancillary analysis as well. Emotional eating in the presence of restrained eating explained BMI grouping. Low social support was found to be significantly correlated with role stress and emotional eating behavior, and emotional eating behavior was negatively correlated with fruit/vegetable consumption. Obesity was significantly correlated with decreased lower general health, hypertension, diabetes, high cholesterol, and decreased life satisfaction.

Chapter V

Discussion

The purpose of this study was to investigate the relations among role stress, eating behaviors, and obesity in LCMS congregational clergy. This cross-sectional study also sought to further develop certain concepts and conceptual relations of the Neuman Systems Model (NSM) (2011), which Gigliotti (in press) notes have been largely neglected. Specifically, the operationalization of the core response concept, and investigation of the lines of resistance as mediators of the relation between normal line of defense invasion and a core response.

These conceptual relations were further investigated at the theoretical level through incorporation of the concepts of role stress theory developed by Kahn and colleagues (1964). The literature suggested that congregational clergy have unique role stressors (Hoge & Wenger, 2005; Lee, 1994; Meek et al., 2003; Proeschold-Bell et al., 2009; Virginia, 1998), which can result in role stress and high levels of obesity (Carroll et al., 2001; Halaas, 2002; Proeschold-Bell & LeGrand, 2010). The present study proposed that relations between these variables might be mediated by emotional and restrained eating behavior (Van Strien, Frijters, Bergers et al., 1986).

These theoretical linkages were tested at the empirical level as follows. Self-report of height and weight allowed for calculation of BMI as a measure of obesity. Role stress was measured utilizing the Role Conflict and Ambiguity Scales (RCAS) (Rizzo, House, & Lirtzman, 1970) and eating behaviors were measured by the Emotional and Restrained Scales of the Dutch Eating Behavior Questionnaire (DEBQ) (Van Strien, Frijters, Bergers et al., 1986). Additionally, demographic questions and questions from the Behavioral

Risk Factor Surveillance System (BRFSS) national health survey (CDC, 2011) provided information that was utilized to further understand and describe this sample's clergy, and compare them both to the general population, as well as to other clergy populations.

Consistent with Gigliotti's (1997) proposed tests of the normal line of defense, lines of resistance and core response relations, analysis was conducted using ordinary least squares regression equations outlined in the causal steps of mediation as described by Kenny and colleagues (Baron & Kenny, 1986; Judd & Kenny, 1981), and Test of Joint Significance (Kenny, Kashy, & Bolger, 1998). Additionally, bootstrapping was utilized to enhance the power of the analysis as recommended by Kenny (2012), Krause et al. (2010), and Preacher and Hayes (2008a). Four research questions were posed and these corresponded with the aforementioned steps of mediation. Separate analyses were performed for emotional and restrained behaviors.

The complete linkages between conceptual, theoretical, and empirical (C-T-E) levels of the study variables are depicted in Appendix A. This C-T-E was used to organize discussion of these findings. Specifically, findings concerning NSM concepts (Neuman, 2011) and Kahn and colleagues (1964) role stress theory will be discussed first as conceptual elements. Discussion of the research questions' results follows in the theoretical elements section, and issues concerning the operationalization of the study variables are discussed in the empirical referents section. Ancillary analyses are integrated as appropriate. Finally, methodological concerns are discussed.

Conceptual Elements

Both the NSM (Neuman, 2011) and Kahn et al.'s (1964) role stress theory describe the negative effects of environmental stressors on the individual and related

systems. Neuman envisions the client as a system that is protected by a series of concentric circles called the flexible line of defense, normal line of defense, and lines of resistance. These function to protect the basic structure or central core of the individual from stressors that may overwhelm the client system and increase the risk for morbidity and mortality. Each circle, as well as the core, is a composite of five interacting variables: physiological, psychological, sociocultural, developmental, and spiritual. Similarly, Kahn and colleagues describe the ultimate effects of role stressors as role strain; an overwhelming response, affecting both the physical and mental health of the individual, if not mitigated by personal factors.

Neuman (2011) views the core response as occurring when the lines of defense and resistance do not offer adequate protection and this involves a serious consequence to any or all of the five person variables. Notably, Neuman's (1989, 1995, 2002) previous descriptions of the core response were largely physiologic in nature. Gigliotti (in press) notes that perhaps this was the reason for lack of operationalization of this concept.

The core response in this study was operationalized as obesity, a condition that increases risk for morbidity and mortality. Indeed, LCMS clergy had high rates of obesity (36.7%), and obesity was positively correlated with: central adiposity/abdominal girth ($r = .55$, $p < .0001$), hypertension ($r = .27$, $p < .0001$), diabetes ($r = .21$, $p < .0001$), and high cholesterol ($r = .13$, $p < .0001$); and negatively correlated with general health ($r = -.42$, $p < .0001$). These conditions are directly linked to many of the current leading causes of death in the US: heart disease, cancer, cerebrovascular disease, Alzheimer's disease, diabetes, and kidney disease (CDC, 2009). Kahn et al. (1964) proposed that chronic role stress is exhibited as the symptomatology of role strain, or evidence of a

stressful life environment. Indeed, obesity and the associated chronic diseases, disabilities, and shortened lifespan are evidence of role strain. This symptomatology of role strain is consistent with Neuman's (2011) view of a core response. Thus these findings expand our knowledge of the core response.

This is the first published study to test Gigliotti's (1997) proposed mediated relations between the normal line of defense, the lines of resistance, and the core. Only one other study investigated mediation using the NSM (Yarcheski, Mahon, Yarcheski, & Hanks, 2010). However, they do not relate any of the study variables to the NSM.

Gigliotti (1997) proposed empirically testing the relations between normal line of defense invasion, the lines of resistance, and damage to the core with the four causal steps of mediation (Baron & Kenny, 1986; Judd & Kenny, 1981). At the time that Gigliotti made this proposal, Baron and Kenny (1986) maintained that the first mediation step was critical. However, it is currently thought that this first relation (path *c*) does not have to be significant to examine variables for an indirect effect (Kenny, 2012; Kenny, Kashy, & Bolger, 1998; MacKinnon, Krull, & Lockwood, 2000; Preacher & Hayes, 2008a; Shrout & Bolger, 2002).

Kenny (2012) recently noted that the four causal steps of mediation are "at best a starting point in a mediation analysis" (p. 2), that the focus should be on analysis of the indirect effect. These are important revisions to Gigliotti's (1997) proposed empirical test of mediated relations between the normal line of defense, the lines of resistance, and the core response. Results of this study show that the lines of resistance act as mediators of the relation between the normal line of defense invasion and the core response without Gigliotti's proposed link between the normal line of defense invasion and core response.

That is, while path *c* was significant, it accounted for a very small amount of variance in the core response, and as discussed below, this is likely due to the large sample size.

Theoretical Linkages

Figure 3

Conceptual and Theoretical Elements

Neuman's Concepts	→	Environmental Stressors	Normal Line of Defense Invasion	Lines of Resistance	Core Response
		‖	‖	‖	‖
Kahn et al.'s Grand Theory	→	Objective Role Conditions	Experienced Role Stress	Personal Characteristics	Role Strain
		|	|	|	|
Theoretical Linkages	→	Being an LCMS clergyman	Role Stress	Eating Behaviors	Obesity

Being an LCMS clergyman. Figure 3 depicts the links between Neuman's (2011) and Kahn et al.'s (1964) concepts and the study variables, the theoretical linkages. Neuman's environmental stressors and Kahn et al.'s objective role conditions were linked to being an LCMS clergyman. The stress reaction begins with stressors, and clergy have unique role stressors (Hoge & Wenger, 2005; Lee, 1994; Meek et al., 2003; Proeschold-Bell et al., 2009; Virginia, 1998). The clergy role was described as highly complex, involving coordinating, training, supervising, or managing the activities of others (Bureau of Labor Statistics, 2009). There were numerous studies describing stressors and high role stress in clergy in the literature (Bleiberg, 1998; Gleason, 1977; Hoge & Wenger, 2005; Kay, 2000; Kemery, 2006; Lee, 1994; Meek et al., 2003; Monahan, 1999; Proeschold-Bell et al., 2009; Verdieck, et al., 1988; Virginia, 1998), and both Halaas (2002) and Proeschold-Bell and LeGrand (2010) described links between high role stress

and poor health. However, there were no studies connecting role stress, eating behaviors, and obesity in clergy.

In retrospect, it is clear that the literature pointed towards two distinct themes as key stressors in the clergy role. The first are directly related to role complexity, such as: workload (Gleason, 1977, Lee, 1994), boundary ambiguity (Meek et al., 2003; Proeschold-Bell et al., 2009), conflicts with congregations and denominational leaders (Hoge & Wenger, 2005), not having a job description (Monahan, 1999), younger age, and less seniority (Kay, 2000). The second was related to social issues, such as: level of satisfaction with appointment (Kemery, 2006), lack of social support, sense of isolation (Verdieck et al., 1988; Virginia, 1998), and not having a clergyperson to confide in (Bleiberg, 1998; Gleason, 1977).

Clergy who commented on their role stressors in the comments section of the survey epitomized some of these stressors:

> "It is stressful that there are so many opinions in the congregation about what a pastor should do, and who a pastor is. This would include managing time and what are the most important things the pastor should be doing."
>
> "Stress usually occurs because of a few constant antagonists who do not nor desire to know and follow the Biblical role of pastor. They want a 'cruise' director."
>
> "My main stressor is a congregational leader who actively works to remove me from leading this congregation."
>
> "Trying to know people's expectations and meeting them."
>
> "Financial issues are the biggest stress factor."

Though role stressors were not measured in this study, ancillary analysis revealed ten stressors that were significantly correlated with high role stress. These stressors reflect the two noted themes: those directly related to role complexity (stress/anxiety

about personal finances, lower income, not having a job description, working a greater number of evenings per week, younger age, and less seniority) and those related to social issues (low social support, low emotional support, low socializing with congregants, and lack of satisfaction with housing). These stressors are intercorrelated, and stepwise regression showed that when considered together, only four of these made unique contributions to role stress variance. Together social support, financial stress, job description, and low socializing with congregants explained 23% of variance in role stress. However, clearly, having low social support was the most significant accounting for 16% of the variance. One reason for this low social support is connected to required mobility. It is common for clergy to move around the country as a "Call" arises and is accepted. This is exemplified in the following clergy comment:

> "My first Call took me over 2000 miles from my extended family at a time when we were expecting our 4th child and could have benefited greatly from their support. I have not yet received any calls closer to the family. My youngest children barely know their grandparents."

Additionally, the role of leader sets the clergyman apart from others, further contributing to social isolation. However, some may not recognize the need for social or emotional support. Interestingly, one clergyman wrote in the comments section:

> "I ignored the 'need to share my inner feelings' question. That's not an issue for me or, I would think, most men."

Clergy are advised not to socialize with congregants as it is believed that this may increase role stress (personal communication, R. Hesse, February 1, 2011). Reverend Hartwell (personal conversation, March 3, 2012) states that it is difficult for a clergyman "to be himself when socializing with parishioners" as he must be careful regarding the interpretation of his conversation and comments. He also notes that clergy are

encouraged to attend monthly "Circuit" gatherings, which provide collegiality without being on display as "the pastor." However, this may not be adequate support as some clergy commented:

> "When asking about support in ministry I have seen the lack of clergy support either from fellow clergy and/or within the denominational system. If support does come, it is based more on a set model rather than the individual and the circumstances."

> "Help us find an avenue to share our problems because Circuit meetings don't cut it."

Remarkably, though clergy are cautioned that socializing with congregants will increase role stress, this study's findings show the opposite is true. Low socialization with congregants unrelated to church business was related to high role stress (r = - .09, p < .04). However, this may be a reflection of existing conflicts between congregation and clergy, that clergy may have less social interaction when conflict is high.

Financial worry contributed 4% to clergy role stress variance. A comment by one clergy exemplifies the precarious financial situation experienced by some clergy:

> "A new level of stress is that we have a self-employed 'Call' but many congregations are letting pastors go with a two week notice. This has caused great stress for many both with congregations and those without. Pastors do not get unemployment because Congregations do not have to pay for unemployment insurance."

Finally, not having a job description was identified as a clergy stressor in the literature. Monahan (1999) found that having a job description (r = - 0.59, p < .05) and years of seniority (r = - 0.13, p < .10) were negatively correlated with role ambiguity. Similarly, these were also negatively correlated with role ambiguity in LCMS clergy (having a job description, r = - .29, p < .0001; years of seniority, r = - .15, p = .002). Role

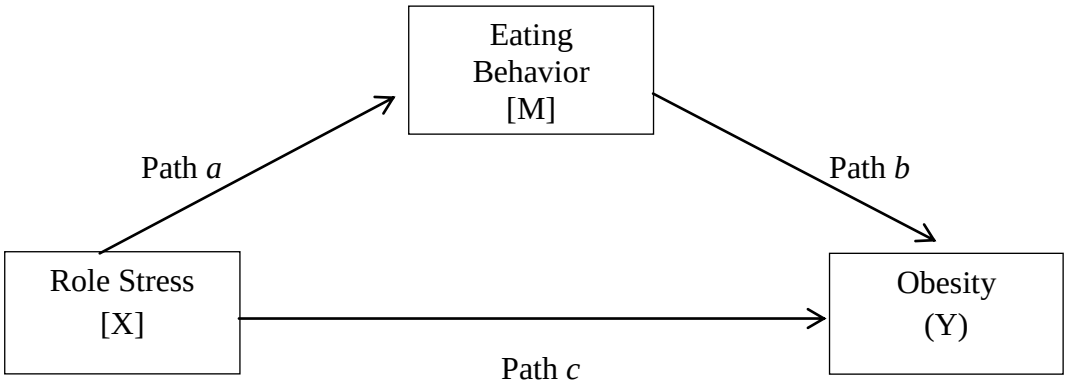
conflict, which was not measured by Monahan (1999), had a smaller negative correlation with having a job description (r = - .12, p = .02) than role ambiguity in LCMS clergy.

Clergy have been identified as having difficulty with boundary ambiguity, as well as role conflict and role ambiguity (Bleiberg, 1998; Hoge & Wenger, 2005; Kemery, 2006; Proeschold-Bell & LeGrand, 2010). Not having a job description contributes to these stressors. Having a job description helps clergy to define their role, and diminish conflict and ambiguity.

Role stress and obesity. Research question one asked: "Does role stress contribute to explained variance in obesity in congregational clergy?" This corresponds with path *c* in Figure 4. Neuman's (2011) normal line of defense invasion, which is Kahn and colleague's (1964) role stress, was linked to clergy role stress. Likewise, the core response/role strain was linked to obesity (see Figure 4).

Figure 4

Path diagram of proposed relations between study variables.



A weak but statistically significant relation was found between role stress and obesity (r = .11, p = .02), however this may be due to the large sample size (N = 430),

which increased the power of the test. In fact, role stress accounted for only 1% of variance in obesity. These relations represent path *c* of the mediated model, and as previously noted, Kenny (2012) and others (Kenny, Kashy, & Bolger, 1998; MacKinnon, et al., 2000; Preacher & Hayes, 2008a; Shrout & Bolger, 2002) currently maintain that this path need not be significant in order to demonstrate mediation. Thus, even if it had not been at all statistically significant, the test of the mediated model could continue.

One reason for this low correlation between role stress and obesity may be role stress levels. It was expected that role stress would be high (range 15.00 – 81.00) in this clergy group, and instead was moderate (M = 46.60, SD = 11.50). This may be due to increased age (M = 51 years, SD = 11), and years of clergy service (M = 19 years, SD = 11), as role stress was negatively correlated with both age (r = - .15, p = .001) and seniority (r = - .14, p = .004). Increased age and seniority were found to have a positive influence on role stress in other studies of clergy as well (Evers & Tomic, 2003; Francis et al., 2004; Kay, 2000; Monahan, 1999; Ok, 2009). Increased age and seniority brings wisdom, and thus, better coping with role stress.

It is also possible that the temporal order of events influenced the relations between role stress and obesity; that is the timing of when each variable occurs. For example, when role stress is chronically high, increased eating results in obesity. However, when role stress lessens, weight may not be lost. The temporal order of events is a negative aspect of cross sectional surveys, when data is collected at only one point in time (Gelfand et al., 2009). In fact, one clergyman commented:

> "If you had asked me these questions when I was at my last congregation my answers would have been very different as the stress level there was very high."

Thus, current role stress levels may not be highly correlated with obesity, but their lasting effects are notable.

Role stress and eating behavior. Research question two asked, "Does role stress contribute to explained variance in eating behavior (emotional and restrained) in congregational clergy? This question represents path *a* of the mediated model (see Figure 4), and must be significant in order for mediation to be considered. However, only emotional eating behavior was significantly correlated with role stress ($r = .31$, $p < .0001$). Therefore, only emotional eating behavior could be examined as a mediator, and role stress explained 9% of variance in emotional eating behavior. This finding is in keeping with O'Connor et al.'s (2008) conclusions that "emotional eating behavior is the pre-eminent individual differences variable in understanding the impact of stress on eating behavior" (p. 27).

Role stress and emotional eating behavior. O'Connor et al., (2008) describe stress as the most powerful factor affecting internal influences of eating behaviors. In this study emotional eating behavior was seen as a coping behavior. Eating high fat/high sugar foods, as well as eating too much food, increases blood sugar and provides an opioid release, diminishing the individual's sensation of stress, improving mood, and decreasing anxiety (Adam & Epel, 2007). One clergyman commented:

> "I eat too much and I'm overweight. But it keeps my energy level up so I can keep on keeping on. I wouldn't have it any other way."

On a short term basis, eating extra food or high fat/high sugar food is indeed protective (Adam & Epel, 2007). However, when stressors are of a chronic nature, and eating extra calories is utilized to cope on a regular basis, then weight is gained leading to obesity. Indeed, ancillary analysis revealed a significant relation between high emotional

eating and low fruit/vegetable consumption (r = - .12, p = .006), supporting Adam and Epel's work concerning a preference for high fat/high sugar foods.

Role stress and restrained eating behavior. The relation between role stress and restrained eating behavior was not statistically significant (r = .01, p = .81) and, in fact, was almost non-existent. This was surprising because restrained eating was described as a behavior that was affected by stressors and linked to obesity in non-clergy groups (Boon et al., 2002; Elfhag & Morey, 2008; Van Strien, Herman, & Verheijden, 2009; Wong et al., 2009). This is because stressors undermine one's efforts to restrain eating.

In light of the fact that no relation existed between role stress and restrained eating behavior, relations between clergy complexity factors and restrained eating behavior were investigated. However, no statistically significant relations, either negative or positive, were found between restrained eating and congregation size, attendance at services, frequency of evening meetings, teaching at a college in addition to being a congregational clergyman, having responsibility for a church based school, working with commissioned deacons or others, having a job description.

It was also considered that the restrained eating scale of the DEBQ (Van Strien, Frijters, Bergers, et al., 1986) measures an individual's intent to restrain food intake rather than their success at restraining food intake. The intent to restrain food intake would then precede role stress but once the individual experiences role stress this intent is thwarted by the stress and he is not successful at restraint. Therefore, as role stress is noted to decrease restraint in the restrained eater, what should have been measured is the ability to restrain intake when faced with increased role stress, rather than the intent to restrain. A few clergy illustrated these relations in their comments:

> "You asked if I am consciously trying to cut back on my eating, which I am. However, you did not ask if I succeed, which I do not."
>
> "Meal planning is extremely difficult given the number of hospital and home visits I must do each month. The majority of my congregation is 75+ and many are unable to leave their homes or are in the hospital or nursing home."

In this last example, it is not role complexity that triggers unrestrained eating, but that role complexity results in little time to plan one's meals, and thereby control intake.

Therefore, it appears that the theoretical rationale for examining restrained eating behavior as a mediator between role stress and obesity was not well grounded. Restrained eating behavior was significantly related to obesity ($r = .15$, $p < .0001$), but there was a paucity of evidence linking it to role stress. Although this too may be related to the temporal order of events, this is doubtful. It appears that what should have been measured was role stress and intake in restrained eaters, not intent. However, it is also possible that the purported relations between stress and restrained eating may in reality be related to the individual's degree of emotional eating behavior.

Eating behavior and obesity. Research question three asked, "Does eating behavior (emotional and restrained) affect the relationship between role stress and obesity in congregational clergy?" This represents path *b* of the mediated model, and must be significant in order for mediation to be possible. There is a statistically significant relation between emotional eating behavior and obesity ($r = .30$, $p < .0001$). Therefore emotional eating behavior does affect the relations between role stress and obesity in congregational clergy, contributing 9% to explained variance in obesity.

Because there is no statistically significant relation between role stress and restrained eating behavior ($r = .01$, $p = .81$), it is not possible for restrained eating behavior to mediate the relation between role stress and obesity. However, a small but

statistically significant relation was found between restrained eating and obesity ($r = .15$, $p < .0001$). Restrained eating contributes 2% to the explained variance in obesity.

In light of the finding that emotional eating was more strongly correlated with obesity than restrained eating ($r = .31$, $p < .0001$ versus $r = .15$, $p < .0001$) and because an individual can be both an emotional and a restrained eater (Macht, 2008, Wong et al., 2009), it was considered that there might be an interaction present. That is, emotional and restrained eating behaviors may moderate each other such that restrained eating may affect obesity only in the presence of emotional eating. In fact, when emotional and restrained eating behaviors were dichotomized at their means, emotional eating behavior made a statistically significant contribution to obesity ($F = 25.36$, $p < .0001$), but restrained eating behavior did not ($F = 2.21$, $p < .14$). However, there was a statistically significant interaction ($F = 12.32$, $p < .0001$) between emotional eating and restrained eating, and together with emotional eating behavior, contributed 9% to the explained variance in obesity.

Figure 5

Prediction of interaction between emotional and restrained eating behavior.

	- Low restrained eating	**+ High restrained eating**
- Low emotional eating	**- -**	**- +**
+ High emotional eating	**+ - ***	+ +

* Highest

When restrained eating behavior was high, BMI varied slightly but remained high, regardless of whether emotional eating behavior was high or low. However, when restrained eating behavior was low, there was great variation in BMI, based on emotional eating behavior (see Figure 5). A review of the literature revealed only one other study

(Macht & Mueller, 2007) that demonstrated an interaction between emotional and restrained eating behavior, however that study looked at the effects of emotional and restrained eating responses to chocolate and affect. It must be noted however, that research utilizing the DEBQ (Van Strien, Frijters, Bergers, et al., 1986) is published in several other languages, and only English language articles were reviewed.

In the a priori review of the literature, emotional eating behavior was identified as "the pre-eminent individual differences variable in understanding the impact of stress on eating behavior" (O'Connor et al., 2008, p. 27). In contrast, strong relations between restrained eating and role stress were not identified. Additionally, emotional eating behavior was studied alone in a number of studies (Konttinen et al., 2010; Larsen, Van Strien, Eisinga, & Engels, 2006; Schneider et al., 2012; Van Strien, Herman, Anschutz, Engels, de Weerth, 2012), but not restrained eating behavior, leading to the suspicion that the influence of restrained eating behavior has been neglected.

Although Polivy et al., (1978) viewed "emotionality" as an aberration of restrained eating behavior it is possible that the reverse is true. The logic that is applied here is that the ability to restrain is believed to be counter-regulated by stress, and stress is directly related to emotions. Therefore, if there was no stress, restraint would be successful. However, as restraint may vary hour by hour in a given day, this variable is difficult to measure, especially in a cross-sectional study.

Role stress, eating behavior, and obesity. Research question four asked: "Does eating behavior (emotional and restrained) completely mediate the relations between role stress and obesity in congregational clergy?" Because there is no relation between role stress and restrained eating behavior, it is not possible for mediation to occur. However,

emotional eating behavior does mediate the relations between role stress and obesity but it is not possible to claim complete mediation, although the relations between role stress and obesity diminish from β = .010, *p* = .018 to β = .002, *p* = .597.

The relations between role stress, emotional eating behavior, and obesity were tested for mediation with the causal steps of mediation (Baron & Kenny, 1986; Judd & Kenny, 1981), the Test of Joint Significance (Kenny, Kashy, & Bolger, 1998), and bootstrapping (Efron & Tibshirani, 1993; Preacher & Hayes, 2008a; Shrout & Bolger, 2002), and all demonstrated a significant indirect effect. Of these, bootstrapping was the most powerful, and this test demonstrated: confidence intervals (bias and corrected) did not cross over zero (95% *CI*, .0049, .0122), a significant indirect effect (*r* = .0081, *p* < .0001, *SE* = .0018) a Z score > 1.96 (*Z* = 4.45), and the equation *ab*/ [*c´* + *a*b*] (Alwin & Hauser, 1975; Sobel, 1982) resulted in a proportion mediated of 78%. Additionally, the reliability of the mediator (emotional eating scale) was > .90 (.96), provides reassurance that Paths *a* and *b* were properly estimated (Frazier et al., 2004).

However, Kenny (2012) notes that when the standardized value of path *c* is < ± .2 (path *c*, *r* = .11), the calculations for proportion mediated may be unstable. Additionally, the proportion mediated must be > 80% to claim complete mediation (Kenny, 2012). Therefore, emotional eating behavior partially mediates the relations between role stress and obesity. This was discussed further in the Methodology section.

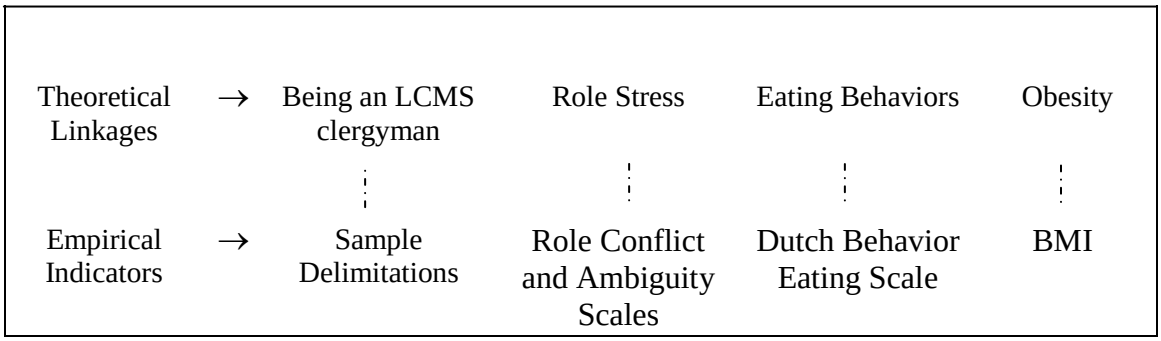
Empirical Indicators.

This cross-sectional, correlational study utilized several empirical indicators (RCAS, DEBQ, select BRFSS questions, and demographic questions) to test specified relations of the NSM (Neuman, 2011) and Kahn and colleague's (1964) role stress

theory, and to describe LCMS clergy (see Figure 6). A randomized sample of 1,272 LCMS clergy received a request to participate in this study via email, and the survey was completed via a link to an internet data collector, SurveyMonkey. Data collection will be discussed in greater detail in the Methodological Concerns section.

Figure 6

Linkages between Theoretical Elements and Empirical Indicators



Sample delimitations. Being an LCMS clergyman was operationalized by controlling for stressors in the sample. Specifically, this sample was delimited by gender, marital status, education, history of anorexia, bulimia, or weight loss surgery, and living in the US. This was because obesity is higher in married (28.7%) versus widowed (19.2%) or never married (19.4%) men, decreases proportionally as education level increases (Schoenborn & Adams, 2010), and is higher in women (CDC, 2010a). It is known that BMI can be different in those with a history of weight loss surgery and eating disorders, and the influence of living in a different country was unknown, therefore these were delimitations as well. Only 44 clergy did not meet the study delimitations.

However, because there is a higher rate of obesity amongst non-White men (Flegal et al., 2010), questions on race and ethnicity were included in order to perform between group differences based on these factors. Race/ethnicity information was not

available when obtaining contact information for this clergy group making it impossible to oversample this group and, unfortunately, the number of non-White clergy who responded (1.2%) was not enough to perform any statistical comparisons. Scores on role stress, eating behaviors, and BMI for non-White and mixed race participants were examined and appeared to be in the range of scores of White participants. Therefore, these participants were included in all analyses.

Role Conflict and Ambiguity Scales. The RCAS (Rizzo, House, & Lirtzman, 1970) was utilized to measure role stress in clergy (see Figure 6). The RCAS is a 14-item, seven point (Definitely not true/Extremely true) tool comprised of two scales: eight role conflict and six role ambiguity questions. Scores may range from 14 to 98, and high scores indicate high levels of role stress. In this study, scores ranged from 15 to 81 (M = 46.6, SD = 11.5). Cronbach's alpha (Nunnally & Bernstein, 1994) was .85 for this study, and this was comparable to reliability estimates reported in other studies (at or above .71) (Rizzo et al., 1970; Smith et al., 1993; Tunc & Kutanis, 2009).

It was hypothesized that role stress would be high in clergy, however it was moderate. Additionally, the size of the relation between role stress and obesity (r = .11) was small. This may be due to the temporal order of events; that each variable may occur at a different point in time and therefore not appear related in a cross-sectional study, or a misfit between the RCAS and the study population. Also, stress from other roles, such as family stressors was not measured. Several clergy did comment on the stress of caring for disabled parents and partners. Therefore, it is possible that either an additional tool or a different tool might capture role stress experienced by clergy more completely.

It is most likely that the significance of the relations between role stress and obesity is due to the large sample size ($r = .11$, $p < .02$). However, the relation between the predictor and outcome variables need not be significant to demonstrate mediation (Kenny, 2012). The predictor – outcome relation is implied when significant relations are demonstrated between the predictor and the mediator, and the mediator and the outcome (Frazier et al., 2004). When the relation between the predictor and outcome variables is non-significant, and mediation is demonstrated, it is most likely a partially mediated relation. This finding is consistent with emotional eating behavior acting as a partial mediator between role stress and obesity (77 - 78%). Additionally, as significant medium effects were demonstrated for paths *a* and *b*, and the indirect effect is significant; these are the critical elements to demonstrate mediation (Kenny, 2012).

Dutch Eating Behavior Questionnaire, Emotional and Restrained Scales. The DEBQ (33 items) was developed to measure eating behaviors with three individual scales (five point, Never/Very often): emotional (13 items), restrained (10 items), and external (10 items) (Van Strien, Frijters, Bergers et al., 1986) (see Figure 6). The external scale was not used in this study.

Emotional eating behavior is defined as eating in response to both diffuse and clearly labeled emotions (Van Strien, Frijters, Bergers et al., 1986), and restrained eating behavior is defined as the degree that an individual eats less than he or she would actually like to eat (Van Strien, Frijters, van Staveren et al., 1986). The reliability estimates for the emotional eating behavior scale (.96) and restrained eating behavior scale (.87), were comparable to those in other studies (at or above .82) (Elfhag & Morey, 2008; Koenders & Van Strien, 2011; Van Strien, Frijters, Bergers et al., 1986). Scores on emotional and

restrained scales were compared to several studies that included adult males (non-college students). This tool has never been used to study clergy, and also has not been used in such a delimited group. As noted earlier, mean BMI in this clergy group was 29.43, mean age was 51 years (range 26 – 79), mean score on the emotional eating scale was 2.28 (*SD* = 0.8), and mean score on the restrained scale was 2.83 (*SD* = 0.66).

Comparison of scores to other studies. Clergy scores on the eating behavior scales were compared to three recent studies of adults. These included a study of eating styles and lifestyle factors of banking employees (males, *n* = 963) (Koenders & Van Strien, 2011), a study comparing gender differences in the association between alexithymia and emotional eating in obese individuals, (males, *n* = 70) (Larsen et al., 2006), and a convenience sample of patients referred to Karolinska University Hospital (Sweden) for obesity treatment (males, *n* = 160) (Elfhag & Morey, 2008); mean age ranged from 43.6 to 44 years. Greater variation was noted in emotional eating behavior scores than restrained eating scores in these studies.

Only two measured restrained eating behavior (Elfhag & Morey, 2008; Koenders & Van Strien, 2011) and although mean BMI varied across these two studies (25 to 40), scores for restrained eating behavior were the same, 2.8 (*SD* = 0.6) and 2.8 (*SD* = 0.75). The restrained eating behavior score for clergy was similar (2.83, *SD* = 0.66). However, it appears that emotional eating behavior scores are higher in males with higher BMI.

Mean BMI (25, *SD* = 3.5) and mean emotional eating behavior score (1.94, *SD* = 0.7) were lowest among banking employees (Koenders & Van Strien, 2011). BMI in the study comparing alexithymia and emotional eating varied depending on recruitment source: newspaper (*M* = 33.9), obesity journal (*M* = 46.3), and obesity clinic

(*M* = 39.4), and the mean score for emotional eating behavior was higher (*M* = 2.7, *SD* = 0.9) (Larsen et al., 2006). In the last study, which examined eating behaviors in clients presenting for obesity treatment at Karolinska Hospital, mean BMI was 40.5 (range 30 – 60), and mean score for emotional eating behavior was also higher (*M* = 2.2, *SD* = 0.8) (Elfhag & Morey, 2008). Scores for emotional eating behavior in clergy (*M* = 2.28) were most similar to studies of obese males (BMI ≥ 30) (clergy BMI, *M* = 29.43, *SD* = 5.46).

BMI. Obesity was measured by self-report of height and weight, as self-report of BMI in males was found to be an accurate assessment (Dhaliwal et al., 2010; Stommel & Schoenborn, 2009). The BMI was derived by multiplying weight in kilograms divided by height in meters squared (Morrow et al., 2011, pp. 17 - 34). Only three clergy studies have measured BMI (Carroll et al., 2001; Halaas, 2002; Proeschold-Bell & LeGrand, 2010) and, based on these studies, it was expected that LCMS clergy would have elevated BMI's. Indeed, the obesity rate was 36.7% (BMI ≥ 30), with an additional 44.7% overweight (BMI 25 – 29.99), and only 18.6% of clergy had a normal BMI (18.6 – 24.99). None were underweight. The combined overweight/obesity rate was 81.4%.

An elevated BMI is further defined by grade of obesity. Among clergy with BMI ≥ 30, most (61.4%) had Grade I obesity (BMI 30.00 – 34.99), 21.1% had Grade II obesity (BMI 35.00 – 39.99), and 14.6% had Grade III obesity (≥ 40). Grades II and III infer an increased risk for morbidity/mortality. For those who are overweight or have Grade I obesity, assessment of abdominal adiposity provides further assessment of risk.

To assess abdominal adiposity, clergy were asked their waist size (belt or pants size) and whether the "belly extended beyond the belt." The literature on abdominal adiposity is typically collected via measurement by an examiner, such as in the NHANES

surveys. As the mean waist size in this sample (M = 37.8 inches, range = 29 – 54 inches), was below the critical value of 40 inches that defines abdominal adiposity in men, and given the high rates of overweight and obesity in this sample, self-report of waist size appears to be an unreliable assessment. Additionally, as the "belly extending beyond the belt" was significantly correlated with BMI (r = .55, p < .0001), and 72% of the sample reported that the "belly extended beyond the belt" either a little (61.6%) or a lot (10.7%), this also confirms that pants or belt size is unreliable when used alone as a self-report measure of abdominal adiposity. Therefore, in a self-report survey, as self-report of pant/belt size are not reliable indicators of adiposity, BMI alone appears to be the best tool for assessment of obesity.

Ancillary analysis. The Neuman Systems Model (Neuman 2011) environmental stressors, and Kahn and colleagues (1964) objective role conditions were linked theoretically to being an LCMS clergyman. The ancillary analysis was used to further examine and describe being an LCMS clergyman. Demographic questions and questions taken from the BRFSS were used to compare clergy to the US general population, and important comparisons are discussed regarding health, life satisfaction, physical activity, fruit and vegetable consumption, and sleep. Comparisons were also made between LCMS clergy and other clergy groups. In addition to the examination of moderating or interaction effects, additional analyses regarding demographic factors were conducted. These data provided valuable information and comparisons of clergy, and many of these have already been discussed.

Obesity comparisons. In this sample of LCMS clergy, obesity was statistically significantly higher than the US general population of non-Hispanic White males' ≥ 20

years (36.7% versus 31.9%). Obesity in LCMS clergy was also higher than that in other clergy studies (Carroll et al., 2001; Halaas, 2002) and very similar to the most recent study of UMC clergy in North Carolina (Proeschold-Bell & LeGrand, 2010). The finding of higher rates of overweight and obesity in LCMS clergy than in the general non-Hispanic White adult male population, as well as other clergy populations, confirms the need to address the problem of obesity within this group.

Interestingly, in this sample, obesity was highest in the Midwest region (39.8%) and the Western region (34.7%), then the Southern region (32.9%), and the Northeastern region (29.7%). Although, across the US, obesity is highest in twelve mostly Southern states (≥ 30%); and of these, is highest in Mississippi (≥ 34%) (CDC, 2012). Occurrence of overweight was highest in the Northeast (56.8%), followed by the South (47.6%).

Data on the study variables and clergy stressors were compared across these four groups, although some findings may be related to inequality in sub-group size (Midwest, n = 236; South, n = 82; West, n = 75; Northeast, n = 37). The Southern group had the highest rate of doctoral preparation (14.6% in progress, 8.5% completed), and literature has demonstrated that higher education is inversely proportional to obesity (Shoenborn & Adams, 2010). As obesity is highest in the South in the US population, but was lowest among clergy, education may indeed be protective.

Clergy in the Midwest had the highest rate of obesity, and although this may be related to having the largest sub-group, Midwest clergy had the highest rates for numerous stressors that were significantly correlated with role stress: worry about personal finances, lower incomes, larger congregations/attendance, more evenings per week having church responsibilities, low emotional support, low social support, low

socialization with congregants, and housing dissatisfaction. Additionally, this sub-group had the youngest mean age (M = 50), second highest group without a job description, the second lowest rate of doctoral preparation, and not surprisingly the highest life dissatisfaction. For all groups, scores on role stress (range 46.36 – 47.36), emotional eating (range 2.20 – 2.33), and restrained eating (range 2.65 – 2.89) did not vary greatly. It is notable that Midwest clergy appeared to have the highest stressors related to role stress, but did not score differently on the RCAS. As discussed previously, this may be due to the temporal order of events, or a mismatch between clergy stressors and measurement of role stress.

Given the high incidence of overweight/obesity amongst LCMS clergy in this study, their BMI trajectory was compared with that of the US population of adult non-Hispanic White males. It was expected that the high school BMI would be inflated, due to increase in height after high school, and there would be predictable increases in BMI with age. Clergy were asked their weight at three different life points and current height, and BMIs were calculated for: high school graduation, seminary graduation, and current.

At high school graduation, clergy had an obesity rate of 4.2%, and this was lower than US population of non-Hispanic White adult males (7.5%) (Flegal et al., 2010). Obesity increased by 17.7% from high school (4.2%) to seminary graduation (21.9%), which is almost double the increase expected in young men (9.3%) from age 18 to age 29 (Burke et al., 1996; CDC, 2010a). When obesity at seminary graduation (21.9%) was compared to current obesity (36.7%), the rate increased by 14.8%, however the expected increase across age groups 30 – 39 to 50 – 59 years is only 2.5% (CDC, 2010a).

Clergy had higher rates for both overweight (44.7% versus 40.7%) and obesity (36.7% versus 31.9%) than the US population of non-Hispanic White males (Flegal et al., 2010), and the mean BMI for clergy was 29.43, which is at the upper limits of the overweight range (25.00 – 29.99). However, given their education level of Master's (81.6%) and doctoral degrees (12.3% in progress, 6% completed degree); the expected obesity rate for this group of males is 18% (Shoenborn & Adams, 2010).

The obesity rate in clergy is significant as it is double what is expected, higher than the general population, and only 18.6% of clergy had a normal BMI. As clergy BMI increased from mid-normal (≤ 23.5 [inflated value]) at high school graduation to mid-overweight (27.1) at seminary graduation to borderline obese (29.43) at the time of the study, it is clear that overweight and obesity developed for most clergy in adulthood; most likely beginning in seminary, and continuing to the time of this study.

Obesity and risk for chronic disease. The literature on obesity describes an increased risk for morbidity and mortality due to increased risk of chronic diseases, and these relations were investigated in LCMS clergy. Although obesity is linked to risk for: heart disease, high cholesterol and stroke (Lee et al., 2009); diabetes (Hussain et al., 2006); hypertension (Williams, 2008); osteoarthritis (Schäffler et al., 2003), asthma, rheumatoid arthritis, and hepatic diseases (Michelson et al., 2009; Sell et al., 2010), and several cancers (Dixon, 2010; Le Marchand et al., 1992; Moyad, 2001; Stoll, 2002; Wallström, et al., 2009; Xu et al., 2005), this survey asked only about general health, hypertension, diabetes, and cholesterol. Hypertension, diabetes, and high cholesterol are directly linked to five of the ten leading causes of death (heart disease, stroke, Alzheimer's disease, diabetes, and kidney disease; CDC, 2009), and are also components

of metabolic syndrome. As obesity in clergy was significantly correlated with hypertension ($r = .27$, $p < .0001$), diabetes ($r = .21$, $p < .0001$), high cholesterol ($r = .13$, $p < .0001$), and decreased general health ($r = -.42$, $p < .0001$), these findings demonstrate increased risk for disease related morbidity and mortality.

Decreased life satisfaction. This study asked one question on life satisfaction taken from the BRFSS: "In general, how satisfied are you with your life?" Clergy reported that they were mostly satisfied (34.4% very satisfied, 46.7% satisfied, 11.9% neither satisfied or dissatisfied, 5.8% dissatisfied, and 1.2% very dissatisfied). However, obesity was significantly correlated with decreased life satisfaction ($r = -.18$, $p < .0001$).

In this study, a total of 7% of clergy responded that they were dissatisfied or very dissatisfied with life, as compared to 5.3% of the US general population. Additionally, only 34% of clergy reported that they were very satisfied with life as compared to 45% of the US general population (CDC, 2011). These findings are important as decreased life satisfaction is often related to role strain, coping, and depression.

In a study of life satisfaction in adults, perceived stress was a predictor of decreased life satisfaction in adults under age 40 ($r = -.62$, $p < .05$), and coping resource effectiveness was a predictor of life satisfaction in adults over age 40 ($r = .36$, $p < .05$) (Hamarat et al., 2001). Similarly, role strain was found to have a negative moderate impact on life satisfaction ($r = -.37$, $p < .05$) in a study of US sales personnel (Engle & Prince, 2011). In LCMS clergy, life satisfaction was negatively correlated with role stress ($r = -.51$, $p < .0001$), and emotional eating ($r = -.33$, $p < .0001$) (coping).

Decreased life satisfaction is also related to depression in adults. This was a finding from a BRFSS 2006 data analysis (Strine, Kroenke et al., 2009). Approximately

8.7% of adults reported current depression, and of those who were dissatisfied or very dissatisfied with life, only 1.3% did not report any type of depression. Depression was also related to decreased social support. Of those who reported that they rarely or never received social or emotional support, only 5.8% reported not having depression.

In a second report on BRFSS 2006 data, chronic diseases, such as cardiovascular disease and diabetes, were found to be significantly correlated with current depressive symptoms, as well as with lifetime diagnoses of depression and anxiety ($p < .001$) (Strine, Mokdad et al., 2008). Depression is also significantly related to obesity and emotional eating behavior. In a study of obese adults, depression ($\beta = .32$, $p < .01$) was significantly correlated with emotional eating behavior, explaining 25% of variance in emotional eating (Larsen, et al., 2006).

Although great consideration was given to asking about depression, as this was an internet survey and completely anonymous, it was not possible to include this question without providing resources or intervention. However, it was suspected that depression was high in clergy as 16% of male ELCA clergy reported depression, and 10% reported taking antidepressant medication (Halaas, 2002). Therefore, decreased life satisfaction is a significant finding in LCMS clergy as this variable is related to depression, as well as having significant relations with role stress, emotional eating behavior, and obesity.

Physical activity. Experts advise 150 minutes of moderate-intensity aerobic activity a week, including activities such as brisk walking or general gardening, or 75 minutes per week of vigorous-intensity aerobic physical activity (CDC, 2011). Only one question was asked about physical activity, "During the past month, how often did you participate in any physical activities such as running, circuit training, exercise games,

walking, golf, or gardening for exercise." Although clergy were not asked about the number of minutes of activity, six response categories were provided in order to evaluate the physical activity of clergy, ranging from: never (3.5%), once a month (2.3%), two to three times a month (11.9%), once a week (15.8%), two to four times a week (46.7%), to five or more times per week (19.8%). It was expected that clergy would have low levels of physical activity however most (66.5%) met the current recommendations. Physical activity was negatively correlated with BMI (r = - .24, p < .0001).

Small but statistically significant relations were found between restrained eating behavior and physical activity (r = .17, p < .0001). This was seen as restrained eaters attempting to control obesity. In contrast, physical activity was negatively, but not significantly related to emotional eating (r = - .09, p = .06). Similarly, in a study of emotional eating and lifestyle behaviors in adults, emotional eating was negatively, but not significantly related to physical activity (r = - .07) (Koenders & Van Strien, 2011).

Fruit and vegetable consumption. Similarly, experts advise increased fruit and vegetable consumption. The current recommendation for daily fruit and vegetable consumption is a combination of ≥ 5 servings for an adult male (1 serving = 1 cup or ½ cup, depending on the type of fruit and vegetable) (USDA, 2012). Therefore, fruit and vegetable consumption may be used to evaluate healthy habits and food choices. Fruits and vegetables tend to be lower in calories and high in fiber, and are nutrient dense.

One question was asked about fruit/vegetable consumption, "Not counting potatoes or corn, how many total servings of fruit and vegetable did you eat yesterday? A serving would equal one medium apple, a handful of broccoli, or a cup of carrots." Clergy responses were: 0 servings (4.4%), 1 (16.4%), 2 (28.5%), 3 (22.9%), 4 (15.0%),

5 (10.0%), and 6 or more servings (2.8%). Therefore, only 12.8% of clergy met the recommended nutritional requirement. As BMI and physical activity are high, and fruit/vegetable consumption is low, it can be assumed that clergy are consuming larger quantities of energy dense foods (high fat/high sugar). Fruit/vegetable consumption was negatively correlated with emotional eating behavior (r = - .12, p = .006).

Similarly, emotional eating behavior was linked to high energy dense food intake in a Finnish national health study that included males aged 25 to 64 years (n = 1,679) (Konttinen et al., 2010). Emotional eating was significantly correlated with sweet foods (r = .15, p < .001), non-sweet foods (r = .11, p < .001), total energy intake (r = .11, p < .001), and fat intake *(*r = .09, p < .001) in males. Fruit and vegetable consumption was not significantly correlated with emotional eating (r = .04, NS). These authors described emotional eating behavior as the most influential eating behavior.

In contrast, restrained eating behavior in clergy was significantly positively associated with fruit/vegetable consumption (r = .16, p = .001). It is believed that this reflects restrained eaters attempts to control obesity. Fruit/vegetable consumption was also negatively correlated with BMI (r = - .13, p = .006).

Sleep. Adequate amounts of sleep are also advised by experts, as too little (≤ 6 hours) or too much sleep (≥ 9 hours) are associated with increased morbidity and obesity (Patel et al., 2006; Watanabe et al., 2010). Sleep was viewed as a coping behavior, one that can help the individual to cope with stressors. Only one question was asked concerning sleep habits, "On average, how many hours do you sleep per night?" and responses included: 7 – 9 hours (64.9%), 5 – 6 hours (34.2%), 3 – 4 hours (.9%), and ≥ 9 hours (0%). Approximately one third did not get the recommended amount of sleep per

night, and reduced sleep was significantly correlated with high BMI (r = - .15, p = .003) and emotional eating behavior (r = - 12, p = .01). Significant relations were found between sleep and other coping behaviors; emotional (r = .20, p < .0001) and social support (r = .18, p < .0001). A question on napping, "Do you take naps?" was not significantly correlated with any of the study variables, and not related to sleep.

Clergy sleep patterns were compared to the general population as well. Although percentages for 7 – 9 hours of sleep were essentially the same (64.9% versus 63.1%), clergy differed from the general population in the other three categories: 5 – 6 hours (34.2% versus 21.2%), 3 – 4 hours (.9% versus 7.6%), and ≥ 9 hours (0% versus 8.1%). Chi-square analysis reflected these differences (X^2 = 94.42, df = 3, p < .0001), and it appears that clergy utilize better sleep habits.

In addition to comparisons already discussed, clergy reported more positive self-assessments of general health than the US population (lower for "excellent", but higher for "very good" and "good"). This was surprising given their higher rates of obesity, lower life satisfaction, and similar rates for diabetes and high cholesterol than the US population. Clergy also had higher rates for pre-diabetes and pre-hypertension, which are most likely related to high levels of obesity. Clergy had lower rates for hypertension, and this is most likely related to lower rates for smoking cigarettes and binge drinking (Banda et al., 2010; Fuchs, Chambless, Whelton, Nieto, & Heiss, 2001) found in clergy.

Methodological Concerns

Several methodological concerns were identified during the course of this study. These included use of a mediated model with a cross-sectional study, and problems related to the internet delivery of the study.

Study design. All data on obesity in clergy has been from cross-sectional studies (Carroll et al., 2001; Halaas, 2002; Proeschold-Bell & LeGrand, 2010). Cross-sectional studies are appropriate when little is known about a problem or population. This type of study provides a snapshot of a population and variables, but provides no insight into the temporal order of events (Gelfand et al., 2009). In this case, role stress and stressors may be chronic or intermittent, and diminish somewhat with age (Hoge & Wenger, 2005; Lee, 1994; Meek et al., 2003; Proeschold-Bell et al., 2009; Virginia, 1998). Emotional and restrained eating behaviors are lifelong patterns (coping behaviors) that are activated by internal and external variables. Overweight and obesity may be lifelong patterns or not, but they may also increase and decrease in relation to internal and external variables. Therefore, stressors and role stress may lead to weight gain, and then role stress decrease but weight gain may not be reversed. So depending on when stressors and role stress are measured, they may or may not be linked to weight gain or obesity.

Certainly the significant relations between role stress and emotional eating behavior, and emotional eating behavior and obesity in this study provide insight into these relations. This study may be considered exploratory in nature, and a longitudinal study on the relations between role stress, emotional eating behavior, and obesity in clergy is recommended. Gelfand and colleagues (2009) describe that it is difficult to demonstrate mediation with cross-sectional data, especially when the variables to be studied do not occur within a short time of each other. It appears that obesity in clergy developed over an extended period of time.

Self-report of height and weight. Comparisons were planned utilizing current BMI, and BMI's at high school and seminary graduations. However, in retrospect,

consideration was not given to the potential for change in height after high school graduation. One clergyman wrote that he had grown four inches after high school graduation, and so this BMI value is most likely inflated.

Difficulty arose in finding statistics for BMI in 18 year olds from circa 1980, as 18 year olds were typically compared to pediatric growth charts using percentiles for comparisons. Data from the Youth Risk Behavior Surveillance from 1999 was utilized, though not ideal, clergy at high school graduation appeared to be more overweight (27.7% versus 13.5%) than the general population of 18 year old White males, and less obese (4.2% versus 7.5%) (CDC, 1999). The mean BMI for high school graduation (23.5) was in the normal range (18.6 – 24.9). Considering that these results are most likely inflated, overweight/obesity rates at end of high school are most likely lower.

Emotional eating awareness. In the DEBQ Emotional Eating Scale (Van Strien, Frijters, Bergers et al., 1986), questions are asked about whether the participant eats more when faced with certain feelings or emotions. In retrospect, it was considered that some emotional eaters may not be aware of the connection between feelings and food. This was exemplified in a clergy comment:

> "Some of the questions regarding eating habits might need clarification...my inclination is to eat when I am hungry, occasionally that occurs within the described condition, but I am not sure that the condition is the cause of my hunger."

Nationality. Although questions were included on race and ethnicity, consideration was not given to the influence of nationality when this study was designed. The social and cultural values of a region or nation, as well as common practices impact food choices. These may also be impacted by food availability. Culture specific ideal standards vary greatly, and this factor also affects body image and desired BMI. One

clergyman did write to express his thanks, and noted that he was born in a different country. In retrospect, questions on place of birth, length of time living in the US, and missionary work should have been included to control for these influences.

Internet design issues. Use of internet designed studies is relatively new, and Dillman and colleagues (2009) *Total Design Method* provided guidance. Additionally, tutorials provided through the SurveyMonkey website provided valuable help with survey layout and design. SurveyMonkey was easy to use, and survey settings were intuitive in nature. It was possible to access the survey for testing, and then clear the test answers before data collection began. This testing provided valuable feedback as to the ease of use, and appropriate grouping of questions per page. The fact that very little data was missing (0.4% of total data) may be a testament to ease of use of this survey design.

Response rate. A conservative response rate of 12.5% was calculated to allow for problems with hard bounce (invalid email address) and soft bounce (full mailbox and spam filtered email), and exclusion of clergy who did not meet the study's criteria. The overall response rate was 39.9%, which was the same as a web delivered survey of clergy by Hook and Worthington (2009) (response rate 39%). It is believed that the letter of introduction sent before the survey, the nature of the study (intended to help clergy), and having a dedicated email account "LCMSCongregationalClergyStudy@gmail.com," all contributed to the positive response rate. It appears that distribution of the survey during a prime vacation period (June 27 to July 17) did not negatively affect the response rate, and that three weeks was an adequate amount of time to complete the survey.

Limit to daily outgoing email. The researcher was surprised to discover that there was a limit to outgoing daily gmail of 900. This was discovered when the letter of

introduction was sent prior to the survey, and so all emails were grouped as 900 one day, and 372 the next day. Two reminders were sent; one a week after the initial survey was sent, and another a week later. After the initial survey was sent, 43% of responses were received, and after each reminder, a surge of responses was received. It was possible to log in to SurveyMonkey and observe the increasing number of total responses.

General email problems. After each group of emails was sent, messages were returned to the gmail box regarding difficulties with delivery. A total of 87 notices of delayed or failed delivery were noted after the first emailed notice, and this number varied slightly with each email sent. Some noted an email was not deliverable or was rejected, and others noted a delay would occur in receipt. It was not possible to accurately record how many of the delayed emails were actually delivered. Numerous messages were also received asking for verification of the sender before delivery would be allowed (to control spam mail), and verification was forwarded. A total of four emails were sent to each participant. Only five clergy asked to "unsubscribe," however one of these clergy noted that he had recently retired.

Although the SurveyMonkey data collector was set to not record IP addresses, it was set to allow only one submission. Three clergy emailed to report difficulty in accessing the survey, and these clergy were instructed to clear their browsers and re-try. It is not known whether this worked. It was noted that there were 20 completely blank surveys, and so it appears that some clergy looked at the survey but did not answer. It is not known if they returned to answer the survey on a different day, but were unable to. To remedy this problem in future surveys, participants should be informed that they might only access the survey once.

Consent. Surprisingly, although there was only 0.4% missing data in this study, almost one third (n = 120) of the delimited respondents did not click on the radio button for consent. The consent was sent as an email attachment so that respondents would be able to print and keep a copy if they desired, and the consent was also positioned at the start of the survey. The last sentence of the consent was, "If you have read and understand this statement regarding your participation in this survey, please click on the "Continue" button to indicate your consent to participate in this anonymous research study." The radio button was positioned on the bottom left of the consent, and in retrospect, the font was smaller than the font of the consent itself. The fact that the number of clergy who did not click on this, but did complete the survey, was so very large (28%) and the amount of missing data in comparison was so small (0.4%), led the researcher to believe that this was indeed an unintentional oversight. Consideration was given to discarding this data however this study had received approval as EXEMPT and discarding the data would not have been fair to those who took the time to complete the survey. Therefore, these participants were included in the analysis and their participation was considered tacit consent.

Mediation. Although the causal steps of mediation (Baron & Kenny, 1986; Judd & Kenny, 1981;) were once highly regarded as the standard test of mediation, Kenny (2012) now notes that this is "at best a starting point in a mediational analysis," and that contemporary analyses focus on the indirect effect (p. 2). Hayes (2009) and others note that bootstrapping should be the method of choice for testing mediation, as evidenced by comparative simulation research on mediated methods (MacKinnon, Lockwood, & Williams, 2004; Williams & MacKinnon, 2008). Of all the tests of the indirect effect

bootstrapping is considered the most powerful (Kenny, 2012; Krause et al., 2010; Preacher & Hayes, 2008a; Shrout & Bolger, 2002).

Mediation is demonstrated when bias corrected and accelerated confidence intervals do not include zero, the indirect effect is significant, the Z score is > 1.96 (Preacher & Hayes, 2008a), and the equation "total effect = direct effect + indirect effect" results in a balanced equation (Kenny, 2012). A benefit of bootstrapping is that it "does not impose the assumption of normality of the sampling distribution" (Preacher & Hayes, 2008a, p.880). As there was a positive skew in the BMI variable, this provided reassurance that the results were not a result of error.

A pre-requisite to mediation analysis is the verification that the mediator does not precede the predictor, and that the outcome does not precede the mediator. For example, that eating precedes obesity and not vice versa. These relations were based on theoretical rationale, as discussed in Chapter II, and were examined in multiple regression equations. Therefore, the researcher is confident that the path directions are correct.

Experts agree that complete mediation is demonstrated when the mediator and the predictor variable are entered into the regression equation together and the β value of the predictor variable is reduced to zero, or near zero, and becomes non-significant (Efron & Tibshirani, 1993; Kenny, 2012; Shrout & Bolger, 2002). In this study, the β value decreased from β = .01, p = .018, to β = .002, p = .597, but standardized c was very small (< .2), signifying that this value was unstable (Kenny, 2012).

However, few demonstrate complete mediation, and it is recommended to use several mathematical equations to analyze the unstandardized beta values to determine the extent of mediation (see Chapter 4). Kenny (2012) notes that in order to claim

complete mediation, the percent mediated should be at least 80%. In this study, values for percent mediated ranged from 77 – 78%.

In mediation analysis, power is also influenced by the test used for statistical analysis. As noted earlier, bootstrapping is highly regarded as the most powerful test of mediation (Fritz & MacKinnon, 2007; Kenny, 2012; Krause et al., 2010; Hayes, 2009; Zhao et al., 2009), and therefore added power to the results of this study. Reliability of the mediator (> .90) also strengthens the research findings. However, Kenny (2012) notes that it is not possible to compute the power of the test of the indirect effect.

In conclusion, complete mediation is not evident. However, emotional eating behavior is a moderate but significant mediator between role stress and obesity. Therefore, emotional eating behavior partially mediates the relations between role stress and obesity in clergy. As this research design was cross-sectional, and it is the first study to examine these relations, it is premature to claim much more than that these are important findings that should be studied in greater detail.

Feedback from Clergy.

Comments were allowed at the end of the survey. Some of these on role stress were mentioned earlier; other comments included:

> "Having served 42 years in the teaching/preaching ministry I think I've seen some of your potential results in the lives of way too many pastors"

> "Regarding the eating when I am stressed, I am the opposite. I tend to eat little to nothing when I am stressed. Maybe one meal a day. So while I do not gain weight during stress, I lose weight unhealthily during times of great stress. It might also have been a good question to ask about the amount of stress outside of the church that a person is undergoing to get a full picture."

"The dissatisfaction that comes is the heavy work load at the church and school that I serve at. I do love what I do, but just do not get much down time to relax. While I do eat dinner at home most nights, a lot of those nights are dinner at 9 pm after meetings so I can eat with my wife. This last 'Call' which has gone on for 8 years has really changed our eating schedule with all that is happening at the church and school since I am the Senior Pastor of a large congregation and a school."

"Probably 2-3 times per month I think of either early retirement or 'what else could I be doing other than congregational ministry?' The Christian ministry is the worst of all trades, but the best of all professions."

"Thanks for putting in the time and effort for Clergy health!"

Chapter VI

Summary, Conclusions, and Recommendations

Overview

The aim of this cross-sectional, randomized study of 430 LCMS clergy was to examine the relations between role stress, eating behaviors (emotional and restrained), and obesity. Theoretical underpinnings of the Neuman Systems Model (Neuman, 2011) and Kahn and colleagues (1964) role stress theory linked these variables. It was hypothesized that eating behaviors (emotional and restrained) would mediate the relation between role stress and obesity. Self-administered, web-based tools included: the Role Conflict and Ambiguity Scales (Rizzo et al., 1970), Emotional and Restrained Eating Behavior Scales from the Dutch Eating Behavior Questionnaire (Van Strien, Frijters, Bergers et al., 1986), self-reported height and weight for BMI calculation and subsequent BMI grouping. Questions from the Behavioral Risk Factor Surveillance System (CDC, 2010d) survey and clergy role and demographic questions were asked.

Summary of the Findings

Emotional eating behavior partially mediates (approximately 77 – 78%) the relation between role stress and obesity in LCMS clergy. However, restrained eating behavior was not a mediator of this relation. Restrained eating behavior was not related to role stress nor indeed any indicator of role complexity, yet had a small but statistically significant relation to obesity. Although not hypothesized, restrained eating behavior was found to moderate the relation between emotional eating and obesity.

As hypothesized, obesity was high (36.7%) in this clergy sample, twice that expected in highly educated males. Overweight rates were also high (44.7%), and the

combined overweight/obesity rate was 81.4%. In fact, only 18.6% of clergy had a normal BMI. These rates were higher than the US population of non-Hispanic White males and obesity rates reported in older studies of clergy (Carroll et al., 2001; Halaas, 2002), but similar to the high rate of obesity found in a recent study of UMC clergy (Proeschold-Bell & LeGrand, 2010). Comparisons were made of BMI at three life points (high school graduation, seminary graduation, and present day), and it appears that increased BMI began in seminary, and thereafter continued to increase.

It was expected that role stress would be high in clergy and instead role stress was moderate. Clergy role stressors that increased role stress included low social support, financial worry, not having a job description, and low frequency of socializing with congregants. Of these stressors, low social support was the most significant contributor to clergy role stress.

There was a small but significant relation found between role stress and obesity ($r = .11$, $p = .02$), which was most likely related to the large sample size. However, it is also likely that this relation was affected by the temporal order of events. That is, the study variables occur at different points in time. Thus, role stress may indeed lead to emotional eating and obesity, however when role stress diminishes, weight is not lost.

Conclusions

These findings support conceptual and theoretical linkages between the Neuman's System Model (Neuman, 2011) and Kahn's role stress theory (Kahn et al., 1964). Invasion of the normal line of defense (clergy role stress) activates the lines of resistance (coping through emotional eating behavior) and then leads to a core response (obesity). It is concluded that LCMS clergy have extremely high obesity rates and are thus at high

risk for related health consequences. Remarkably, high rates of obesity in clergy have been reported, yet only one study to date has investigated the health consequences of obesity in clergy (Proeschold-Bell & LeGrand, 2010). The present study is the first to study the antecedents of obesity in clergy.

Though emotional eating, and not restrained eating, was found to be the foremost contributor to obesity, the relations between emotional and restrained eating and their consequent impact on obesity must not be overlooked. In fact, restrained eating was found to moderate the relation between emotional eating and obesity. Thus it is concluded that, although emotional eating behavior was identified as the most important variable in understanding eating's relations to obesity (O'Connor et al., 2008), the interaction between emotional and restrained eating deserves careful attention. Identification of emotional eating as the most important variable likely results from the amount of attention it has received. In fact, emotional eating behavior was the sole focus in a number of studies (Konttinen et al., 2010; Larsen et al., 2006; Schneider et al., 2012; Van Strien, Herman, Anschutz et al., 2012). To date, the main and interaction effects of restrained eating have been largely neglected.

Though role stress was moderate in this sample of clergy it is evident from their comments and from ancillary analysis of clergy role stressors that the clergy role is a stressful one. Indeed, low social support is the major role stressor in this population. In their comments, clergy identified major difficulties and little help to manage them.

Implications

Implications for model development. As noted, theoretical linkages between the NSM (Neuman, 2011) and Kahn and colleagues (1964) role stress theory were supported. Study of obesity as a core response provided a significant contribution to further development of Neuman's model. Additionally, revisions to empirical testing of the proposed mediated relations (Gigliotti, 1997) between invasion of the normal line of defense, the lines of resistance, and the core response were identified.

Specifically, testing of the mediated relations in the NSM (Neuman, 2011) was first described by Gigliotti (1997) using the four causal steps of mediation. At that time, the first step was required to be significant, however this statistical significance at step one is no longer required (Kenny, 2012; Kenny, Kashy, & Bolger, 1998; MacKinnon et al., 2000; Preacher & Hayes, 2008a; Shrout & Bolger, 2002). Therefore, as mediation is a measure of the indirect effect, normal line of defense invasion may be related to activation of the lines of resistance, and the lines of resistance may be linked to a core response. However, it is not necessary to directly link normal line of defense invasion to the core response. What is being measured is the indirect effect of normal line of defense invasion on the core. Also, it is now recommended to start with the causal steps of mediation (Kenny, 2012). Analysis should ultimately include bootstrapping, as this is the most powerful test of the indirect effect (Kenny, 2012; Krause et al., 2010; Preacher & Hayes, 2008a; Shrout & Bolger, 2002).

Implications for nursing practice. This study also provides a valuable contribution to nursing practice. The important relations between role stress, emotional eating behavior, and obesity should inform nurse researchers working to find solutions to

the current obesity epidemic. Also important was the finding of restrained eating behavior as a modifier of the relations between emotional eating behavior and obesity.

This information may be used in planning and implementing health promotion and weight management programs. For example, teaching individuals to identify and cope with experienced emotions could lead to less emotional eating, and decrease the risk for obesity. Current trends in obesity management include increased fruit/vegetable consumption, a low fat diet, and increased physical activity. These are negatively correlated with emotional eating and thus research and interventions should be directed at emotional eating behavior. Additionally, as restrained eating behavior was identified as a moderator of emotional eating, strategies to effectively utilize restrained behavior could be identified. Addressing the interaction effects of emotional and restrained eating is an over-looked aspect of obesity prevention and intervention.

This knowledge will increase nurses' and other health care professionals' understanding of the role that eating behaviors play in the development of obesity. Concern about the growing problem of obesity in the US is reflected in statements within Healthy People 2020 (USDHHS, 2010), which aims to decrease the proportion of adults who are obese, and increase the proportion of adults who are at a healthy weight. Additionally, the National Institute of Nursing Research Strategic Plan calls for creative solutions to rising rates of obesity, as well as other health problems (NINR, 2011).

Implications for clergy. The greatest significance of this study lies in its contribution to knowledge about the health of clergy. Although clergy were identified as having some positive health habits, such as not smoking or binge drinking, they have moderate role stress. Clergy cope with role stress through emotional eating, leading to

obesity. They have also been identified, in this study and others, as having significant health problems related to obesity, such as hypertension, diabetes, high cholesterol, and depression (Halaas, 2002; Proeschold-Bell & LeGrand, 2010). Also important was the identification of significant stressors, formerly identified in clergy literature and now linked with role stress: low social support, financial worry, not having a job description, and low socialization with congregants. Although clergy are discouraged from socializing with congregants (R. Hesse, personal communication, February 1, 2011), low socialization may be an indicator of conflict between the congregation and clergy.

Implications for health care disparities. As noted earlier, clergy have been identified as community leaders, with great potential to influence the health of others through role modeling positive health behaviors, planning community health initiatives and talking about health (Catanzaro et al., 2006; Hale & Bennett, 2003). In fact, clergy are often the gatekeepers of mental health services, and may be the only counselor available to some individuals (Wang, Berglund, & Kessler, 2003). Clergy are the people that individuals turn to when they have no other resources, and have greater routine contact with the community than health care providers. Therefore, addressing health of clergy may impact the health of those who have the greatest needs.

An exemplar of the clergy role in health promotion is the Bronx (NY) REACH program (Racial and Ethnic Approaches to Community Health), which seeks to use the capacity and resources of local faith-based institutions to change the knowledge, attitudes, and behavior of community members concerning health promotion, disease self-management, and navigation of the health care system (Kaplan et al., 2009). The success of this program, now implemented in 17 churches of various denominations over

a four year period, is reflected in a recent award of an NIH grant to expand this program to additional churches. Although the health of clergy members participating in this program was not discussed, linking health messages to sermons was, and is exemplified in this clergy comment:

> "It was Bronx Health REACH that inspired me to preach that sermon…I wanted my brothers and sisters…to embrace their good health from a spiritual perspective …that this body houses the Holy Spirit, that that makes it a very, very special and sacred chapel that we are to revere in the same way that we want to take care of this (church) building…yet it has been okay for us to fill our bodies with garbage…we wouldn't take garbage and dump it on the church floor."

Although use of churches for promoting community health is an effective method for reaching members of the community, this message may be distorted when the clergyperson is obese and/or un-healthy. It gives the message that an un-healthy body is acceptable, as long as the mind and spirit are in the right place. Therefore, addressing clergy health may be important for community health.

Study Limitations

Generalizability of the study findings to other populations may be limited by the narrow delimitations of the sample. That is, the participants in this study were all male, married, non-Hispanic White clergy with Master's degrees. However, this group appears to be a good representation of clergy in general, as the stressors that were significantly correlated with role stress were the same or similar to stressors identified in numerous other clergy populations (Bleiberg, 1998; Hoge & Wenger, 2005; Meek et al., 2003; Ok, 2009; Proeschold-Bell & LeGrand, 2010; Verdieck et al., 1988; Virginia, 1998).

Generalization of this study's findings to female clergy is not possible. Males and females demonstrate different patterns of lifetime weight gain (Flegal et al., 2010), and so

it is possible that they experience emotional eating behavior differently. Female clergy also enjoy greater support from their congregations than male clergy (McDuff & Mueller, 1999). As low social support was found to be significantly correlated with role stress, male and female clergy may experience stressors and role stress differently as well.

It is also not possible to generalize the findings of this study to non-white clergy. It is not known how many non-white clergy were contacted, as LCMS race/ethnicity data were not available. Unfortunately, the number of non-white clergy in this sample was low (1.2%). The study variables were examined with and without non-white participants, and as there was no difference in the results, they were included in the study. However, research on non-white clergy is warranted as obesity is higher in non-white individuals.

The findings of this study are also limited by the cross-sectional design, and as the first to identify significant relations between role stress, emotional eating behavior, and obesity. As noted earlier, when little is known about theoretically linked variables, cross-sectional study design is appropriate to test the linkages. However, to verify these findings, longitudinal study is recommended (Gelfand et al., 2009). These linkages (role stress, emotional eating behavior, obesity) should be tested in other populations as well.

Measurement of abdominal adiposity was also limited by the study design. Collecting data via the internet allowed for a large, nationwide sample, however, it was not possible to collect data on abdominal adiposity in this manner. As visceral fat, that which constitutes abdominal adiposity, is highly related to morbidity and mortality, more information is needed on this measure in clergy. Self-report of height and weight was used in all clergy studies, and none included measurement of abdominal adiposity.

Important relations between role stress, eating behaviors, and obesity were identified in this study. Important also was identification of stressors related to role stress, and health consequences of obesity in LCMS clergy. As this research design was cross-sectional, and the first study to examine these relations, it is premature to claim much more than that these are important findings that should be studied in greater detail.

Recommendations for Future Research

Recommendations were noted as this study progressed. Some were noted as the data were collected, such as asking about nationality. Other ideas came during data analysis, such as needing to know more about interactions between emotional and restrained eating, and measuring abdominal adiposity. Lastly, ideas came at the conclusion of the study, such as self-identification of linkages between emotions and hunger, and needing more research on clergy and development of a clergy role stress tool.

Nationality. Questions on nationality and amount of time spent living outside of the US were not considered during study design however, one clergyman made this point when he mentioned his immigration to the US. It is evident that national culture and food availability impact food choices, as well as ideal body image, and thereby BMI. Therefore, questions on nationality, immigration, culture, and missionary work should be considered, in addition to race/ethnicity.

Restrained eating behavior. Restrained eating behavior was conceptualized as a coping behavior. That is, restrained eaters eat more when distracted and then increase restrained behavior (Herman & Mack, 1975; Herman & Polivy, 1975). It was proposed that the complexity of the clergy role would contribute to an increase in restrained eating behavior, however, no significant relations were found.

Conceptually, restrained eating behavior precedes role stress. Therefore, in future research, individuals with high restrained behavior might be identified, and then their ability to restrain food intake during high role stress could be measured. The finding of restrained eating behavior as a moderator of the relations between emotional eating behavior and obesity suggests that more research is needed on the interaction between these two eating behaviors as well. Numerous studies have documented the co-existence of these two behaviors (Elfhag & Morey, 2008; Koenders & Van Strien, 2011; Wardle, 1987; Wong et al., 2009), but not their interactions. The interaction between these behaviors needs to be fully explicated in future studies.

Abdominal adiposity. Clergy were asked to report their belt/pants waist size as a measure of abdominal adiposity. Additionally, they were asked whether the "belly extended beyond the belt." Surprisingly, although obesity rates were high, the mean waist size was below the critical value of 40 inches, which signifies abdominal adiposity (M = 37.8, range 29 – 54). Additionally, 72% reported that the "belly" did extend beyond the belt. Therefore, solutions to accurately describe self-report of abdominal adiposity are needed to better describe the contributions of this variable.

Emotional eating behavior. One clergy member commented that he was unsure about the linkage between feelings and hunger. This makes sense as Bruch (1964) and Slochower (1987) posit that emotional eating behavior represents eating in response to both clearly labeled and diffuse emotions, and that emotional eaters are unable to accurately label their emotional states. The emotional eater feels hunger when faced with certain emotions, and may be unaware of the linkage between these relations. Therefore,

for future research, it would be beneficial to ask participants to consider their feelings when experiencing hunger for a set period prior to participating in research.

For example, the participant may be asked to keep an eating journal for 2 weeks prior to the study period. The participant would be asked to pause when feelings of hunger are experienced, and identify other feelings that are experienced at the same time as hunger, such as anger or frustration. The participant would also be asked to write down the event that happened prior to "feeling hungry." This may provide greater awareness of emotional eating behavior, and perhaps affect scores on this scale.

Clergy role stress. More research is needed on the relations between clergy stressors and role stress. Numerous clergy stressors were noted in the literature (Bleiberg, 1998; Gleason, 1977; Hoge & Wenger, 2005; Kay, 2000; Kemery, 2006; Lee, 1994; Meek et al., 2003; Monahan, 1999; Proeschold-Bell et al., 2009; Virginia, 1998), and in ancillary analysis. Two themes were identified: role complexity and social issues. It is clear that more work is needed on understanding the impact of stressors and role stress on clergy. Ideally, development of a clergy role stress tool would provide a wealth of information and facilitate future descriptive and intervention studies. It is possible that measurement of life stressors and personality attributes would also provide more insight into clergy stressors. Research on clergy also needs to be longitudinal in design, as there are few longitudinal studies involving clergy, and none were found on the relations in this study. Studies are also needed on female and non-white clergy.

Clergy intervention. This study and others (Halaas, 2002; Proeschold-Bell & LeGrand, 2010) have demonstrated high rates of obesity, and obesity related health risks in clergy such as hypertension, diabetes, high cholesterol, and depression. Therefore,

intervention is needed. Interventions might be designed around use of the internet, as clergy have demonstrated their proficient use of technology in this study and others (Halaas, 2002). For example, Christian clergy might be reached with positive health messages on self-care and eating behavior awareness during or immediately after Lent. Clergy could be asked to reflect on a daily health message for a period of forty days.

Impact of clergy health on congregations. Although clergy have been identified as having potential to impact the health of others, demonstrated in the Bronx REACH program (Kaplan et al., 2009), the impact of clergy health on the health of congregations has not been measured. Reverend Hartwell, a clergy advisor (personal communication, April 11, 2012) shared his feelings about his 100 pound weight loss:

> "When I made the commitment to lose weight, others did too. Over 100 congregants made a commitment to lose weight, and at least 3 people in my congregation lost over 50 pounds… and have maintained that weight loss. I feel that my weight loss changed the culture of the church...at coffee hour I see more fruit and protein. When people see my wife and I walking, or they see me running, they say that they feel inspired by us."

This is only one example of the positive impact clergy could have on the health, well-being, and lives of their congregations, which should be measured.

Although clergy have the power to positively impact the health of their communities and congregations, they must first focus on their own needs. It is often easier and perhaps more rewarding to focus on the needs of others. However, as evidenced by the results of this study, it appears that clergy do not care very well for themselves. Therefore, research and interventions are needed in this important, yet seldom studied group. This final comment best depicts the clergy perspective:

"Too often we think that because we serve the Lord we are like 'Superman' and can eat anything - go forever without a day off, and leap huge piles of committee/board agendas and not have it take a toll on our mental, physical, and even spiritual health."

Appendices

Appendix A

Neuman System's Model

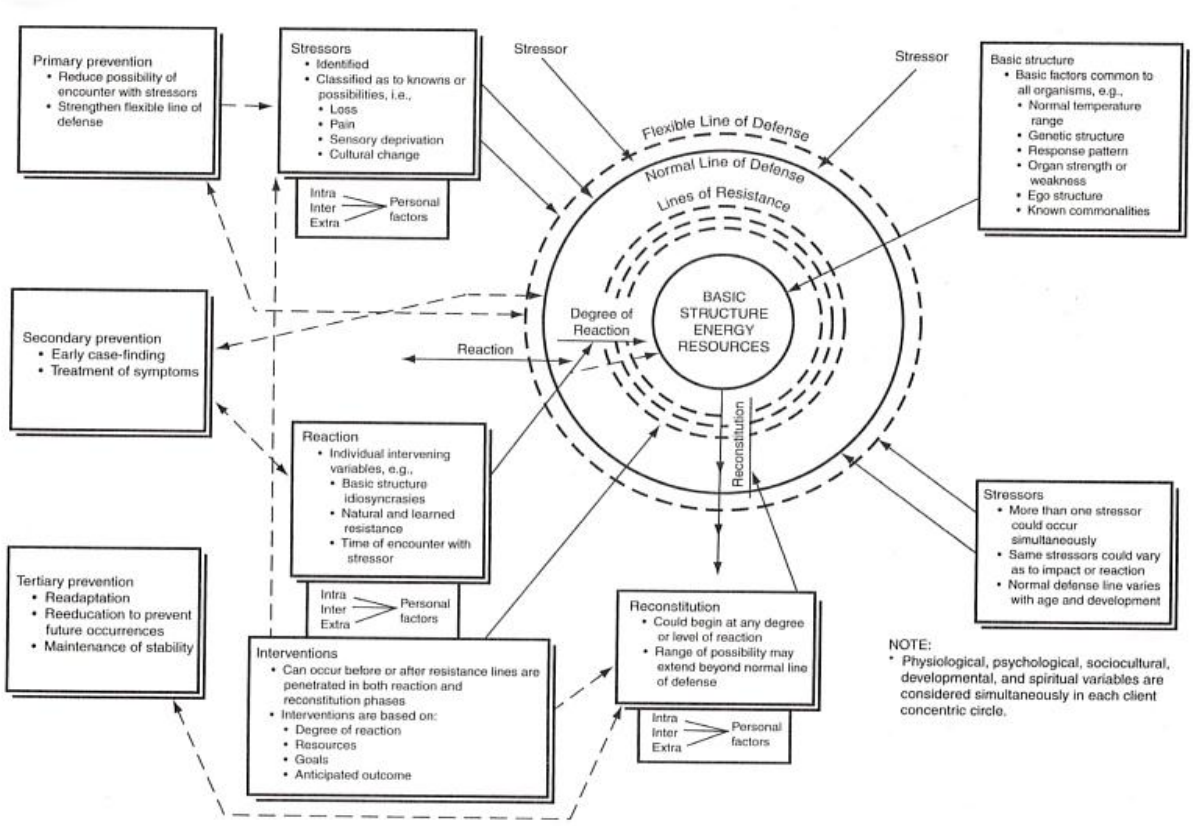


FIGURE 1-3. The Neuman Systems Model. *(Original diagram copyright © 1970 by Betty Neuman.)*

Credit: Neuman, B. & Fawcett, J. The Neuman Systems Model, 5th Edition, © 2011.

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Appendix A (continued)

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April 13, 2012

PE Ref # 169040

Nancy Kavanagh Manister
27 Anpell Drive
Scarsdale, NY 10583

Dear Nancy Kavanagh Manister:

You have our permission to include content from our text, ***THE NEUMAN SYSTEMS MODEL, 5th Ed. by NEUMAN, BETTY; FAWCETT, JACQUELINE,*** in your dissertation for your course at City University New York.

Content to be included is:
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Sincerely,

Celia Traverso, Permission Administrator

Appendix B

Conceptual-Theoretical-Empirical Structure

Neuman's Concepts	→	Environmental Stressors	Normal Line of Defense Invasion	Lines of Resistance	Core Response
		‖	‖	‖	‖
Kahn et al.'s Grand Theory	→	Objective Role Conditions	Experienced Role Stress	Personal Characteristics	Role Strain
		|	|	|	|
Theoretical Linkages	→	Being an LCMS clergyman	Role Stress	Eating Behaviors	Obesity
		⋮	⋮	⋮	⋮
Empirical Indicators	→	Sample Delimitations	Role Conflict and Ambiguity Scales	Dutch Behavior Eating Scale	BMI

Legend*:

‖ = denotes moving from model concept to grand theory concept

| = *denotes moving from grand theory concept to theoretical linkages*

⋮ = denotes moving from theoretical linkages to empirical indicators

*Fawcett, J. (2000). *Analysis and Evaluation of Contemporary Nursing Knowledge: Nursing Models and Theories.* Philadelphia: F.A. Davis

Appendix C

Role Conflict and Ambiguity Scales (RCAS)

Role Ambiguity Questions

1. I have clear, planned goals and objectives for my job.
2. I know that I have divided my time properly.
3. I know what my responsibilities are.
4. I know exactly what is expected of me.
5. I feel certain about how much authority I have on the job.
6. Explanation is clear of what has to be done.
7. I have to do things that should be done differently under different conditions.
8. I receive an assignment without the manpower to complete it.

Role Conflict Questions

9. I have to buck a rule or policy in order to carry out an assignment.
10. I work with two or more groups who operate quite differently.
11. I receive incompatible requests from two or more people.
12. I do things that are apt to be accepted by one person and not by others.
13. I receive an assignment without adequate resources and materials to execute it.
14. I work on unnecessary things.

This scale is scored on a 7-point Likert scale.

1 = Definitely not true
2 = Rarely true
3 = Occasionally true
4 = Neither true or not true
5 = Somewhat true
6 = Very true
7 = Extremely true

Appendix D

Boom test uitgevers
Postbus 15970
1001 NL Amsterdam
telefoon (020) 521 89 37
fax (020) 625 33 27
info@boomtestuitgevers.nl
www.boomtestuitgevers.nl

City University New York (CUNY)/ The Graduate Center
Eileen Gigliotti, RN, PhD, Nursing
365 Fifth Avenue
New York, New York 10016-4309
USA
Nursing – Doctorate in Nursing Science
Nancy Kavanagh Manister DNS©, FNP
(Department of Nursing)
6301 Riverdale Ave
Riverdale, New York 10471
USA

Subject	**Supplement(s)**	**Date**
License agreement DEBQ	-	September 27th 2010
Ref.	**Phone**	**E-mail**
10b1100jr	00 31 20 52 44 513	b.vanoel@boomtestuitgevers.nl

Dear Mrs. Kavanagh Manister,

Hereby we grant you a temporary permission to use the Dutch Eating Behaviour Questionnaire (DEBQ) of our author Dr. Tatjana van Strien. This license holds exclusively for the benefit of the below mentioned study:

Subject of the study: The relations among role stress, eating behaviors, and obesity in congregational clergy.
Institution: City University New York (CUNY), Nursing, Eileen Gigliotti, RN, PhD
Researcher: Nancy Kavanagh Manister DNS©, FNP
Period of use: The DEBQ will be used with 1272 subjects from (anticipated) May 2011 to August 2011.

Once the following restrictions are met, you may proceed with data collection using the DEBQ.

This license agreement is subject to the following restrictions:

1. This permission is valid exclusively for the benefit of the above mentioned study.
2. This permission is valid exclusively for research within the above mentioned institution.
3. This permission holds for the above mentioned number of copies.
4. This permission holds for a limited period, as mentioned above as 'period of use'.
5. At all times, the official version of the DEBQ, Emotional and Restrained scales only (23 items), will be used and/or printed.
6. Any and all materials used will contain the following credit line: *Dutch Eating Behaviour Questionnaire 2005 (DEBQ). Adapted and reproduced by special permission of the Publisher, Boom test publishers, Amsterdam, The Netherlands, for the DEBQ, copyright 2005 by Dr. T. van Strien p/a Boom test publishers, Amsterdam. This material is copyright protected and further reproduction is prohibited without permission in writing from the publisher.*
7. Boom test publishers will receive two copies of the DEBQ as printed for the benefit of the above mentioned study.
8. After completion of the study, all the materials must be destroyed.
9. You are explicitly not allowed to reproduce neither the DEBQ, nor the individual test items in any publication whatsoever.

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One copy of this license agreement should be signed and returned to me to indicate that you agree with the above restrictions. After receiving the signed agreement we will send you the DEBQ.

Sincerely,
Boom test publishers
Amsterdam, 16 mei 2011

Bregje van Oel
Publishing assistant

City University New York (CUNY)
The Graduate Center
Doctorate in Nursing Science Program
365 Fifth Avenue
New York, New York 10016-4309
September 26, 2010

Nancy Kavanagh Manister DNS©, FNP
Department of Nursing
6301 Riverdale Ave
Riverdale, New York 10471
NNKNP@aol.com

cc.: Geert van der Meulen (publisher)

Appendix E

Demographic Questions - Health

1. Would you say that in general, your health is?
   1._____Excellent
   2._____Very good
   3._____Good
   4._____Fair
   5._____Poor

2. What is your current height?
   (Choice buttons from: 4 feet 5 inches or less to 6 feet 6 inches or more)

3. What is your current weight?
   Please write your weight in pounds, using a whole number.
   Example: 190 or 280. (Please do not write pounds or lbs.)

4. What is your age?
   Please write your age in years_____.

5. Are you Hispanic or Latino?
   1._____Yes
   2._____No

6. Which one or more of the following would you say is your race?
   (Please choose all that apply.)
   1._____White
   2._____Black or African American
   3._____Asian
   4._____Native Hawaiian or Other Pacific Islander
   5._____American Indian or Alaska Native
   6._____Other. Please specify_____

7. What is your current marital status?
   Please choose only one answer that best describes your current status.
   1._____Married
   2._____Divorced
   3._____Widowed
   4._____Separated
   5._____Never married

8. How many adults, age 18 or older, live with you at home?
(Please choose the number of ADULTS OVER THE AGE OF 18 who live at home with you. Please include children age 18 or older, as well as children that live away at school part of the year.)

_____1 _____4
_____2 _____5
_____3 _____6 Other_____

9. How many children less than 18 years of age live in your household?
Please include children that live away at school for part of the year.

_____1 _____4 _____7
_____2 _____5
_____3 _____6
Other_____

10. During the past month, how many days did you participate in any physical activities such as running, circuit training, exercise games, walking, golf, or gardening for exercise?

1._____Never
2._____Once a month
3._____Two to three times a month
4._____Once a week
5._____Two to four times per week
6._____Five or more times per week

11. What did you weigh when you graduated from high school?
Please write your weight in pounds, using a whole number.
Example: 190 or 280 (Please do not write pounds or lbs.)

12. What did you weigh when you graduated from seminary?
Please write your weight in pounds, using a whole number.
Example: 190 or 280 (Please do not write pounds or lbs.)

13. What is your current waist size? (The size of your pants waist or belt.)
Please write your waist size in inches_____

14. Does your "belly" extend beyond your belt?

1._____Yes, a little
2._____Yes, a lot
3._____No

15. Have you ever had weight loss surgery?

1._____Yes
2._____No

16. Do you have a history of anorexia or bulimia?
    1._____Yes
    2._____No

17. On average, how many hours do you sleep per night?
    1. _____Three to four hours
    2._____Five to six
    3._____ Seven to nine hours
    4._____ More than nine hours

18. Do you take naps?
    1. _____Yes, on most days per week
    2. _____Yes, 1 to 3 days per week
    3. _____Occasionally
    4. _____Very seldom
    5. _____Only if I am not feeling well
    6. _____Never

19. Not counting potatoes or corn, how many total servings of fruit and vegetable did you eat yesterday? A serving would equal one medium apple, a handful of broccoli, or a cup of carrots.
    _____1 _____4
    _____2 _____5
    _____3 _____6 or more

20. How often do you get the social support that you need?
    Example: Having close friends and family that you can count on.
    1._____Always
    2._____Usually
    3._____Sometimes
    4._____Rarely
    5._____Never

21. How often do you get the emotional support that you need?
    Example: Having opportunities to share your inner feelings.
    1._____Always
    2._____Usually
    3._____Sometimes
    4._____Rarely
    5._____Never

22. In general, how satisfied are you with your life?
    1._____Very satisfied
    2._____Satisfied
    3._____Neither satisfied or dissatisfied
    4._____Dissatisfied
    5._____Very dissatisfied

23. Have you EVER been told by a doctor or health care provider that you have diabetes?
    1._____Yes, type I diabetes
    2._____Yes, type II diabetes
    3._____Yes, but not sure which type of diabetes
    4._____No, ONLY pre-diabetes or borderline diabetes
    5._____No

24. Were you told on **two or more different visits** to a doctor or other health professional that you had high blood pressure?
    1._____Yes
    3._____No
    4._____Told I was borderline or pre-hypertensive

25. Have you EVER been told by a doctor, nurse or other health professional that your blood cholesterol is high?
    1._____Yes
    2._____No
    3._____Told my cholesterol was borderline high

26. Do you now smoke cigarettes every day, some days, or not at all?
    1._____Every day
    2._____Some days
    3._____Not at all

27. Do you smoke anything **other than** cigarettes or do you chew tobacco? Please choose all that apply.
    1._____Yes, smoke variety of other products
    2._____No
    3._____Yes, pipe smoker
    4._____Yes, cigar smoker
    5._____Yes, chew tobacco
    6._____Yes, other substances

28. During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage (excluding communion)? Please choose ONLY one answer, and either write in a number or place an "X" next to your answer.

    1._____Days per week (write in a number)
    2._____Days in past 30 days
    3._____No drinks in past 30 days

29. One drink is equivalent to a 12-ounce beer, a 5-ounce glass of wine, or a drink with one shot of liquor. During the past 30 days, on the days when you drank, about how many drinks did you drink on average (excluding communion)?

    Number of drinks on average_____(write in a number).

30. During the past 30 days, what is the largest number of drinks you had on any occasion?

    Number of drinks _____ (write in a number).

31. Do personal financial problems cause you stress or anxiety?

    1._____Always
    2._____Usually
    3._____Sometimes
    4._____Rarely
    5._____Never

32. What is your individual annual income (not including a housing stipend)?

    1._____Less than $25,000.
    2._____$25,000. to $50,000.
    3._____$50,000. to $75,000.
    4._____$75,000. to $100,000.
    7._____More than $100,000.

Demographic Questions – Clergy Role

1. What is the highest grade or year of school that you completed?
   Please choose only one answer.
   1._____Completed Baccalaureate degree
   2._____Completed Master's degree
   3._____Completed Master's degree, study for Doctoral degree in progress
   3._____Completed Doctoral degree

2. Do you have responsibilities for a church-based school?
   1._____Yes
   2._____No

3. Do you teach at a college or university?
   1._____Yes
   2._____No

Question added:
In order to know that responses from this survey accurately represent LCMS clergy in all regions of the United States, please choose the region in which you work:
Northeast
Midwest
South
West
Outside of the United States

4. Are you currently working as a congregational clergy?
   1._____ Currently serving as a sole pastor of one church
   2._____ Currently serving more than one church as a sole pastor
   3._____ Currently serving as a senior pastor of a church
   4._____ Currently serving as an associate pastor of a church
   5._____ Currently serving as an assistant pastor of a church
   6._____Currently not working as a congregational pastor.

(*Note: If participant answers number 6 to question 2, the survey will branch and end, and a thank you message will appear.)

5. What is the average number of congregants who attend church services at your church or churches each week?
   1._____Less than 50
   2._____50 to 100
   3._____100 to 15
   4._____150 to 200
   5._____200 to 250
   6._____over 250

6. How many members does your church have? If serving more than one church, please combine church members from all churches.
    1._____Less than 100
    2._____ 100 to 250
    3._____ 250 to 500
    4._____500 to 1000
    5._____1000 to 1,500
    6._____ 1,500 to 2,000
    7._____ over 2,000

7. How many evenings per week, on average, do you have a meeting, prayer service, or other church related responsibility?
    1._____1 to 2 evenings per week
    2._____3 to 4 evenings per week
    3._____5 to 6 evenings per week
    4._____7 evenings per week

8. In the last month, how many evenings per week, on average, did you eat dinner outside of your home?
    1._____1 evening or less per week
    2._____1 to 2 evenings per week
    3._____3 to 4 evenings per week
    4._____5 to 6 evenings per week
    5._____7 evenings per week

9. Do you have one or more officially trained lay people, commissioned deacons, lay ministers, or youth workers who work with you?
    1._____Yes
    2._____No

10. Do you have a job description?
    1._____Yes
    2._____No

11. Does your current appointment provide a residence for you to live in?
    1._____Yes
    2._____No

12. Does your current appointment provide a housing stipend?
    1._____Yes
    2._____No

13. My current housing arrangements are satisfactory.
    1._____Yes
    2._____No

14. How often do you socialize with members of your current congregation, un-related to church business?
    1._____more than 3 times per week
    1._____2 or 3 times per week
    2._____once per week
    3._____1 to 3 times per month
    4._____2 or 3 times per year
    5._____rarely or never

15. How many years ago did you graduate from seminary?
    Please write in a whole number.
    Example: 3 or 12. (Please do not write the word years).

16. How many years total have you worked as a congregational clergy?
    Please write in a whole number.
    Example: 5 or 15. (Please do not write the word years).

17. Please choose the description which best describes your career path to seminary:
    Please choose all that apply.

    _____I went to seminary right after college.
    _____I went to seminary after attending graduate school first.
    _____I went to seminary after attending graduate school and having another career first.
    _____I went to seminary after having another career first
    _____Other _____

19. Which of the following best describes your career path to the congregational clergy role?
    I became a congregational clergy right after seminary
    I became a congregational clergy right after seminary, and have moved in and out of the congregational clergy role
    I held other positions before I became a congregational clergy
    I held other positions before I became a congregational clergy, and I have moved in and out of the congregational clergy role.

Appendix F

Office of the Vice President for Research and Sponsored Programs
Committee on the Protection of Human Subjects

The Graduate School and University Center
The City University of New York
365 Fifth Avenue
New York, NY 10016-4309
TEL 212.817.7523 FAX 212.817.1629

TO: Ms. Nancy Manister
Nursing DNS

FROM: Richard G. Schwartz, Ph.D.
Chairperson
Graduate Center IRB

SUBJECT: IRB Approval - Exemption

DATE: June 21, 2011

STUDY: **11-05-124-0135 Role stress, eating behaviors, and obesity among clergy.**

The Graduate Center IRB has approved the above study involving humans as research subjects. This project is Approved - Exempt Category: 2 - under 45 CFR 46.

IRB Number: **11-05-124-0135** This number is a Graduate Center IRB number that should be used on all correspondence with the IRB regarding this study.

Approval Date: **June 21, 2011**
Expiration Date: **June 20, 2014**

NONRENEWABLE. APPROVAL OF EXEMPT RESEARCH IS NONRENEWABLE. THE DURATION OF STUDY FOR EXEMPT RESEARCH IS LIMITED TO THAT SPECIFIED ON THE APPROVED APPLICATION, NOT TO EXCEED THREE YEARS. INVESTIGATORS WISHING TO CONTINUE EXEMPT RESEARCH BEYOND THE PERIOD SPECIFIED ON THE APPROVED APPLICATION MUST SUBMIT A NEW APPLICATION TO THE IRB FOR APPROVAL AT THE *CONCLUSION OF THE ORIGINAL PERIOD.*

Consent Form: If you are using a consent form, all research subjects must use the approved and stamped consent form. You are responsible for maintaining signed consent forms for each research subject for a period of at least three years after study completion.

Mandatory Reporting to the IRB: The principal investigator must report, within five business days, any serious problem, adverse effect, or outcome that occurs with frequency or degree of severity greater than that anticipated. In addition, the principal investigator must report any event or series of events that prompt the temporary or permanent suspension of a research project involving human subjects or any deviations

from the approved protocol.

Amendments/Modifications: All amendments/modifications of protocols involving human subjects must have prior IRB approval, except those involving the prevention of immediate harm to a subject. Amendments/modifications for the prevention of immediate harm to a subject must be reported within 24 hours to the IRB.

If you have any questions, please feel free to contact Kay Powell in the IRB Office at 212-817-7525.

Good luck on your project.

cc: Eileen Gigliotti Ph.D.
Clinical Doctoral Programs

Sign the Verification Statement below. Return the original signed copy of this memo to the IRB Office and retain a copy for your records. The IRB Office must receive a copy of the signed verification statement before research may begin.

VERIFICATION:

BY SIGNING BELOW, I ACKNOWLEDGE THAT I HAVE RECEIVED THIS APPROVAL AND AM AWARE OF, AND AGREE TO ABIDE BY, ALL OF ITS STIPULATIONS IN ORDER TO MAINTAIN ACTIVE APPROVAL STATUS, INCLUDING TIMELY SUBMISSION OF CONTINUING REVIEW APPLICATIONS AND PROPOSED PROTOCOL MODIFICATIONS, AS WELL AS PROMPT REPORTING OF ADVERSE EVENTS, SERIOUS UNANTICIPATED PROBLEMS, AND PROTOCOL DEVIATIONS. I AM AWARE THAT IT IS MY RESPONSIBILITY TO BE KNOWLEDGEABLE OF ALL FEDERAL, STATE AND UNIVERSITY REGULATIONS REGARDING HUMAN SUBJECTS RESEARCH INCLUDING CUNY'S FEDERALWIDE ASSURANCE (FWA) WITH THE DEPARTMENT OF HEALTH AND HUMAN SERVICES OFFICE OF HUMAN RESEARCH PROTECTIONS.

Karen M Manister — 6/21/11
Signature of Principal Investigator — Date

Eileen Gigliotti — 6/21/11
Signature of Faculty Advisor for Student Research — Date

Appendix G

THE LUTHERAN CHURCH–MISSOURI SYNOD

Office of Rosters and Statistics
1333 S. Kirkwood Rd.
St. Louis, MO 63122-7295
(314) 965-9000 Fax (314) 996-1133

April 11, 2011

Nancy Kavanagh Manister
6301 Riverdale Avenue
Riverdale, NY 10471

Dear Nancy:

The LCMS Office of Rosters and Statistics will be providing a random sampling of pastors with email addresses to send them a brief questionnaire regarding role stress and eating behaviors to study how these factors influence health.

This data is being made available with the following understanding:

1. Use of these emails is granted to Nancy Kavanagh Manister for the purpose of sending a brief questionnaire regarding role stress and eating behaviors to study how these factors influence health. You agree to accept responsibility for the appropriate use of this data.
2. Nancy Kavanagh Manister agrees that she will not use this data for mailing or communicating in any way with these pastors contained in this file other than what is stated in number 1, without the expressed, written consent of LCMS.
3. Duplication and/or Distribution in any format, written, electronic or otherwise, other than number 1 above, is forbidden without the expressed, written consent of The LCMS.
4. The data being provided is owned by The LCMS. Provision of this data for use by Nancy Kavanagh Manister does not constitute a transfer of ownership. The LCMS retains sole ownership of this data.
5. This data may not be assigned to any person or parties as a result of a change in the relationship between The LCMS and Nancy Kavanagh Manister.

If you have any questions please contact Mr. Gene Weeke, Director of Business Services for The Lutheran Church--Missouri Synod.

Agreed and Accepted by:

Gene Weeke
Director of Business Services

Agreed and Accepted by:

Nancy Kavanagh Manister
Student at The Graduate School and
University Center of New York

C: The Reverend Dr. Ray Hartwig
Secretary, The Lutheran Church—Missouri Synod

Appendix H

Village Lutheran Church
172 White Plains Road . Bronxville, NY 10708
Ph. 914.337.0207 . Fx. 914.771.9711
www.VLC-NY.ORG

Rev. Dr. Robert Hartwell, *Senior Pastor*
Rev. Roy Minnix, *Associate Pastor/Campus Pastor*

Or do you not know that your body is a temple of the Holy Spirit within you, which you have from God, and that you are not your own? For you were bought with a price; therefore glorify God in your body.
1 Corinthians 6:19-20

Rev. Dr. Robert Hartwell
Village Lutheran Church and The Chapel School
172 White Plains Road
Bronxville, New York 10708

Easter Season
April 24, 2011

Dear Brother in Christ:

I am writing to you to ask for your help for a parishioner at Village Lutheran Church, Nurse Practitioner - Nancy Kavanagh-Manister. She has been studying the health of clergy for several years, and is currently working on her doctoral dissertation in Nursing Science at City University New York (CUNY). She is performing a research study on clergy role stress and eating behaviors. There has, sadly, been little research done in this important area. I believe that Nancy's work could prove very beneficial and it is very important that pastors participate in this research study. To that end I am asking if you would graciously assist her in this study.

Next week, you will receive an email from Ms. Kavanagh-Manister from her email account (nkavanagh_manister@gc.cuny.edu) with a survey link attached. Your email address was obtained with permission from Lutheran Church-Missouri Synod and was chosen randomly from a list of all active LCMS clergy throughout the United States. She has reviewed the protocols for this survey with me. This survey is completely anonymous. No identifying information is included, and your email address will not be attached to the survey. Ms. Kavanagh-Manister and her adviser, Dr. Eileen Gigliotti, have assured me that information returned in this survey will be kept in the strictest of confidence, and no attempts will be made to identify any participants. The survey will take approximately 15-20 minutes to complete.

I know how busy your schedule can be. I also know how important this work is and your participation is so important.

May God bless you with His peace this holy season. I am grateful for your consideration and your partnership in the Gospel.

Sincerely Yours in Christ,
(Rev. Dr.) Robert Hartwell

Church Secretary Kim Rapillo | Development Assistant Jeanette Van Duyne | Minister of Music Deborah Reiss | Parish Health Dr. Joy Elwell | Crusader Youth Minister Kate Porter | Voyager Youth Minister Erika Schultz

Appendix I

Nancy Kavanagh Manister, DNS(c), FNP-BC
6301 Riverdale Avenue
Riverdale, New York 10471

June 27, 2011

Dear Pastor:

My name is Nancy Kavanagh Manister and I am a Nurse Practitioner. I am also a doctoral candidate at City University of New York (CUNY) in the Doctor of Nursing Science program. I am studying clergy health, and am writing to ask for your help in research that I am conducting. In particular, I am studying the relationships between role stress in clergy, and eating behaviors. Clergy are important community leaders, and so far, I have found that there is very little research on clergy health. Your participation is very important to my research, and information gathered from this survey will provide valuable information on clergy health.

Your email address was obtained with permission from Lutheran Church-Missouri Synod and was chosen randomly from a list of all active LCMS clergy throughout the United States. This survey is completely anonymous, and you will find as you complete the survey that no identifying information is asked. Additionally, when you complete the survey, your email address and your computer's identifying information (the IP address) will not be returned with your answers. All answers will be treated confidentially, and no attempt will be made to identify any pastor.

As this survey is completely anonymous, I will not know if you complete this survey. This means that all clergy will receive reminders to complete the survey, even if you have completed it. I apologize for this in advance, but please know that this was designed to protect your privacy. Please complete the survey only once.

If you have questions about this research, or would like to "unsubscribe" you can contact me at: LCMSCongregationalClergyStudy@gmail or (718) 405-3367, or my advisor, Dr. Eileen Gigliotti at Eileen.Gigliotti@csi.cuny.edu or (718-982-3819). If you have questions about your rights as a participant in this study, you can contact Kay Powell, IRB Administrator, The Graduate Center/City University of New York, (212) 817-7525, kpowell@gc.cuny.edu.

Here is the link to the survey: http://www.surveymonkey.com/s/NHBTLWH
You may click on the link, or cut and paste it into your browser in order to access the survey. Your participation in this research is completely voluntary, and will take approximately 15-20 minutes. The last day to complete the survey is June 15, 2011. Thank you in advance for your participation.

Yours truly,
Nancy Kavanagh Manister, DNS(c), FNP-BC

Appendix J
Follow-up letter #1

Nancy Kavanagh Manister, DNS(c), FNP-BC
6301 Riverdale Avenue
Riverdale, New York 10471

July 5, 2011

Dear Pastor:

Recently you should have received a request from me to complete a survey on clergy health. My name is Nancy Kavanagh Manister and I am a doctoral candidate in the Doctor of Nursing Science program at City University of New York (CUNY). I am studying clergy health, and am writing to ask for your help in research that I am conducting. In particular, I am studying the relationships between role stress in clergy and eating behaviors.

If you have already completed the survey, please accept my most sincere thanks for taking time from your busy work day to complete this survey. Your participation is very important to my research. If you have not completed the survey yet, I hope that you will be able to find time to do so. I will only be collecting data until (date).

Your email address was obtained with permission from Lutheran Church-Missouri Synod and was chosen randomly from a list of all active LCMS clergy throughout the United States. This survey is completely anonymous, and you will find as you complete the survey that no identifying information is asked. Additionally, when you complete the survey, your email address and your computer's identifying information (the IP address) will not be returned with your answers. All answers will be treated confidentially, and no attempt will be made to identify any pastor.

If you have questions about this research or would like to "unsubscribe," you can contact me at: LCMSCongregationalClergyStudy@gmail.com or (718) 405-3367, or my advisor, Dr. Eileen Gigliotti at Eileen.Gigliotti@csi.cuny.edu or (718-982-3819). If you have questions about your rights as a participant in this study, you can contact Kay Powell, IRB Administrator, The Graduate Center/City University of New York, (212) 817-7525, kpowell@gc.cuny.edu.

Here is the link to the survey: http://www.surveymonkey.com/s/NHBTLWH
You may click on the link, or cut and paste it into your browser in order to access the survey. Your participation in this research is completely voluntary, and will take approximately 15-20 minutes. The last day to complete the survey is June 15, 2011, and please only complete the survey once. Thank you in advance for your participation.

Yours truly,
Nancy Kavanagh Manister, DNS(c), FNP-BC

Appendix K
Follow-up letter #2

Nancy Kavanagh Manister, DNS(c), FNP-BC
6301 Riverdale Avenue
Riverdale, New York 10471

July 11, 2011

Dear Pastor:

Thank you for taking the time to read this e-mail. Recently you should have received a request from me to complete a survey on clergy health. My name is Nancy Kavanagh Manister and I am a doctoral candidate in the Doctor of Nursing Science program at City University of New York (CUNY). I am studying the relationships between role stress in clergy and eating behaviors, and am writing to ask for your help in research that I am conducting. As I have been studying the role of clergy, I realize that your schedule is very busy!

As I designed this survey to be completely anonymous, I have no way of knowing who has or has not completed the survey. If you have already completed the survey, please accept my most sincere thanks for taking time from your busy work day to complete this survey. Your participation is very important to my research. If you have not completed the survey yet, I hope that you will be able to find time to do so. I will only be collecting data until (date).

Your email address was obtained with permission from Lutheran Church-Missouri Synod and was chosen randomly from a list of all active LCMS clergy throughout the United States. This survey is completely anonymous, and you will find as you complete the survey that no identifying information is asked. Additionally, when you complete the survey, your email address and your computer's identifying information (the IP address) will not be returned with your answers. All answers will be treated confidentially, and no attempt will be made to identify any pastor.

If you have questions about this research, or would like to "unsubscribe," you can contact me at: LCMSCongregationalClergyStudy@gmail.com or (718) 405-3367, or my advisor, Dr. Eileen Gigliotti at Eileen.Gigliotti@csi.cuny.edu or (718-982-3819). If you have questions about your rights as a participant in this study, you can contact Kay Powell, IRB Administrator, The Graduate Center/City University of New York, (212) 817-7525, kpowell@gc.cuny.edu.

Here is the link to the survey: http://www.surveymonkey.com/s/NHBTLWH
You may click on the link, or cut and paste it into your browser in order to access the survey. Your participation in this research is completely voluntary, and will take approximately 15-20 minutes. The last day to complete the survey is June 15, 2011, and please only complete the survey once. Thank you in advance for your participation.

Yours truly,
Nancy Kavanagh Manister, DNS(c), FNP-BC

Appendix L

Protection of Survey Participants

To protect the survey participant, this survey was designed to be completely anonymous.

No identifying information, such as state or zip code, is asked in this survey. The "blind CC" feature will be used when sending emails to participants, and the procedure for gaining consent further protects the participant. (Procedure for consent: The participant may only access the survey by clicking on the survey link, and then the participant may read the consent and then click on the continue button, as tacit consent (with no signature) protects the anonymity of the participant.)

Additionally, SurveyMonkey provides for the protection of survey participants and data in the following safe-guards and procedures:

1. The researcher may specify that both the IP (identifying address of the computer) and the email address of the participant are not returned with or attached to the survey response.
2. The responses of survey respondents are transmitted over a secure, encrypted connection
3. The researcher must use a login and password to access survey information or data, and this is sent over a Secure Sockets Layer (SSL).
4. SurveyMonkey issues a session "cookie" only to record encrypted authentication information for the duration of a specific session. The session cookie does not include either the username or password of the researcher.

5. When the researcher accesses secured areas of the SurveyMonkey site, Secure Sockets Layer (SSL) technology protects the researcher information using both server authentication and data encryption, ensuring that research data is safe and secure.
6. IP connections are fully redundant, which means that power is switched if a cable were suddenly disconnected to prevent loss of continuity.
7. There are multiple independent connections to Tier 1 Internet access providers
8. Functionality of the SurveyMonkey site is monitored by staff for any downtime
9. Database is log-shipped to standby servers, which means that a secondary server is available (in less than an hour) if the primary system were unusable.
10. Firewall restricts access to all ports except 80 (http) and 443 (https), which are considered standard for firewall security.
11. Intrusion detection systems and other systems detect and prevent interference or access from outside intruders
12. Data is protected by SurveyMonkey through the following procedures:
    a. The data center is located in a SAS70 Type II certified facility
    b. The data center is staffed and digital surveillance equipment monitors the data center 24 hours a day
    c. The data center is secured by security guards, visitor logs, and entry requirements (passcards/biometric recognition)
    d. Servers are kept in a locked cage located in the US, and these have redundant internal and external power supplies to protect data.

e. The data center has environmental controls for temperature, humidity and smoke/fire detection

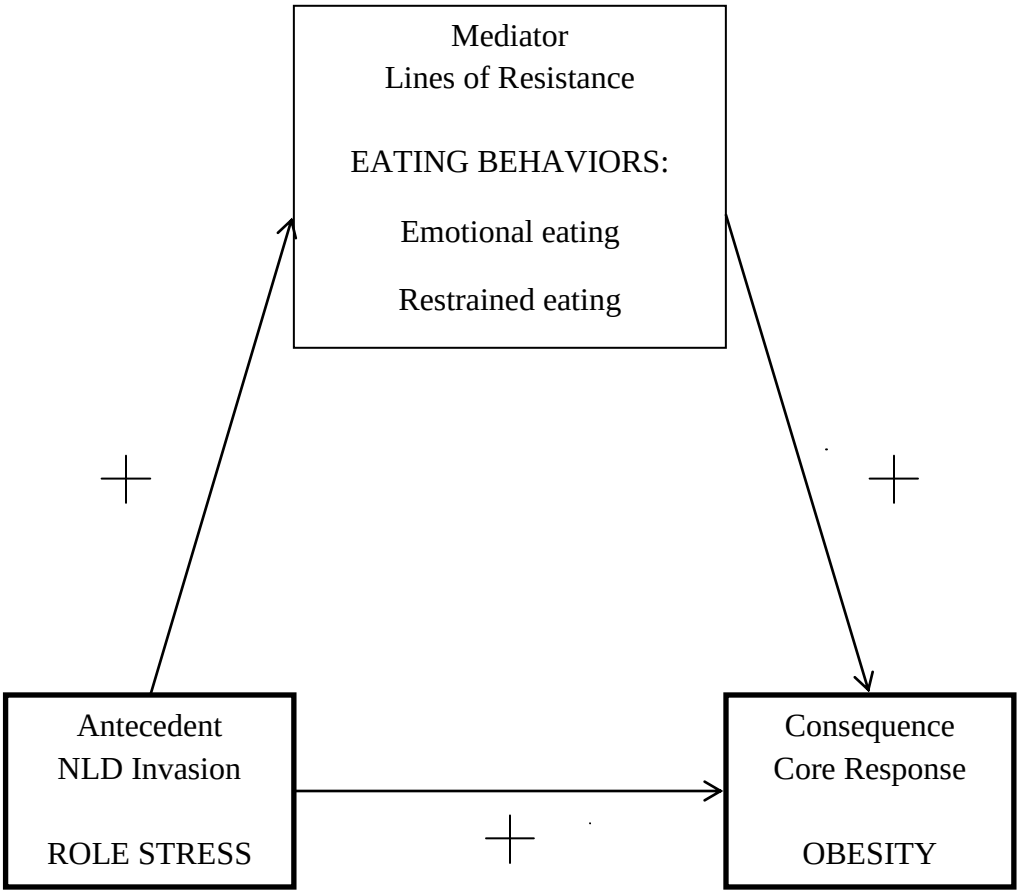
f. Backups occur hourly internally, and daily to a centralized backup system for offsite storage, and are encrypted.

g. Data is stored on a RAID 10 array, and O/S is stored on a RAID 1 array

13. QualysGuard network security audits are performed weekly, and McAfee SECURE scans are performed daily
14. SurveyMonkey maintains internal information security policies, including incident response plans, and regularly review and update them, and access controls to sensitive data in databases and systems are set on a need to know basis.
15. SurveyMonkey engineers use best practices and industry-standard secure coding guidelines to ensure secure coding
16. Software specifications: Code in ASP.NET 2.0, running on SQL Server 2008, Ubuntu Linux, and Windows 2008 Server. The most current patches are applied when needed to all operating systems and application files.

Appendix M

Mediated Model



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