

SELF-TALK, STYLES OF MOTIVATION, AND PERCEIVED COMPETENCE
TOWARD EXERCISING AND DIET

by

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ABSTRACT

The differences in the self-talk profiles of people with these different styles and levels of intrinsic traits, as well as those who report frequently exercising and eating healthily are explored. 119 students from Middle Tennessee State University participated. They completed a survey containing measures of the frequency and types of self-talk they might engage in when thinking about diet and exercise behaviors, the subscales “nutrition” and “physical activity” from a measure of health behavior frequency, measures of motivation within the domains of both exercise and diet, and measures of feelings of competence towards maintaining a diet and exercising regularly. Results provided moderate support for the predictions that health-related self-talk would be related to levels of perceived competence and autonomous motivational styles. Now, future research can continue to build on these findings and extend further into other areas of a healthy lifestyle.

TABLE OF CONTENTS

LIST OF TABLES.....	vi
LIST OF FIGURES.....	vii
CHAPTER I: INTRODUCTION.....	1
Self-Talk in Exercising and Dieting.....	2
Styles of Motivation toward Exercise and Diet.....	4
Perceived Competence in Exercise and Diet.....	7
Statement of the Problem and Hypotheses.....	8
Hypothesis 1: Frequency of Engagement.....	10
Hypothesis 2: Perceived Competence.....	10
Hypothesis 3: Health Behavior Engagement and Levels of Perceived Competence Interaction.....	11
Hypothesis 4: Health Behavior Engagement and Motivational Style Interaction.....	12
CHAPTER II: METHOD.....	14
Participants.....	14
Materials.....	14
Self-Talk Scale.....	14
Exercise STS.....	15
Diet STS.....	16
Treatment Self-Regulation Questionnaire (TSRQ).....	17
Perceived Competence Scale (PCS).....	18
Health-Promoting Lifestyle Profile II (HPLP-II).....	19

Procedure.	19
CHAPTER III: RESULTS.	20
Descriptive Statistics.	20
Tests of Hypotheses.	23
Hypothesis 1.	23
Hypothesis 2.	25
Hypothesis 3.	26
Hypothesis 4.	30
CHAPTER IV: DISCUSSION.	35
Limitations and Implications for Future Research.	38
REFERENCES.	41
APPENDICES.	45
Appendix A: IRB Approval.	46
Appendix B: Informed Consent.	47
Appendix C: STS Exercise.	48
Appendix D: STS Diet.	50
Appendix E: Demographics.	52

LIST OF TABLES

1. Descriptive Statistics for Perceived Competence in Diet and Exercise Domains	20
2. Descriptive Statistics for Self-Talk in Diet and Exercise Domains	21
3. Descriptive Statistics for Health Behavior Frequency in Diet and Exercise Domains.	21
4. Descriptive Statistics for Motivational Style in Diet and Exercise Domains	22
5. Correlations between Types of Self-Talk and Exercise Frequency	24
6. Correlations between Types of Self-Talk and Healthy Eating Frequency	24
7. Correlations between Self-Talk and Perceived Competence in Exercise	25
8. Correlations between Self-Talk and Perceived Competence in Diet	26
9. Perceived Competence, Self-Talk, and Exercising	27
10. Perceived Competence, Self-Talk, and Dieting	29
11. Motivation and Self-Talk in Exercise	32
12. Motivation and Self-Talk in Diet.	33

LIST OF FIGURES

1. Self-Critical Self-Talk, Perceived Competence, and Exercise Frequency 28
2. Self-Reinforcing Self-Talk, Level of Autonomy, and Diet Frequency 34

CHAPTER I: INTRODUCTION

Exercise and diet have been historically viewed as two vital factors in creating and/or maintaining a healthy lifestyle. Possessing an autonomous style of intrinsic motivation toward exercising and dieting, or engaging in a behavior because it aligns with intrinsic goals, has been shown to predict successful self-regulation in regard to exercise, eating, weight loss, and weight loss management (Mata et al., 2009). The APA Dictionary of Psychology (2007) defines self-regulation as “structuring the personal environment to facilitate desired behavior and circumvent situations that tend to elicit undesired behavior” (p. 832). Furthermore, research has shown that pairing an autonomous style of motivation with perceived competence effectively enhances intrinsic motivation (Ryan & Deci, 2000). The inner dialogue, or “self-talk,” of those with autonomous styles of motivation and perceived competence towards exercise and diet has been unexplored in the literature. In order to structure one’s personal environment to facilitate desired behavior, one is likely to utilize self-talk. Thus, the way in which one talks to oneself could potentially be correlated with styles of autonomy in one’s motivation as well as the presence of perceived competence in regard to diet and exercise behaviors.

The term *self-talk* refers to both external and internal dialogue that someone may engage in to serve certain self-regulatory functions (Brinthaupt, Hein, & Kramer, 2009). For example, an individual’s self-talk can serve to reinforce oneself, criticize oneself, manage oneself, and/or assess one’s social experiences. In a review of the sport and exercise self-talk literature, Hardy (2006) found that many researchers’ definitions of self-talk acknowledged the role that self-talk plays in self-regulation. For example, Hardy reports that researchers have defined self-talk as private speech that is addressed to the self for the purpose of self-regulation. He also elaborates on other definitions used by other researchers that include self-regulation in their definitions of

self-talk, including one that defines self-talk as dialogue that is used to interpret perceptions and feelings, regulates and changes evaluations and convictions, and gives one instructions and reinforcement (Brinthaupt et al., 2009).

Research exploring types of self-talk used by those who report frequently engaging in exercise and diet behaviors is lacking. Furthermore, there is no research exploring the self-talk profile of those who report having certain styles of motivation toward engaging in exercising and dieting as well as certain levels of perceived competence toward maintaining a diet or exercising regularly. This study aims to explore what types of self-talk are used by individuals who report frequently engaging in exercise and diet behaviors, have a controlled (engaging in a behavior in order to satisfy an external demand) or autonomous style of motivation toward exercising and dieting, and have a high or a low sense of competence in being able to exercise regularly and maintain a healthy diet.

In the following review of the literature, the research on types of self-talk used in populations who report engaging in dieting and/or exercise frequently are examined first. Next, I examine research looking at the self-talk of those who report controlled or autonomous levels of motivation toward exercise and diet. Finally, I discuss research surrounding the types of self-talk found in those who report high or low levels of perceived competence in regard to exercising regularly and maintaining a healthy diet.

Self-Talk in Exercising and Dieting

The subjective experience of talking to oneself has been explored extensively throughout the psychological research literature. Most existing research focuses its attention on the use of self-talk in athletes or other particular sport domains and how the content of athletes' inner speech affects their performance (Brinthaupt et al., 2009). However, self-talk is studied in other

domains outside of sports and health related activities. For example, self-talk is utilized in clinical psychology settings, particularly in cognitive behavioral therapy (CBT) (Hamilton, Kendall, Gosch, Furr, & Sood, 2008; Kendall & Treadwell, 2007). In CBT, self-talk is addressed through the cognitive restructuring component of the therapeutic process. In cognitive restructuring, patients' self-talk might be identified and altered with the goal of helping them to realize that their self-talk is overly negative and distorted and to ultimately decrease the negativity of their cognitions. Self-talk is also utilized in everyday life to serve a multitude of self-regulating purposes (Brinthaupt et al., 2009). As mentioned previously, self-talk can be used by anyone to reinforce oneself, criticize oneself, manage oneself, and/or assess one's social experiences.

Research examining the frequency of positive or negative self-talk in athletes has found that most of athletes' self-talk is positive (Hardy, Hall, & Hardy, 2004). A few studies have examined the frequency of certain types of self-talk in non-athletes who simply report exercising regularly. For example, Gammage, Hardy, and Hall (2001) found that positive self-talk was utilized significantly more often than negative self-talk. However, the types of self-talk that the non-athlete participants in their study reported were utilized only while engaging in exercise. There is very little research that focuses on the types of self-talk used outside of the exercise location by non-athletes who report exercising frequently. The types of self-talk used by non-athletes who report exercising frequently when they are not actually engaging in exercise behavior may be different than the self-talk used when they are engaging in exercise behavior. When engaged in the act of exercising, one's self-talk may be influenced by the occurrence of that physical activity, whereas when not exercising, one's self-talk is not being influenced by the physical strain that comes along with exercising.

In summary, the majority of research looking at self-talk within the domains of exercise and diet tend to focus on how the content of athletes' self-talk influences their performance. Furthermore, research has found the content of athletes' self-talk to be frequently positive. However, there is very little research that focuses on the types of self-talk used outside of the exercise location by non-athletes who report exercising frequently.

Styles of Motivation toward Exercise and Diet

Self-determination theory (SDT) is a theory of motivation that has been studied extensively in the research literature (Ryan & Deci, 2000). SDT posits that the overall quality and style of one's motivation can greatly affect one's willingness to engage in and maintain certain behaviors (Hagger et al., 2014). Within SDT, two styles of motivation are proposed: autonomous and controlled. Both styles represent one's underlying reasoning for engaging in or not engaging in certain behaviors. Hagger et al. define *autonomous* motivation as "engaging in a behavior because it is perceived to be consistent with intrinsic goals or outcomes and emanates from the self" (p. 566). People who have an autonomous style of motivation towards exercising or dieting engage in these behaviors because they feel the need to satisfy an intrinsic goal or urge. Those with intrinsic, autonomous motivation are not controlled by and do not feel compelled to fulfill the desires of factors outside of themselves that demand that the task be fulfilled. For example, someone who runs a mile each day in order to fulfill one's personal goal to do so is autonomously motivated. Hagger et al. define *controlled* motivation as "engaging in behaviors for externally referenced reasons such as to gain rewards or perceived approval from others or to avoid punishment or feelings of guilt" (p. 566). Those who feel as though they are performing a task or behavior because they are fulfilling the demands of an extrinsic factor possess controlled motivation. For example, someone running a mile each day just so that they

can satisfy the demands of a personal trainer would possess controlled motivation for engaging in such behavior.

The importance of possessing autonomous motivation for goal progress and attainment has been shown extensively throughout the research literature. Three studies and a meta-analysis completed by Koestner, Otis, Powers, Pelletier, and Gagnon (2008) showed that possessing an autonomous style of motivation is significantly related to goal progress, and that possessing a controlled style is not. Sheldon and Elliot (1998) showed that possessing an autonomous style of motivation for personal goals positively predicted attainment, whereas possessing a controlled style does not. Research examining the relation between style of motivation and goal progress/attainment is consistent in that an autonomous style of motivation has been shown to be positively correlated with goal progress as well as goal attainment.

Specific goals related to diet and exercise and the style of motivation behind the progress of these goals have also been examined by researchers. Hagger et al. (2014) examined the effects of autonomous and controlled forms of motivation across a number of health-related behaviors and found that an autonomous style of motivation had the strongest positive effect on behavior and intentions across almost all of the health-related behaviors examined, including exercising and dieting. Similarly, Standage, Sebire, and Loney (2008) found that autonomous motivation for exercise positively predicted bouts of exercise behavior of moderate-intensity during a 7-day period. An overall review of the research examining motivation in exercise behavior by Wilson, Mack, and Grattan (2008) concluded that more self-determined, or autonomous, styles of motivation are predictive of actual and intended exercise behavior frequency.

The content of self-talk in those who possess an autonomous or a controlled style of motivation toward engaging in exercise and maintaining a healthy diet is unexplored in the research. However, forms of self-talk and the effects of various forms of self-talk on goal-directed behavior have been examined in a study conducted by Senay, Albarracin, and Noguchi (2010). In their study, the authors found that speaking in an interrogative manner (“Will I”) as opposed to a declarative manner (“I Will”) was an important motivator for goal-directed behavior. Essentially, the results of Senay et al.’s study support the use of an interrogative form of self-talk for increasing autonomous motivation. To the author’s knowledge, this is the only study to explore how those who are autonomously motivated may talk to themselves. Regardless of whether they possess an autonomous style of motivation or a controlled style, people may talk to themselves just as frequently as one with the opposite style. However, *how* people talk to themselves may differ between the two styles of motivation.

Goals related to diet behaviors and the styles of motivation behind the progress of these goals have also been explored by researchers, but not nearly as extensively as exercise behaviors. For example, Pelletier, Dion, Slovinec-D'Angelo, and Reid (2004) examined the relationship between forms of regulation and eating behaviors related to dieting. Their results showed that being autonomously regulated was positively related to healthy eating behaviors whereas having controlled regulation was positively related to dysfunctional eating behaviors and negatively related to healthy eating behaviors. To the author’s knowledge, this is the only study to investigate, from an SDT perspective, the association of eating self-regulation and healthy eating behavior. However, research has also shown support for the generalization of research findings examining exercise motivation to the regulation of eating behavior (Mata et al., 2009).

In summary, research has shown that possessing an autonomous style of motivation is positively associated with both goal progress and attainment. Within the domains of exercise and diet, research has also shown that having an autonomous style of motivation has the strongest positive effect on behavior and intentions. Research has shown that possessing an autonomous style of motivation towards exercise can positively predict bouts of exercise behavior, and research also supports the generalization of research findings examining exercise motivation to the regulation of eating. In regard to diet behaviors, possessing an autonomous style of motivation towards healthy eating is positively related to healthy eating behaviors, whereas having a controlled style of motivation is positively related to dysfunctional eating behaviors and negatively related to healthy eating behaviors.

Perceived Competence in Exercise and Diet

Perceived competence can best be described as people's feelings toward whether or not they feel capable of being able to perform a certain task or behavior (VandenBos, 2007). For example, people with a high level of perceived competence toward exercise or maintaining a healthy diet feel as though they are self-efficacious in their own ability to do so, whereas those with a low level of perceived competence toward exercising or maintaining a healthy diet do not feel confident in their own ability to do so. The official SDT website states that perceived competence has been explored in several different studies, and has been used with perceived autonomy to predict effective performance, maintained behavior change, and the internalization of ambient values ("*Perceived Competence Scales*").

Perceived competence is often explored in research on how a sense of autonomy can predict behavior change. Ryan and Deci (2000) state that feelings of competence do not enhance intrinsic motivation without a person also possessing a sense of autonomy. In other words,

feeling competent about being able to perform a certain task does not automatically increase one's intrinsic motivation unless it is also paired with an autonomous style of motivation. Perceived competence has also been explored in regard to exercise behaviors by Wilson, Rodgers, Blanchard, and Gessell (2003), who found that the presence of both autonomy and competence were positively related to more self-determined exercise regulations compared to the absence of autonomy and competence, which were also more positively correlated with exercise behavior, attitudes, and physical fitness. It appears that no study has explored perceived competence in regard to diet behaviors.

In summary, to the author's knowledge, there are no studies that examine the self-talk of those who report a high or low level of perceived competence toward diet and exercise behaviors. This study will address this gap in the literature and explore the inner dialogue used by those who report feelings of perceived competence toward exercise and diet.

Statement of the Problem and Hypotheses

There is an absence of research examining the types of self-talk used in those who report either an autonomous or controlled style of motivation towards diet and exercise behaviors. To my knowledge, there are no studies that explore the self-talk of those who report being autonomous or controlled in their motivation towards dieting, exercising, or both. There is research that has looked at types of self-talk that could potentially increase autonomous motivation towards goals (Senay et al., 2010), as well as research that examined motivational self-talk in athletes (Hardy, 2006), but there are no studies that have examined the types of self-talk used in those who report already possessing an autonomous or controlled style of motivation towards diet, exercise, or both.

Prior to the development of the current study, I conducted a pilot study to examine the types of self-talk reported by those who also reported frequently engaging in healthy behaviors. I hypothesized that participants who scored higher overall on a measure of healthy behavior frequency would report engaging in self-reinforcing and self-managing self-talk more often than self-critical and social-assessing self-talk. The rationale for this hypothesis was that a frequent engagement in healthy behaviors may produce feelings of being proud of oneself for taking the time and effort to engage in such behaviors (self-reinforcing). Also, giving oneself instructions or directions about what one should do in order to maintain an engagement in healthy behaviors (self-management) may be present in the self-talk of individuals who report a higher frequency in the engagement of such behaviors. Participants were undergraduate students at MTSU, and the self-report measures included both the frequency and types of self-talk that one might engage in, as well as the frequency of engagement in health-related behavior. Although the results yielded a significant relationship that supported the hypotheses, the size of the relationship was weak.

The present study aimed to further evaluate the relationship by modifying the self-talk measure to better represent self-talk that specifically applies to thinking about exercise and diet behaviors and only to include the subscales that focus on the healthy behaviors of diet and exercise. It also explored an untouched area of research by examining the types of self-talk utilized by those who report possessing an autonomous style of motivation towards diet and exercise, as well as those who report a high level of perceived competence toward maintaining a healthy diet and exercising regularly. The following hypotheses were proposed.

Hypothesis 1: Frequency of Engagement. Frequency of engagement in healthy behaviors would be positively associated with self-reinforcing and self-managing self-talk and negatively associated with social-assessing and self-critical self-talk.

The rationale for this prediction was that a frequent engagement in exercise and diet behaviors may produce feelings of being proud of themselves for taking the time and effort to engage in such behaviors. Giving instructions or directions about what they should do in order to maintain an engagement in healthy behaviors may also be present in the self-talk of individuals who report a higher rather than a lower frequency in the engagement of such behaviors. People may produce feelings of being critical of themselves for not taking the time and effort to engage in healthy behaviors. They also may be internally assessing what others may be thinking about them if they are not engaging in such behaviors.

Hypothesis 2: Perceived Competence. Feelings of competence in ability to engage in healthy behaviors would be positively associated with self-reinforcing and self-managing self-talk and negatively associated with social-assessing and self-critical self-talk.

The rationale for this prediction was that by having a higher level of competency in their ability to exercise regularly and maintain a healthy diet, people may produce feelings of being proud of themselves for possessing the skills and knowledge necessary to engage in healthy behaviors. Giving instructions or directions about what they should do in order to maintain an engagement in behaviors related to diet and exercise may also be present in the self-talk of people who feel competent in their ability to exercise regularly and maintain a diet. By having a low level of perceived competence toward exercising regularly and/or maintaining a diet, people may be self-critical of their ability to exercise regularly and/or maintain a diet. People may talk to themselves in a criticizing manner for lacking the skills and knowledge necessary to perform

healthy behaviors. People also may talk to themselves about what others may be thinking about their lack of competence when it comes to performing these behaviors.

Hypothesis 3: Health Behavior Engagement and Levels of Perceived Competence

Interaction. I expected that the effect of perceived competence on self-talk would depend on health behavior frequency. I expected these perceived competence X health behavior frequency interactions to manifest themselves in several ways. Specifically, I predicted that those who report either a high or low level of perceived competence also would report using more self-critical and social-assessing self-talk if they also report a low level of health behavior frequency. I expected that those who report a high level of perceived competence would report using more self-reinforcing and self-managing self-talk if they also report a high level of health behavior frequency than those who report a high level of perceived competence and a low level of health behavior frequency. Finally, I predicted that those who report a low level of perceived competence would report using more social-assessing and self-managing self-talk if they also reported a high level of health behavior frequency than those who report a low level of perceived competence and a low level of health behavior frequency.

People may be critical of themselves for not engaging in behaviors that they feel competent in their ability to perform. If they are not engaging in these health-related behaviors, they may also be worried about what others think of their failure to engage in behaviors that they are competent in. People may also be critical of themselves for lacking the skills and knowledge necessary to perform these behaviors, and for not taking the time to learn these skills through engagement in said behaviors. People may produce feelings of being proud of oneself for possessing the skills and knowledge necessary to perform these healthy behaviors as well as for taking the time and effort to engage in these behaviors, and may give themselves instructions or

directions about what they should do in order to maintain an engagement in these behaviors. People who do not feel competent in their ability to perform these healthy behaviors but still report frequently engaging in them may talk to themselves about what others may think about them engaging in behaviors that they do not entirely know how to do. They also may be giving themselves instructions or directions about what they need to do in order to maintain an engagement in behaviors that they do not feel competent in doing.

Hypothesis 4: Health Behavior Engagement and Motivational Style Interaction. The effect of motivational style on self-talk would depend on health behavior frequency. I expected these motivational styles X health behavior frequency interactions to manifest themselves in several ways. Specifically, I predicted that those with either a controlled or autonomous style of motivation would report engaging in more self-reinforcing and self-managing self-talk if they also reported a high level of health behavior frequency. I also predicted that those with an autonomous style of motivation will engage in more self-critical self-talk if they also reported a low level of health behavior frequency. Finally, I predicted that those with a more controlled style of motivation would report more self-critical and social-assessing self-talk if they also reported a low level of health behavior frequency compare to those with a more controlled style of motivation and a high level of health behavior frequency.

The rationale for these predictions is that by possessing an autonomous style of motivation, people may produce feelings of being proud of oneself for engaging in behaviors that are consistent with their intrinsic goals. Giving instructions or directions about what they should do in order to maintain an engagement in behaviors related to exercise and diet may also be present in the self-talk of individuals with intrinsic goals related to exercise and diet behavior. People may also become more critical of themselves for failing to meet an autonomously

motivated goal and thus be more critical when talking to themselves when not engaged in exercise and diet behaviors. Possessing an autonomously motivated goal means that one is intrinsically motivated to complete said goal. Thus, when people fail to meet an intrinsically motivated goal, they might be critical of themselves for failing to meet a goal that they set for themselves and this should be reflected in their health-behavior-related self-talk.

By possessing a controlled style of motivation and a low frequency in the engagement of exercise and diet behaviors, people may be critical of their own performance when their behaviors serve the purpose of satisfying an external factor and they are not meeting the extrinsic goal. Thinking about what others may be thinking about them may also be present in those who engage in behaviors related to exercise and diet in order to satisfy an external factor. If the motivation to engage in exercise behavior is attributable to the demands of another person or something outside of themselves, people may talk to themselves about what others might be thinking about their performance. If they are not engaging in these health-related behaviors, they may also be worried about what others think of their failure to meet an external goal. People may feel proud of themselves for satisfying an external factor when they report engaging in exercise and diet behaviors frequently. People with a controlled motivational style also may need to give themselves instructions or directions about what they should do in order to maintain an engagement in behaviors related to exercise and diet when they report frequently engaging in them.

CHAPTER II: METHOD

Participants

Undergraduates ($N = 119$) were recruited through Middle Tennessee State University's psychology research pool. The sample was found to be predominately female ($n = 82$) with the mean age being 19.9 ($SD = 3.89$). 45% of the sample reported being Caucasian ($n = 54$), while 32% reported being African American ($n = 38$), 13% reported being Asian/Pacific Islander ($n = 15$), 8% reported being Latino ($n = 9$), and 3% indicated they belonged to another racial background other than the aforementioned races ($n = 3$). No one in the sample endorsed previously being formally diagnosed with or receiving treatment for an eating disorder.

Materials

Self-Talk Scale (STS; Brinthaup et al., 2009) The STS is a 16-item measure of one's frequency of self-talk. In addition to measuring one's overall frequency of engaging in self-talk, it also measures what type(s) of self-talk one engages in more or less frequently than others. The STS subscales include self-reinforcing, self-critical, social-assessing, and self-managing self-talk. Participants assume that each item begins with the statement "I talk to myself when...", then rate each item using a 5-point frequency scale (1 = *Never*, 5 = *Very Often*). Sample items for self-reinforcing self-talk include "I am really happy for myself" and "I'm proud of something I've done." Sample items for self-managing self-talk include "I'm mentally exploring a possible course of action" and "I want to remind myself of what I need to do." Sample items for social assessing self-talk include "I want to analyze something that someone recently said to me" and "I want to replay something I've said to another person." Sample items for self-critical self-talk include "I'm really upset with myself" and "Something bad has happened to me."

Evidence of test-retest reliability has been established by Brinthaupt et al. (2009), who reported that over a 3-month period, the correlation between the STS total scores was significant, $r(99) = .66, p < .001$. Cross-validation also has been established for the STS by Brinthaupt et al. (2009) who state that the subscale and total scores for the STS correlate in meaningful ways with other measures such as a measure of the use of verbal or visual strategies when thinking or processing information, a measure of the frequency of positive self-statements, a measure of both positive and negative feelings about the self that pertain to one's perceived self-worth, and a lack of a strong correlation with a measure that assesses the presence of social desirability. Brinthaupt, Benson, Kang, and Moore (2015) also provide validity for the STS by finding that self-reported self-talk as measured by the STS corresponds with observed self-talk frequency.

The STS used in this study was adapted from Brinthaupt et al. (2009) and is a 16-item measure of one's frequency of health-related self-talk. In particular, it has been modified to represent self-talk that deals with thinking about exercise and diet behaviors. Two separate modified versions of the STS were used: one directed towards self-talk dealing with exercise and the other dealing with diet.

Exercise STS. The exercise STS is a modified version of the original STS with 16 items (see Appendix C). Participants rated each item using a 5-point frequency scale (1 = *Never*, 5 = *Very Often*). Participants assumed that each item began with the statement, "Over the past few days, I have talked to myself when..." As with the original STS, subscales for this measure include: self-reinforcing, self-critical, social-assessing, and self-managing self-talk. Sample items for self-reinforcing exercise self-talk include "I feel good about exercising" and "I'm proud of myself for exercising." Sample items for self-managing self-talk include "I need to figure out what I need to do to enable myself to exercise more" and "I'm mentally exploring a

possible course of action when attempting to exercise more often.” Sample items for social-assessing self-talk include “I’m imagining how other people respond to my exercise behavior” and “I try to anticipate what others will think about my exercise behaviors.” Sample items for self-critical self-talk include “I feel out of shape” and “I’m really upset with my exercise habits.” For the present sample, internal consistency values for the adapted STS exercise subscale measures were all in the acceptable range: self-criticism ($r = .654$), self-reinforcement ($r = .820$), self-managing ($r = .769$), and social-assessing ($r = .843$). The internal consistency value for the total exercise STS was also acceptable ($r = .868$).

Diet STS. The diet STS is a modified version of the original STS with 16 items pertaining to eating behavior (see Appendix D). Sample items for self-reinforcing diet self-talk include “I’m proud of myself for eating healthy” and “I consider how happy I am after a healthy meal.” Sample items for self-managing diet self-talk include “I want to remind myself of what I need to do in order to eat better” and “I’m mentally exploring a course of action when attempting to eat better.” Sample items for social-assessing self-talk include “I try to anticipate what others will think about my eating behaviors” and “I want to analyze comments related to my eating behavior that someone recently said to me.” Sample items for self-critical self-talk include “I feel bad for what I ate” and “I’m really upset with my eating habits.” The same 5-point Likert scale was used for the Diet STS as in the original STS. Internal consistency values for the adapted STS diet subscale measures were all in the acceptable range: self-criticism ($r = .664$), self-reinforcement ($r = .803$), self-managing ($r = .784$), and social-assessing ($r = .796$). The internal consistency value for the total diet STS was also acceptable ($r = .886$).

For both measures, higher scores on each subscale indicate higher frequency in the engagement of that kind of self-talk. Possible total scores range from 16 to 80, and the subscale scores can range from 4 to 20.

Treatment Self-Regulation Questionnaire (TSRQ). The TSRQ (Levesque et al., 2007) is a 15-item measure of domain-specific motivation. Two specific versions of the TSRQ were used: Exercise and Diet.

Participants rated each item using a 7-point Likert-type scale (1 = *Not at all true*, 7 = *Very true*). Participants indicated the extent to which each reason for engaging in the domain specific behavior was true for them. They assumed that each item began with the statement, “The reason I would exercise regularly is...” Subscales of this measure included: Amotivation (lack of motivation) (3 items), Autonomous regulatory style (engaging in behavior because it is perceived as aligning with intrinsic goals) (6 items), and Controlled regulatory style (engaging in a behavior in order to satisfy an external variable) (6 items). A sample item from the Exercise version included in the autonomous regulatory style subscale was, “Because it is an important choice I really want to make.” A sample item from the controlled regulatory subscale was: “Because I feel pressure from others to do so,” and a sample item from the amotivation subscale was: “I don’t really know why.” A sample item from the Diet version in the autonomous regulatory subscale was: “Because I would feel guilty or ashamed of myself if I did not eat a healthy diet.” A sample item from the controlled regulatory subscale was: “Because others would be upset with me if I did not,” and a sample item from the amotivation subscale was: “I really don’t think about it.” Internal consistency values for the TSRQ autonomous ($r = .909$) and controlled ($r = .796$) subscales were acceptable.

The highest scoring subscale represents the individual's motivational style toward diet/exercise. Total scores can range from 15—105, with the amotivation subscale scores ranging from 3 to 21, the autonomous regulatory subscale ranging from 6—42, and the controlled regulatory style subscale ranging from 6—42. A validation article of the TSRQ by Lavesque et al. (2007) supports psychometric properties of the TSRQ in both the exercise and diet domains.

Perceived Competence Scale (PCS). The PCS is a 4-item measure of feelings of competence toward a specific domain (Perceived Competence Scales, n.d.). Participants rate each item using a 7-point Likert-type scale (1 = *Not at all true*, 7 = *Very true*). Two specific versions of the PCS were used: “Exercising Regularly” (ER) and “Maintaining a Healthy Diet” (MHD). For the ER version, participants indicated the extent to which each statement was true for them, assuming they were intending either to begin now a permanent regimen of exercising regularly or to permanently maintain their regular exercise regimen. For the MHD version, participants indicated the extent to which each statement was true for them, assuming that they were intending either to permanently improve their diet now or maintain a healthy diet.

Sample items from the ER version included: “I feel confident in my ability to exercise regularly” and “I am able to exercise regularly over the long term.” Sample items from the MHD version included: “I feel confident in my ability to maintain a healthy diet” and “I am able to meet the challenge of maintaining a healthy diet.” Williams, Ryan, and Deci (“Health-Care, Self-Determination Theory Packet”, n.d.) state that the coefficient alpha for the items on this scale is about .90, thus indicating the PCS to be a reliable measure. Validity also has been established in a study conducted by Williams and Deci (1996). Total scores range from 4 to 28, with higher scores indicating greater levels of perceived competence. For the present sample,

internal consistency values for PC diet ($r = .927$) and PC exercise ($r = .921$) were both in the acceptable range. High/low groups were created using a mean split for both scales.

Health-Promoting Lifestyle Profile II (HPLP-II). The HPLP-II is a 52-item measure of frequency of health-promoting lifestyle habits (Walker, Sechrist, & Pender, 1987).

Participants rate each item using a 4-point Likert-type scale (1 = *Never*, 4 = *Routinely*).

Participants assume each item is a statement about their present way of life or personal habits.

Subscales in this measure include: Health Responsibility, Physical Activity, Nutrition, Spiritual Growth, Interpersonal Relations, and Stress Management. This study used the Physical Activity (8 items) and Nutrition (9 items) subscales. Sample items from the Physical Activity subscale included: “Follow a planned exercise program” and “Do stretching exercises at least 3 times per week.” Sample items from the Nutrition subscale included: “Choose a diet low in fat, saturated fat, and cholesterol” and “Limit use of sugars and food containing sugar.” Both reliability and validity for this measure and its subscales have been established by Walker et al. (1987).

High/low groups were created using a mean split for both subscales.

Procedure

Participants were administered the informed consent form, measures, and demographics questionnaire in a vacant classroom on MTSU’s campus within a 30-minute time slot with no more than 25 participants assigned to one time slot. The informed consent form was administered first, followed by the survey packet containing all aforementioned measures in addition to a demographics questionnaire. The demographics questionnaire collected information regarding participants’ age, sex, race, weight, and height. The order of the presentation of measures was counterbalanced with demographic items always appearing at the end. The total number of items in the survey packet was 92.

CHAPTER III: RESULTS

Descriptive Statistics

Means and standard deviations for all major measures (both total and subscales) are reported in Tables 1, 2, 3, and 4. The difference in means between total scores on the measures of perceived competence in the domains of exercise and diet was found to be statistically significant ($t(118) = -2.971, p = .004$). The sample reported feeling more competent in their ability to exercise regularly than they did in maintaining a healthy diet, as shown in Table 1.

Table 1

Descriptive Statistics for Perceived Competence in Diet and Exercise Domains

	<u>M</u>	<u>SD</u>
PC Diet total	4.82	1.33
PC Exercise total	5.18	1.37

Note. $N = 119$; Ratings made using a 7-point (1 = *not at all true*, 7 = *very true*) scale.

As Table 2 indicates, the sample also reported using self-reinforcing self-talk more frequently than the other types of self-talk in both exercise and diet domains, and social-assessing self-talk less frequently in both domains. The difference in means between total scores on the subscales physical activity and nutrition of the HPLP-II (see Table3) was found to be statistically significant ($t(118) = 3.635, p = .000$). The sample reported engaging in healthy eating more often than engaging in exercise behaviors.

Table 2

Descriptive Statistics for Self-Talk in Diet and Exercise Domains

	<u>M</u>	<u>SD</u>
Self-Critical (diet)	12.51	3.47
Self-Reinforcing (diet)	15.19	3.60
Self-Managing (diet)	14.14	3.58
Social-Assessing (diet)	9.62	3.75
STS Diet total	51.47	11.43
Self-Critical (exercise)	12.47	3.48
Self-Reinforcing (exercise)	15.45	3.73
Self-Managing (exercise)	13.73	3.60
Social-Assessing (exercise)	9.63	3.97
STS Exercise total	51.29	11.07

Note. $N = 119$; ratings made using a 5-point (1 = *Never*, 5 = *Very Often*) frequency scale.

Table 3

Descriptive Statistics for Health Behavior Frequency in Diet and Exercise Domains

	<u>M</u>	<u>SD</u>
HPLP total	40.68	8.97
HPLP (nutrition)	21.17	5.00
HPLP (physical activity)	19.51	5.25

Note. $N = 119$; ratings made using a 4-point (1 = *Never*, 4 = *Routinely*) Likert-type scale.

Descriptive statistics for the measure of motivational style (Table 4) showed that participants were much more likely to endorse an autonomous style of motivation as opposed to a controlled style in both the diet ($t(118) = 18.071, p = .000$) and exercise ($t(118) = 17.109, p = .000$) domains.

Table 4

Descriptive Statistics for Motivational Style in Diet and Exercise Domains

	<u>M</u>	<u>SD</u>
TSRQ Autonomous (diet)	34.33	7.04
TSRQ Controlled (diet)	19.18	7.66
TRSQ Autonomous (Exercise)	34.07	7.22
TRSQ Controlled (Exercise)	19.64	7.39
TSRQ total (diet)	15.15	9.15
TSRQ total (exercise)	14.43	9.20

Note. $N = 119$; ratings made using a 7-point (1 = *not at all true*, 7 = *very true*) scale.

Analysis of gender differences revealed that female participants reported significantly higher levels of all four STS diet subscale than male participants (all $ps < .02$). In addition, women ($M = 14.30, SD = 3.54$) reported higher levels of STS exercise self-managing self-talk than men ($M = 12.42, SD = 3.48$), $t(116) = 2.68, p = .008$. For the total scales, women reported significantly higher exercise self-talk ($M = 52.58, SD = 11.16$) than men ($M = 48.07, SD = 10.37$), $t(116) = 2.07, p = .04$. Women also reported significantly higher diet self-

talk ($M = 53.62$, $SD = 10.68$) than men ($M = 46.44$, $SD = 11.79$), $t(116) = 3.26$, $p < .001$. There were no other gender differences for the remaining measures.

In summary, the descriptive statistics showed that the sample reported feeling more competent in their ability to exercise regularly than they did in maintaining a healthy diet. They also showed that the sample engaged in healthy eating more often than exercise behaviors, and endorsed a more autonomous style of motivation as opposed to a controlled style in both diet and exercise.

Tests of Hypotheses

Hypothesis 1. A correlational analysis was used to test hypothesis 1. The frequency of engagement in healthy behaviors was expected to be positively associated with self-reinforcing and self-managing self-talk and negatively associated with social-assessing and self-critical self-talk. As Table 5 shows, correlational analyses yielded a significant negative relationship between engaging in self-critical exercise self-talk and engaging in exercise behaviors, and a significant positive relationship between engaging in self-reinforcing exercise self-talk and engaging in exercise behaviors. Also, a significant positive correlation was found between engaging in healthy eating behaviors and self-reinforcing diet self-talk, but there was no significant relationship between self-critical diet self-talk and engagement in dieting behaviors (see Table 6).

These results partially support hypothesis 1 given that the data show that those who frequently engage in exercise behaviors are more likely to talk to themselves about exercising in a reinforcing manner, and less likely to talk to themselves about exercising in a critical manner. The results also show that those who frequently engage in dieting behaviors are more likely to

talk themselves about dieting in a reinforcing manner. It should also be noted that neither self-managing nor social-assessing self-talk were significantly related to healthy eating or exercise frequency.

Table 5

Correlations between Types of Self-Talk and Exercise Frequency

	Self-Reinforcing Self-Talk (Exercise)	Self-Critical Self-Talk (Exercise)	Self-Management Self-Talk (Exercise)	Social Assessment Self-Talk (Exercise)	Total Exercise Self-Talk
Physical Activity (HPLP-II)	.264**	-.223*	-.037	.092	.039
HPLP-II total	.289**	-.235*	-.019	.135	.065

Note. $N = 119$; * $p < .05$; ** $p < .01$

Table 6

Correlations between Types of Self-Talk and Healthy Eating Frequency

	Self-Reinforcing Self-Talk (Diet)	Self-Critical Self-Talk (Diet)	Self-Management Self-Talk (Diet)	Social Assessment Self-Talk (Diet)	Total Diet Self-Talk
Nutrition (HPLP-II)	.238**	.034	.071	.139	.153
HPLP-II total	.167	-.019	.066	.101	.100

Note. $N = 119$; * $p < .05$; ** $p < .01$

Hypothesis 2. A correlational analysis was used to test hypothesis 2. Feelings of competence in ability to engage in healthy behaviors were expected to be positively associated with self-reinforcing and self-managing self-talk and negatively associated with social-assessing and self-critical self-talk. As Table 7 shows, correlational analyses yielded a significant positive relationship between self-reinforcing exercise self-talk and perceived competence in one's ability to exercise regularly, but no other significant results. None of the correlations between perceived competence and diet self-talk were significant (see Table 8). Thus, hypothesis 2 was only weakly supported, showing that people who feel more competent in their ability to exercise regularly are more likely to use self-reinforcing self-talk than other types of self-talk.

Table 7

Correlations between Self-Talk and Perceived Competence in Exercise

	Self-Reinforcing Self-Talk (Exercise)	Self-Critical Self-Talk (Exercise)	Self-Management Self-Talk (Exercise)	Social Assessment Self-Talk (Exercise)	Total Exercise Self-Talk
Perceived Competence (Exercise)	.296**	-.080	.015	.021	.087

Note. $N = 119$; * $p < .05$; ** $p < .01$

Table 8

Correlations between Self-Talk and Perceived Competence in Diet

	Self-Reinforcing Self-Talk (Diet)	Self-Critical Self-Talk (Diet)	Self-Management Self-Talk (Diet)	Social Assessment Self-Talk (Diet)	Total Diet Self-Talk
Perceived Competence (Diet)	.121	-.171	.059	.001	.005

Note. $N = 119$; * $p < .05$; ** $p < .01$

Hypothesis 3. A 2 X 2 between-subjects ANOVA, with a Bonferroni correction for the alpha level for the 4 STS subscale tests was conducted for hypothesis 3. I predicted that the effect of perceived competence on self-talk will depend on health behavior frequency.

It was found that the high perceived competence (exercise) group ($M = 16.41$, $SD = 3.66$) reported significantly higher self-reinforcing exercise self-talk compared to the low perceived competence (exercise) group ($M = 14.50$, $SD = 3.56$), $F(1, 115) = 4.10$, $p = .05$. In addition, those in the low exercise frequency group ($M = 13.10$, $SD = 3.40$) reported significantly higher self-critical exercise self-talk compared to the high exercise frequency group ($M = 11.8$, $SD = 3.50$), $F(1, 115) = 4.10$, $p = .05$. No other main effects were found.

A statistically significant perceived exercise competence X level of exercise interaction effect was found for engagement in self-critical exercise self-talk (see Table 9), $F(1, 115) = 3.86$, $p = .05$). As shown in Figure 1, the highest level of self-critical exercise self-talk occurred among those with high perceived competence but low exercise frequency. No other interaction effects were found in the exercise domain. No interaction effects were found in the domain of diet (see Table 10). Thus, hypothesis 3 was weakly supported by showing that those who feel competent

in their ability to exercise regularly talk to themselves in a more criticizing manner particularly when they also report not exercising frequently.

Table 9

Perceived Competence, Self-Talk, and Exercising

HPLP-II (Physical Activity)	Perceived Competence (Exercise)							
	High				Low			
	High (n = 43)		Low (n = 18)		High (n = 13)		Low (n = 45)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Self- Reinforcing Self-Talk (Exercise)	16.60	3.89	15.94	3.10	15.23	3.03	14.22	3.69
Self- Critical Self-Talk (Exercise)	11.53	3.44	14.39	2.33	12.54	3.64	12.58	3.63
Social Assessing Self-Talk (Exercise)	9.89	4.18	9.25	4.10	10.85	4.08	9.18	3.71
Self- Managing Self-Talk (Exercise)	13.63	3.77	14.89	3.48	13.54	3.05	13.42	3.70
Total Exercise Self-Talk	51.66	11.68	54.47	8.97	52.15	10.96	49.41	11.25

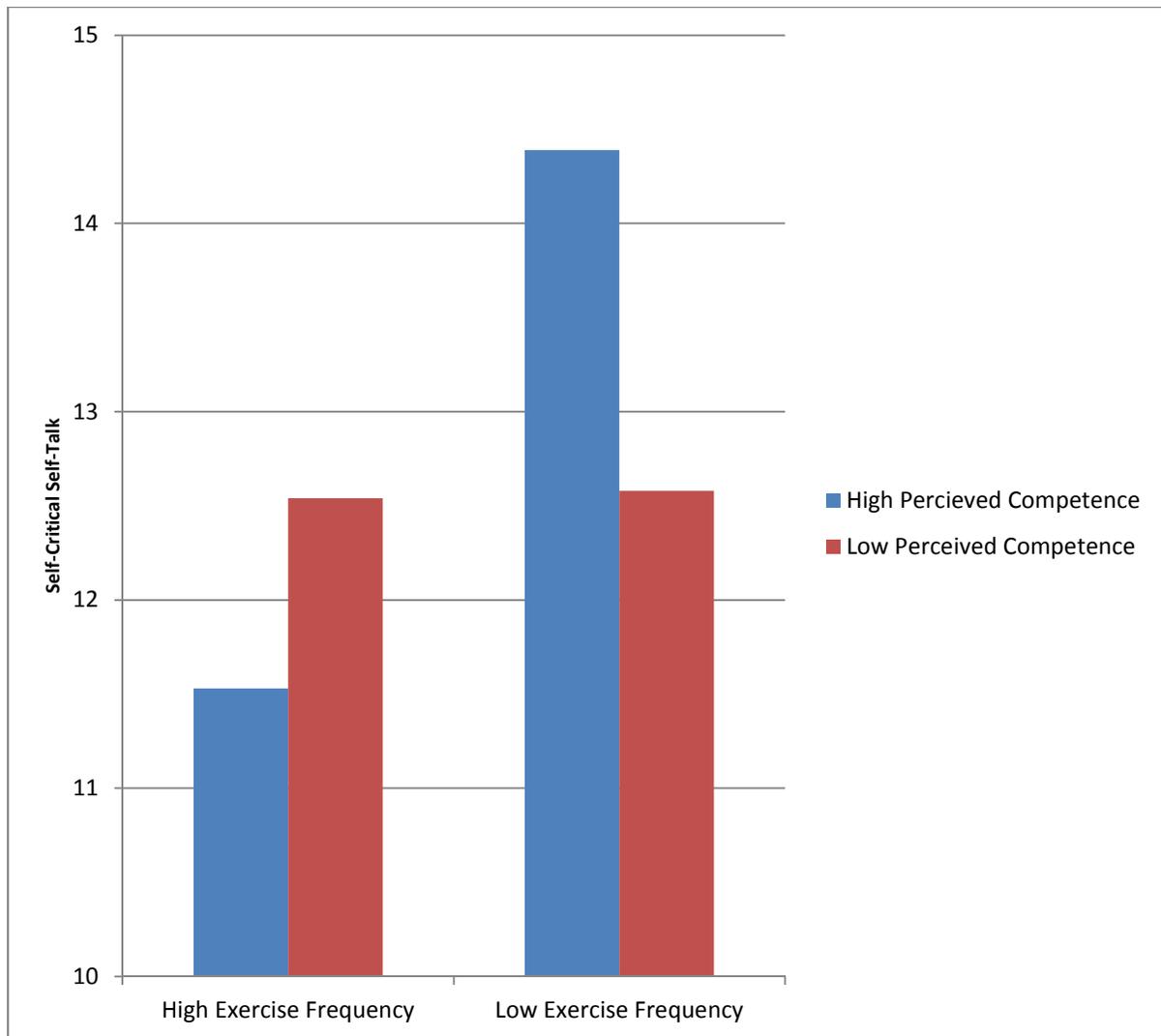


Figure 1

Self-Critical Self-Talk, Perceived Competence, and Exercise Frequency

Table 10

Perceived Competence, Self-Talk, and Dieting

HPLP-II (Nutrition)	Perceived Competence (Diet)							
	High				Low			
	High (n = 37)		Low (n = 24)		High (n = 25)		Low (n = 33)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Self- Reinforcing Self-Talk (Diet)	15.70	3.94	14.58	4.39	15.28	2.97	15.00	3.03
Self- Critical Self-Talk (Diet)	11.89	3.62	12.17	3.45	13.80	3.50	12.48	3.18
Social Assessing Self-Talk (Diet)	9.65	3.72	9.75	4.42	10.12	3.92	9.12	3.19
Self- Managing Self-Talk (Diet)	14.00	3.94	15.00	3.75	14.36	3.17	13.52	3.31
Total Diet Self-Talk	51.24	12.44	53.56	10.18	51.50	12.33	50.12	10.72

Hypothesis 4. A 2 X 2 between-subjects ANOVA, with a Bonferroni correction for the alpha level for the 4 STS subscale tests was conducted for hypothesis 4. I also hypothesized that the effect of motivational style on self-talk would depend on health behavior frequency.

Due to the disproportionate number of participants who reported possessing an autonomous style of motivation for both exercising regularly and maintaining a diet as opposed to possessing a controlled style, either a median or mean split was used to separate those who reported being more and less autonomous. This was done so that the data could be as close to an even split of the sample as possible.

In regard to main effects within the realm of eating healthily, it was found that those in the high healthy eating frequency group ($M = 52.18$, $SD = 11.55$) talked to themselves significantly more about eating healthily compared to the low healthy eating frequency group ($M = 50.70$, $SD = 11.34$), $F(1, 115) = 11.66$, $p = .001$. It was also found that those in the high autonomy diet group ($M = 16.34$, $SD = 3.20$) reported significantly higher self-reinforcing diet self-talk compared to the low autonomy diet group ($M = 13.81$, $SD = 3.60$), $F(1, 115) = 15.66$, $p = .00$. In addition, it was found that those in the high autonomy diet group ($M = 15.26$, $SD = 3.24$) reported significantly higher self-managing self-talk compared to the low autonomy diet group ($M = 12.80$, $SD = 3.52$), $F(1, 115) = 15.83$, $p = .00$. No other main effects were found within the realm of healthy eating.

In regard to main effects within the realm of exercise, it was found that those in the low exercise frequency group ($M = 13.10$, $SD = 3.40$) reported significantly higher self-critical self-talk compared to the high exercise frequency group ($M = 11.77$, $SD = 3.50$), $F(1, 115) = 5.10$, $p = .03$. It was also found that those in the high exercise autonomy group ($M = 16.61$, $SD = 3.73$) reported significantly higher self-reinforcing self-talk compared to the low exercise autonomy

group ($M = 14.49$, $SD = 3.47$), $F(1, 115) = 7.00$, $p = .01$. No other main effects were found within the realm of exercise.

No interaction effects were found in the domain of exercise (see Table 11). A statistically significant motivation (high/low autonomous) X healthy eating frequency (high/low) interaction effect was found for self-reinforcing diet self-talk (see Table 12) $F(1, 115) = 5.731$, $p = .02$. As shown in Figure 2, participants who reported higher levels of autonomous motivation and higher healthy eating frequency reported the highest levels of self-reinforcing diet-related self-talk. No other interaction effects were found in the diet domain. Thus, there was minimal support for hypothesis 4—those who possess a high level of autonomous motivation in eating healthy talk to themselves in a more reinforcing manner about eating healthy particularly if they also report frequently eating healthily.

Table 11

Motivation and Self-Talk in Exercise

HPLP-II (Physical Activity)	Level of Autonomous Motivation in Exercising Regularly							
	High				Low			
	High (n = 34)		Low (n = 20)		High (n = 22)		Low (n = 43)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self- Reinforcing Self-Talk (Exercise)	16.82	4.13	16.25	2.99	15.45	2.91	14.00	3.66
Self- Critical Self-Talk (Exercise)	11.38	3.69	14.05	3.09	12.36	3.13	12.65	3.47
Social Assessing Self-Talk (Exercise)	10.31	4.70	9.50	3.75	9.82	3.17	9.06	3.85
Self- Managing Self-Talk (Exercise)	13.50	4.06	15.15	3.28	13.77	2.65	13.23	3.72
Total Exercise Self-Talk	52.01	12.89	54.95	9.06	51.41	8.92	48.95	11.14

Table 12

Motivation and Self-Talk in Diet

HPLP-II (Nutrition)	Level of Autonomous Motivation in Maintaining a Diet							
	High				Low			
	High (n = 38)		Low (n = 27)		High (n = 24)		Low (n = 30)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Self-Reinforcing Self-Talk (Diet)	17.05	2.427	15.33	3.873	13.13	3.768	14.37	3.409
Self-Critical Self-Talk (Diet)	13.16	3.453	12.96	2.780	11.88	3.927	11.80	3.614
Social Assessing Self-Talk (Diet)	10.21	3.648	9.70	4.159	9.25	3.981	9.10	3.346
Self- Managing Self-Talk (Diet)	15.16	3.325	15.41	3.178	12.54	3.575	13.00	3.523
Total Diet Self-Talk	55.58	9.841	53.41	10.036	46.79	12.201	48.27	12.040

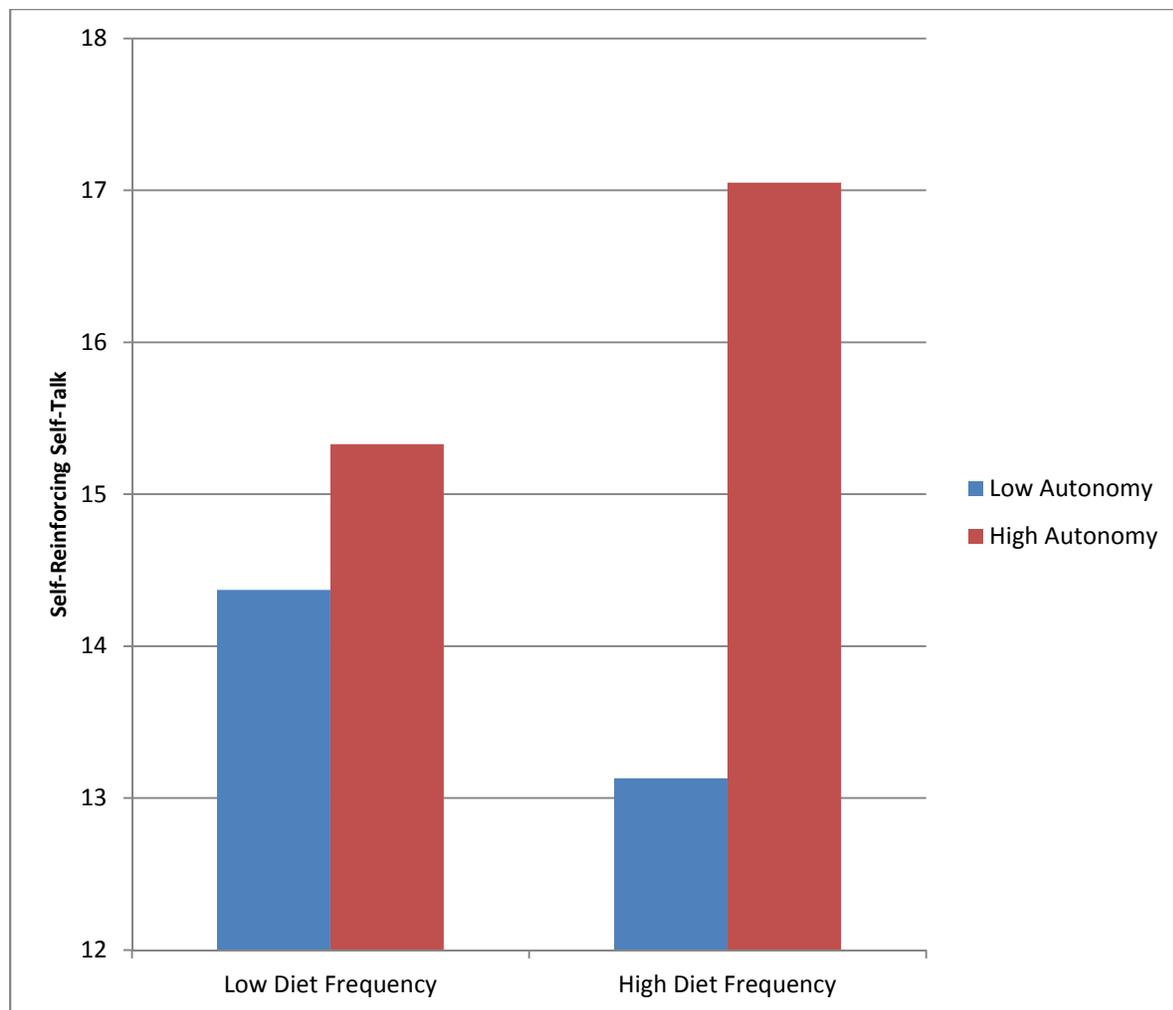


Figure 2

Self-Reinforcing Self-Talk, Level of Autonomy, and Diet Frequency

CHAPTER IV: DISCUSSION

The purpose of this study was to explore the types of self-talk that are used by individuals who report frequently or infrequently engaging in exercise and diet behaviors, have a controlled or autonomous style of motivation toward exercising and dieting, and have a high or a low sense of competence in being able to exercise regularly and maintain a healthy diet. The uses of certain types of self-talk were expected to correlate with certain levels of perceived competence, as well as with health behavior frequency. Interactions were expected to be found between certain levels of perceived competence, health behavior frequency, and certain types of self-talk. Interactions were also expected to be found between certain styles of motivation, health behavior frequency, and certain types of self-talk.

Results showed that those who exercise frequently tend to talk to themselves about exercising in a more reinforcing manner. In addition, I found that those who exercise infrequently tend to talk to themselves about exercising in a more critical manner. I also found that those who frequently engage in healthy eating behaviors tend to talk to themselves about eating healthily in a more reinforcing manner. Thus, hypothesis 1 was found to be partially supported.

It is possible that frequently exercising or eating healthily may produce feelings of being proud of oneself for taking the time and effort to engage in such behaviors. However, infrequently exercising may produce critical feelings toward oneself for not taking the time and effort to exercise. The majority of research looking at self-talk within the domains of exercise and diet tend to focus on how the content of athletes' self-talk influences their performance. Furthermore, research has found the content of athletes' self-talk to be frequently positive (Hardy et al., 2004). While it was not necessary for those who participated in this particular study to be

athletes, the results for hypothesis 1 support previous research that has found frequent positive/reinforcing self-talk in those who exercise frequently (i.e., athletes). In addition, these results support previous research that has found non-athletes who report exercising frequently to engage in more positive, as opposed to negative, self-talk (Gammage et al., 2001). Thus, these results support previous research exploring the inner dialogue of those who report exercising frequently. However, results regarding the use of more self-reinforcing diet self-talk in those who report frequently eating healthily contributes to a previously unexplored area of research.

Those who reported feeling competent in their ability to exercise regularly tended to also report talking to themselves about exercising in a more reinforcing manner. Thus, hypothesis 2 was found to be partially supported. Results of this study also showed that those who feel competent in their ability to exercise regularly talk to themselves in a more criticizing manner if they also report not exercising frequently, thus providing some support for hypothesis 3. Finally, I found that those who possess a high level of autonomous motivation in eating healthily talk to themselves in a more reinforcing manner if they also report frequently eating healthily, thus providing some support for hypothesis 4.

A possible explanation for the partial support found in hypothesis 2 is that by having a higher level of competency in one's ability to exercise regularly, a person may produce feelings of being proud of oneself for possessing the skills and knowledge necessary to exercise regularly. To the author's knowledge, there are no studies that examine the self-talk of those who report a high or low level of perceived competence toward diet and exercise behaviors. Thus, these results contribute to a previously unexplored area of research.

A possible explanation for the support found in hypothesis 3 is that people may be critical of themselves for not engaging in behaviors that they feel competent in their ability to perform.

Those who lack the self-perceived competence to engage in behaviors such as exercising may not be as critical towards themselves for choosing not to engage in these behaviors because they feel as though they lack the knowledge and skills necessary to do so. Those who believe they possess the knowledge and skills necessary to exercise regularly may talk to themselves in a critical manner for not putting their knowledge and skills to use. The relationship between perceived competence and health behavior frequency appears to have been previously unexplored in research; therefore, these results also contribute to an unexplored area of research.

A possible explanation for the support found in hypothesis 4 is that by possessing a high level of autonomous motivation, people may produce feelings of being proud of themselves for engaging in behaviors that are consistent with their intrinsic goals. Those who are self-motivated to eat healthily may talk to themselves in a more reinforcing manner about taking the necessary steps required to do something that satisfies their internal desire to eat healthily. The possible interactions between types of self-talk, styles of motivation, and health behavior frequency had not been explored in research. The results found for this hypothesis further add to previously unexplored areas of research.

Self-managing and social-assessing self-talk were found to be very minimally related to the intrinsic beliefs and motivations examined within this study. Reasons as to why social-assessing self-talk appeared to be mostly unrelated to exercise and diet may have to do with the primarily autonomously motivated sample used. If more participants reported engaging in healthy behavior in order to satisfy the needs or desires of another person, I might have been better able to determine if people also report talking to themselves about what others are thinking about their behavior. Reasons as to why self-managing self-talk appeared to be mostly unrelated to exercise and diet may be explained by the possibility that it may not be necessary to talk to

oneself about what needs to be done in order to go exercise or eat healthily. If healthy food or an exercise location is readily available to someone, they may not need to talk to themselves about what steps have to be taken in order to eat healthily or exercise.

Limitations and Implications for Future Research

There were several limitations to this study. First, generalizability of findings is limited due to the predominately female sample taken from a pool of undergraduate students at Middle Tennessee State University. Second, the disproportionate number of participants who endorsed an autonomous style of motivation as opposed to a controlled style hindered the ability to examine the self-talk utilized by those who report possessing a controlled style of motivation. As mentioned previously, social-assessing self-talk would be expected to be more prominent in those who report a controlled style of motivation. Third, the sample size could have been larger in order to further increase generalizability and the power of results. And finally, the self-report nature of the study is also a limitation. While someone may subjectively report that they do in fact exercise regularly or eat healthily, objectively, this may not be the case.

Future research should address the current limitations of this study by including more participants who are likely to endorse a controlled style of motivation so that a true comparison can be conducted between those who report different styles of motivation. Future research should also utilize a larger, more diverse sample in order to increase generalizability. Specifically, an older, non-college student sample may yield different results. The availability of an exercise location on the campus from which this sample was taken may affect the participants' motivation to exercise, and potentially their beliefs about their own ability to participate in physical activity. It would also be beneficial for future research to explore the same concepts explored in the current study in different domains of healthy behavior. Some of

the health domains that could be explored include stress management, interpersonal relations, and alcohol and drug use.

In conclusion, this study examined several intrinsic traits related to self-regulatory processes within the health domains of diet and exercise. Self-regulation, as defined by the APA dictionary of psychology, is “structuring the personal environment to facilitate desired behavior and circumvent situations that tend to elicit undesired behavior” (p. 832). In order to structure one’s personal environment to facilitate desired behavior such as eating healthily or exercising frequently, one is likely to utilize self-talk. Possessing an autonomous style of motivation has been shown through research to be positively associated with both goal progress and attainment (Koestner et al., 2008). Previous research has also shown that the presence of both autonomy and competence are positively related to more self-determined healthy behavior regulations (Wilson et al., 2003). This study has filled some of the gaps present in the self-regulatory literature related to performing exercise and diet behaviors by exploring possible relationships between the aforementioned intrinsic traits and different types of self-talk.

The results showed at least minimal support for each hypothesis, and have created a basis for researchers to further explore this previously untouched area of research. By understanding the ways in which people talk to themselves regarding certain health-related behaviors, clinicians or health coaches could potentially work with clients to increase their use of certain types of self-talk that have been shown to correlate with performing health related behaviors. By doing so, clinicians or coaches could potentially increase the amount of exercise or healthy eating habits one performs and ultimately benefit their client’s overall well-being. Furthermore, there are implications for grasping a better understanding of how and why people might attempt to engage in healthy behaviors, or fail to do so. By understanding the way in which someone who

possesses traits already shown to be related to goal progress and goal attainment talk to themselves, clinicians or health coaches could potentially work with clients to increase their use of certain types of self-talk that have been shown to correlate with factors related to obtaining health-related personal goals.

This study is the first to explore the relationships between one's self-talk, perceived competence, style of motivation, and frequency of exercising and healthy eating. Now, future research can continue to build on these findings and extend further into other areas of a healthy lifestyle.

REFERENCES

- Brinthaup, T. M., Benson, S. A., Kang, M., & Moore, Z. D. (2015). Assessing the accuracy of self-reported self-talk. *Frontiers in Psychology, 6*(570), 1-12. doi: 10.3389/fpsyg.2015.00570.
- Brinthaup, T. M., Hein, M. B., & Kramer, T. E. (2009). The Self-Talk Scale: Development, factor analysis, and validation. *Journal of Personality Assessment, 91*(1), 82-92. doi: 10.1080/00223890802484498
- Gammage, K. L., Hardy, J., & Hall, C. R. (2001). A description of self-talk in exercise. *Psychology of Sport and Exercise, 2*(4), 233-247. doi: 10.1016/S1469-0292(01)00011-5
- Hamilton, J. D., Kendall, P. C., Gosch, E., Furr, J. M., & Sood, E. (2008). Flexibility within fidelity. *Journal of the American Academy of Child & Adolescent Psychiatry, 47*(9), 987-993. doi: <http://dx.doi.org/10.1097/CHI.ObO13e31817eed2f>
- Hardy, J. (2006). Speaking clearly: A critical review of the self-talk literature. *Psychology of Sport and Exercise, 7*(1), 81-97. doi:10.1016/j.psychsport.2005.04.002
- Hardy, J., Hall, C. R., & Hardy, L. (2004). A note on athletes' use of self-talk. *Journal of Applied Sport Psychology, 16*(3), 251-257. doi: 10.1080/10413200490498357
- Hagger, M. S., Hardcastle, S. J., Chater, A., Mallett, C., Pal, S., & Chatzisarantis, N. L. D. (2014). Autonomous and controlled motivational regulations for multiple health-related behaviors: Between- and within-participants analyses. *Health Psychology and Behavioral Medicine, 2*(1), 565–601. doi: 10.1080/21642850.2014.912945

- Kendall, P. C., & Treadwell, K. R. (2007). The role of self-statements as a mediator in treatment for youth with anxiety disorders. *Journal of Consulting and Clinical Psychology, 75*(3), 380. doi: 10.1037/0022-006X.75.3.380
- Koestner, R., Otis, N., Powers, T. A., Pelletier, L., & Gagnon, H. (2008). Autonomous motivation, controlled motivation, and goal progress. *Journal of Personality, 76*(5), 1201-1230. doi: 10.1111/j.1467-6494.2008.00519.x
- Levesque, C. S., Williams, G. C., Elliot, D., Pickering, M. A., Bodenhamer, B., & Finley, P. J. (2007). Validating the theoretical structure of the Treatment Self-Regulation Questionnaire (TSRQ) across three different health behaviors. *Health Education Research, 22*(5), 691-702. doi: <https://doi.org/10.1093/her/cyl148>
- Mata, J., Silva, M. N., Vieira, P. N., Carraça, E. V., Andrade, A. M., Andrade, S. R., Coutinho, L. B., Sardinha, & Teixeira, P. J. (2009). Motivational “spill-over” during weight control: Increased self-determination and exercise intrinsic motivation predict eating self-regulation. *Health Psychology, 28*(6), 709. doi: 10.1037/a0016764
- Pelletier, L. G., Dion, S. C., Slovinec-D'Angelo, M., & Reid, R. (2004). Why do you regulate what you eat? Relationships between forms of regulation, eating behaviors, sustained dietary behavior change, and psychological adjustment. *Motivation and Emotion, 28*(3), 245-277. doi:10.1023/B:MOEM.0000040154.40922.14
- "Perceived Competence Scales". Retrieved from <http://selfdeterminationtheory.org/perceived-competence-scales/>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78. doi: <http://dx.doi.org/10.1037/0003-066X.55.1.68>

- Senay, I., Albarracín, D., & Noguchi, K. (2010). Motivating goal-directed behavior through introspective self-talk: The role of the interrogative form of simple future tense. *Psychological Science, 21*(4), 499–504. doi: 10.1177/0956797610364751
- Sheldon, K. M., & Elliot, A. J. (1998). Not all personal goals are personal: Comparing autonomous and controlled reasons for goals as predictors of effort and attainment. *Personality and Social Psychology Bulletin, 24*(5), 546-557.
- Standage, M., Sebire, S. J., & Loney, T. (2008). Does exercise motivation predict engagement in objectively assessed bouts of moderate-intensity exercise?: A self-determination theory perspective. *Journal of Sport & Exercise Psychology, 30*(4), 337. doi: <https://doi.org/10.1123/jsep.30.4.337>
- VandenBos, G. R., & American Psychological Association. (2007). *APA dictionary of psychology*. Washington, DC: American Psychological Association.
- Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The health-promoting lifestyle profile: development and psychometric characteristics. *Nursing Research, 36*(2), 76-81.
- Williams, G. C., & Deci, E. L. (1996). Internalization of biopsychosocial values by medical students: a test of self-determination theory. *Journal of Personality and Social Psychology, 70*(4), 767. doi: <http://dx.doi.org/10.1037/0022-3514.70.4.767>
- Williams, G. C., Ryan, R. M., & Deci, E. L. (n.d.). Health-Care, Self-Determination Theory Packet. Accessed 3 Nov. 2016
- Wilson, P. M., Mack, D. E., & Grattan, K. P. (2008). Understanding motivation for exercise: A self-determination theory perspective. *Canadian Psychology/Psychologie Canadienne, 49*(3), 250-256. doi:10.1037/a0012762

Wilson, P. M., Rodgers, W. M., Blanchard, C. M., & Gessell, J. (2003). The relationship between psychological needs, self-determined motivation, exercise attitudes, and physical fitness. *Journal of Applied Social Psychology*, 33(11), 2373-2392. doi: 10.1111/j.1559-1816.2003.tb01890.x

APPENDICES

APPENDIX A: IRB APPROVAL

IRB
INSTITUTIONAL REVIEW BOARD
 Office of Research Compliance,
 010A Sam Ingram Building,
 2269 Middle Tennessee Blvd
 Murfreesboro, TN 37129



EXEMPT APPROVAL NOTICE

11/4/2015

Investigator(s): Kyle Long
 Department: Psychology
 Investigator(s) Email: kr4f@mtmail.mtsu.edu
 Protocol Title: "How People Think about Healthy and Unhealthy Behaviors"
 Protocol ID: 16-1105

Dear Investigator(s),

The MTSU Institutional Review Board, or a representative of the IRB, has reviewed the research proposal identified above and this study has been designated to be EXEMPT.. The exemption is pursuant to 45 CFR 46.101(b) (2) Educational Tests, Surveys, Interviews, or Observations

The following changes to this protocol must be reported prior to implementation:

- Addition of new subject population or exclusion of currently approved demographics
- Addition/removal of investigators
- Addition of new procedures
- Other changes that may make this study to be no longer be considered exempt

The following changes do not have to be reported:

- Editorial/administrative revisions to the consent of other study documents
- Changes to the number of subjects from the original proposal

All research materials must be retained by the PI or the faculty advisor (if the PI is a student) for at least three (3) years after study completion. Subsequently, the researcher may destroy the data in a manner that maintains confidentiality and anonymity. IRB reserves the right to modify, change or cancel the terms of this letter without prior notice. Be advised that IRB also reserves the right to inspect or audit your records if needed.

Sincerely,

Institutional Review Board
 Middle Tennessee State University

NOTE: All necessary forms can be obtained from www.mtsu.edu/irb.

APPENDIX B: INFORMED CONSENT

Informed Consent

Middle Tennessee State University

Project Title: How People Think about Exercise and Eating Behaviors

Purpose of Project: This study examines the differences in thoughts and feelings when people participate in exercise and eating behaviors.

Procedures: The survey consists of 92 items and will take approximately 20 minutes to complete. Survey items pertain to common thoughts about oneself in regard to exercise and eating behaviors, the frequency of engaging in behaviors that pertain to nutrition and physical activity, perceived competence in being able to make or maintain a change toward a healthy behavior, why participants do these healthy behaviors, and standard demographic items. All data collected will remain anonymous and will be used to answer the research question "how do people think and feel about engaging in exercise and eating behaviors?"

Risks/Benefits: There are no risks in participating in this study. The benefit of participating will be its contribution to a research area that has yet to be explored.

Confidentiality: No personally identifiable information will be collected; all responses will be anonymous. All data will be stored in a secure location on campus.

Principal Investigator/ Contact Information: Kyle Long/kr1f@mtmail.mtsu.edu

Participating in this project is voluntary, and refusal to participate or withdrawing from participation at any time during the project will involve no penalty or loss of benefits to which you might otherwise be entitled. All efforts, within reason, will be made to keep the personal information in your research record private but total privacy cannot be promised, for example, your information may be shared with the Middle Tennessee State University Institutional Review Board. In the event of questions or difficulties of any kind during or following participation, you may contact the Principal Investigator as indicated above. For additional information about giving consent or your rights as a participant in this study, please feel free to contact the MTSU Office of Compliance at (615) 494-8918.

Consent

I have read the above information and my questions have been answered satisfactorily by project staff. I believe I understand the purpose, benefits, and risks of the study and give my informed and free consent to be a participant.

SIGNATURE

DATE

APPENDIX C: STS EXERCISE

STS (exercise)

Researchers have determined that all people talk to themselves, at least in certain situations or under particular circumstances. Each of the following items applies to your attitude towards exercising. We are interested in knowing how you may “talk to yourself” or carry on an internal conversation with yourself (either silently or out loud) after exercising.

Determine how true each item is for you personally by circling the appropriate number next to each item. Assume that each item belongs with the statement: “Over the past few days, I have talked to myself when...” Be sure to rate each item. Please take your time and think carefully about each item. Use the following scale to rate each item, by circling the appropriate number.

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

I TALK TO MYSELF WHEN...

- | | | | | | |
|--|---|---|---|---|---|
| 1. I should have exercised | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| 2. I feel good about exercising | 1 | 2 | 3 | 4 | 5 |
| 3. I need to figure out what I need to do to enable myself to exercise more | 1 | 2 | 3 | 4 | 5 |
| 4. I’m imagining how other people respond to my exercise behavior | 1 | 2 | 3 | 4 | 5 |
| 5. I consider how happy I am after exercising | 1 | 2 | 3 | 4 | 5 |
| 6. I want to analyze comments related to my exercise behavior that someone recently said to me | 1 | 2 | 3 | 4 | 5 |
| 7. I feel out of shape | 1 | 2 | 3 | 4 | 5 |
| 8. I’m proud of myself for exercising | 1 | 2 | 3 | 4 | 5 |
| 9. I’m mentally exploring a possible course of action when attempting to exercise more often | 1 | 2 | 3 | 4 | 5 |
| 10. I’m really upset with my exercise habits | 1 | 2 | 3 | 4 | 5 |
| 11. I try to anticipate what others will think about my exercise behaviors | 1 | 2 | 3 | 4 | 5 |
| 12. I’m giving myself instructions or directions about how I could exercise more often | 1 | 2 | 3 | 4 | 5 |
| 13. I want to reinforce myself for exercising | 1 | 2 | 3 | 4 | 5 |

14. I worry that something bad will come from my exercise habits 1 2 3 4 5
15. I want to remind myself of what I need to do in order to exercise more often 1 2 3 4 5
16. I want to replay something that I've said to another person about my exercise behavior 1 2 3 4 5
-

APPENDIX D: STS DIET

STS (diet)

Researchers have determined that all people talk to themselves, at least in certain situations or under particular circumstances. Each of the following items applies to your attitude towards engaging in eating behaviors. We are interested in knowing how you may “talk to yourself” or carry on an internal conversation with yourself (either silently or out loud) after engaging in eating behaviors.

Determine how true each item is for you personally by circling the appropriate number next to each item. Assume that each item belongs with the statement: “Over the past few days, I have talked to myself when...” Be sure to rate each item. Please take your time and think carefully about each item. Use the following scale to rate each item, by circling the appropriate number.

1 2 3 4 5
 Never Seldom Sometimes Often

Very Often

I TALK TO MYSELF WHEN...

- | | | | | | |
|--|---|---|---|---|---|
| 1. I should have eaten something more healthy | 1 | 2 | 3 | 4 | 5 |
| 2. I feel good about eating something healthy | 1 | 2 | 3 | 4 | 5 |
| 3. I need to figure out what I need to do to enable myself to eat healthier | 1 | 2 | 3 | 4 | 5 |
| 4. I'm imagining how other people respond to my eating behavior | 1 | 2 | 3 | 4 | 5 |
| 5. I consider how happy I am after a healthy meal | 1 | 2 | 3 | 4 | 5 |
| 6. I want to analyze comments related to my eating behavior that someone recently said to me | 1 | 2 | 3 | 4 | 5 |
| 7. I feel bad for what I ate | 1 | 2 | 3 | 4 | 5 |
| 8. I'm proud of myself for eating healthy | 1 | 2 | 3 | 4 | 5 |
| 9. I'm mentally exploring a possible course of action when attempting to eat better | 1 | 2 | 3 | 4 | 5 |
| 10. I'm really upset with my eating habits | 1 | 2 | 3 | 4 | 5 |
| 11. I try to anticipate what others will think about my eating behaviors | 1 | 2 | 3 | 4 | 5 |
| 12. I'm giving myself instructions or directions about how I could eat better | 1 | 2 | 3 | 4 | 5 |
| 13. I want to reinforce myself for eating something healthy | 1 | 2 | 3 | 4 | 5 |

14. I worry that something bad will come from my eating habits 1 2 3 4 5
15. I want to remind myself of what I need to do in order to eat better 1 2 3 4 5
16. I want to replay something that I've said to another person about my eating behavior 1 2 3 4 5
-

APPENDIX E: DEMOGRAPHICS

Demographic Information Form

Instructions: Please provide a response for each of the following questions:

1. What is your age? _____

2. What is your approximate weight (pounds)? _____

3. What is your approximate height (feet and inches)? _____

4. What is your sex? (Circle one)

Female Male Other

5. With which racial or ethnic category do you identify? (Circle One)

African American Asian/Pacific Islander Caucasian Latino

Other: _____

6. Have you ever been formally diagnosed with or received treatment for an eating disorder? (Circle One) Yes No

7. Are you satisfied with your current level of exercise frequency? (Circle One)

Yes No

8. Are you satisfied with your current healthy eating habits? (Circle One)

Yes No

9. How often after exercising do you post something on social media related to your exercise behaviors? (Circle One) Never Sometimes Often Routinely

10. How often after eating something healthy do you post something on social media related to what you had eaten? (Circle One)

Never

Sometimes

Often

Routinely