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Intraindividual variability and relations between daily affect and physical activity among community -dwelling older women

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Abstract

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The current study investigated individual and group-level daily relations between affect and physical activity among 37 non-sedentary community-dwelling older women. The study expected that (a) positive affect would hold a significant, positive synchronous relation with physical activity and (b) negative affect would hold a significant, negative synchronous relation with physical activity over six consecutive days. Women over age 55 (*M* = 71.5, *SD* = 9.4) participated by completing four daily assessments (8am, 12pm, 4pm, 8pm) of positive and negative affect and physical activity on a hand-held computer Monday through Saturday. Affect was measured using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Physical activity was measured using the Physical Activity Scale (PAS; Aadhal & Jorgensen, 2003). The PAS provided information on the level (i.e., metabolic equivalent values) and time in a physical activity to be later calculated as estimated energy expenditure. Regression curve estimations were conducted to determine individual relations among study variables. Thirty-five percent of participants held a significant positive relation between positive affect and physical activity over the study period. For negative affect and physical activity, 13.5% of participants held a significant, primarily negative relation between negative affect and physical activity. For both sets of analyses, significant linear and quadratic trends emerged. Group-level analyses used structural equation modeling to test day-to-day relations between affect and physical activity. No significant paths from affect to physical activity emerged; however early-week positive affect and physical activity predicted mid-week positive affect and physical activity, respectively. Repeated measures MANOVAs were conducted to determine if there were within-day differences in affect and physical activity. The study found both positive affect and physical activity follow similar, significant cubic trends within a day. Participants began their day with low levels of positive affect and physical activity, reported highest levels by 12pm, and a steady decline the remainder of the day. Discussion focuses on the future development of reliable and valid measures of daily affect and physical activity, the use of hand-held computers among older women, and potential intervention implications regarding diurnal variations in affect and physical activity among community-dwelling older women.

Dedication

I would like to dedicate this dissertation to my loving, supportive, and dedicated husband, Jason Steele.

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Chapter 1: Statement of Purpose

Lifespan theories suggest that an individual's placement on the continuum from health to illness is a function of several interacting biological, psychological, and socio-contextual factors (Coe, 1999; Leventhal, Rabin, Leventhal, & Burns, 2001). Additionally, these interacting factors occur over time, thus stable developmental changes and short-term variability must be considered (Nesselroade, 1991). The main purpose for the current study was to investigate, within a sample of community-dwelling older women, the daily relations among psychological (affect) and physical (physical activity) factors influencing the movement toward the health and well-being continuum.

Physical activity can be defined as any body movement resulting in energy expenditure (Casperson, Powell, and Christenson, 1995; USDHHS, 1996). The U.S. Department of Health and Human Services states that to gain any health benefits from being physically active, adults should conduct 30 minutes of moderate levels of physical activity on most days of the week. Unfortunately, the majority of older adults do not meet suggested recommendations (USDHHS). Approximately 25% of adults are sedentary during leisure time and about 25% of adults over age 45 are *regularly* physically active (USDHHS). With a multitude of previous research demonstrating the mental and physical health benefits of being physically active into late adulthood (Blumenthal et al., 1989; Brach et al., 2004; Fiatatrone, et al., 1994; Moore & Blumenthal, 1998), it is important to consider daily factors that might affect older adults' physical activity levels. Longitudinally, factors such as depression and functional disability have been shown to decrease activity and increase sedentary behavior in older adults (Leventhal, et al., 2001; Ostir, Markides, Black, & Goodwin, 2000; Pennix, Guralnik, Ferruci, Simonsick, Deeg, & Wallace, 1998). Less is known about the relation between affect and physical activity

(Steptoe, Kimball, & Basford, 1998), although a variety of studies have found significant relations between daily affect and physiological measures of health, such as blood pressure (Carels, Blumenthal, & Sherwood, 2000; Raikkonen, Matthews, Flory, & Owens, 1999). Additionally, few studies have conducted such research among older adults (Focht, Gauvin, & Rejeski, 2004; Leventhal, et al., 2001; Vendrig & Lousberg, 1997).

Research on affect and physical activity is particularly important in late adulthood, because lifespan theories such as Carstensen's (1992) socioemotional selectivity theory suggests that older adults are likely to hold emotion goals as important in late life. Therefore, older adults are more likely than younger adults to experience more positive affect and less negative affect as close emotional bonds become priority. The experience of positive affect might be an important factor in predicting physical activity levels in late adulthood. Also, previous intervention and longitudinal research have found that individuals who are more physically active are protected against and have decreased levels of depression and anxiety symptoms and increased levels of positive affect (see USDHHS for review; Hanson, Stevens, & Coast, 2001). To conclude, physical activity and positive affect likely share a synchronous daily relation, influencing each other over time.

Research has found gender differences in both physical activity and affect among men and women (Carstensen, Pasupathi, & Mayr, 2000; USDHHS, 1996). Specifically, men are more likely to be physically active than women (Steptoe, et al., 1998; USDHHS). Therefore, a research focus on increasing physical activity in women is priority. A substantial amount of research has found gender differences in affect. For instance, women report more intense levels of positive and negative affect in longitudinal and daily measurement studies (Birditt & Fingerman, 2003; Fujita, Diener, & Sandvik, 1991; Wood, Rhodes,, & Whelan, 1989). This research is important, because it suggests that daily affect could be related to physical activity differently for women and men. The current study chose to begin this new area of research with a focus on older women because (a) affect appears to fluctuate more in women than men, (b) women are more likely to live longer and with more disability than men and (c) women are more likely to be less physically active than men.

The current study investigated the relations between daily affect and physical activity in non-sedentary, community-dwelling older women. Specifically, the study collected data on daily positive affect, negative affect and physical activity at four time points during the day (0800hr, 1200hr, 1600hr, 2000hr) over six consecutive days (Monday – Saturday). Although similar methods have been used in emotion and physiological health research among older adults (Focht et al., 2004; Raikkonen et al., 1999; Steptoe, Roy, & Evans; 1996), no studies have explored the relations between positive affect and physical activity among community-dwelling older women. Finally, this study incorporated the use of a hand-held computer to collect participant data. This mode of data collection facilitates the control of extraneous factors in a way not available in the paper-and-pencil-methods. Thus, the technological improvement in data collection methods aided in the accuracy of daily reporting of affect and physical activity. Results from this study provide valuable information that could eventually be applied to physical activity and affect intervention training in older women.

Chapter 2: Introduction (Parts I-VII)

Part I: Conceptual Introduction

The trajectory of individual health is often conceptualized on a continuum from health to illness (George, 2001). The concept of successful aging includes multiple objective and subjective indicators of psychological and physical well-being (Baltes & Baltes, 1990; Baltes & Mayer, 1999; Diener, Suh, & Lucas, 1999; Lawton, 1983). One question often asked by researchers interested in successful aging is: What are the factors contributing to an individual's placement on the health-illness continuum at a given point in time? These factors often involve biological, physical, psychological, and socio-contextual variables.

Similarly, proponents within the field of positive psychology ask whether an individual who is living the "average life" as indicated by psychological and physical well-being measures can improve to lead the 'good life' (Seligman & Csikszentmihalyi, 2001). Parallel to successful aging, researchers in positive psychology often measure the "good life" with indicators of emotional well-being, such as high levels of positive affect, low levels of negative affect, and the absence of depression (Diener et al., 1999). Important to keep in mind, however is that there are individual differences in (a) the mean level of positive and negative affect and (b) individual variability in daily measures of positive and negative affect (Watson, 1988). To understand how older adults are to improve their emotional lives, one must consider within-person variability in positive and negative affect and affect's relations within important daily life domains (e.g., physical activity).

Finally, the contextualist worldview encourages that a research focus on healthy aging should be studied within a variety of contexts that change over time and affect one another in a multidirectional manner (Smith & Baltes, 1999). Factors that determine health at any age period in the life-span involve the combination of biological, psychological, and socio-environmental factors (George, 2001; Leventhal, et al., 2001). The accumulation and interaction of these factors shapes and determines health throughout the lifespan (Coe, 1999; Leventhal et al.; Whitman, 1999). Additionally, Nesselroade (1991) proposed that to accurately assess human development (i.e., older adults' movement along the health and illness continuum), studies must consider (a) short-term variability within the individual (e.g., daily affect states), (b) stable differences between individuals (e.g., personality), and (c) changes within the individual (e.g., development). The current study will attempt to address the relations between intraindividual variability in positive affect, negative affect and physical activity in the daily lives of community-dwelling older women.

Part II: Physical Activity

Part II will introduce the first main study variable, physical activity. Specifically, the first section will discuss research regarding the benefits of physical activity in mid to late adulthood, as well as recent estimates of physical activity levels among older women. The second section will review operational definitions and measurement of physical activity among older adults in recent empirical investigations.

Physical activity in Mid to Late Adulthood

One way in which an older adult moves along the continuum from illness to health is to be physically active (Robert Wood Johnson Foundation, RWJF, 2001). As individuals age, health becomes a salient life domain, whereby older adults have increased experiences with disease and functional limitations (Leventhal et al., 2001). As stated by successful aging proponents, it is never too late for older adults to enjoy the benefits of physical activity (Leventhal et al.). In fact, several aging researchers and government agencies have called upon investigators and practitioners to add a focus of health promotion to their emphasis on disease prevention (AARP, 2002; Leventhal et al.; George, 2001; USDHHS, 1996). Previous research has found that older adults who report being at least moderately physically active not only live longer and have less physical disability, but are less likely to have an early onset of diabetes and cardiovascular disease (Brach, et al., 2004; USDHHS). Additional research has shown that being physically active through exercise can be considered a primary prevention tool, thus reducing the occurrence of physical and mental disease in late adulthood (Blumenthal et al., 1989; Fiatarone et al., 1994; Moore & Blumenthal, 1998).

Although the health benefits of physical activity into late adulthood have been well documented and publicized, a large proportion of the older adult population do not follow recommendations for physical activity. For instance, a recent Surgeon General's report on physical activity and health stated that 65% of older adults reported being physically active during leisure time over the past month (USDHHS, 1996). Using a different measure of physical activity in a longitudinal study from 1984 to 1990, Kovar, Fitti, and Chyba (1992) found that as age increases, regular exercise decreases. Kovar and colleagues found that over 75% of older adults reported not exercising on a regular basis.

Research results investigating the percent of older adults' conducting specific types of health-benefiting physical activities is less promising. For example, (a) cardio-respiratory exercises (i.e., running, walking) prevent cardiovascular diseases, (b) muscle strength, resistance, and balance training prevents functional disability and falls, and (c) stretching promotes flexibility and prevents injury (see USDHHS, 1996 for review). However, studies examining data from the National Health Interview Survey (NHIS) find that less than 20% of adults over age 45 have done strengthening and stretching exercises in the two weeks prior to assessment (see USDHHS for review). Additionally, the percent of individuals participating in these specific activities decreases as age increases (USDHHS). Overall, many middle-aged and older adults are not maintaining adequate levels of physical activity.

Although the benefits of physical activity have been empirically demonstrated, differing measures of physical activity have made it difficult to compare physical activity standards across studies. For instance, studies investigating specific exercises, such as weight training, often overlook the many day-to-day physical activities conducted by adults (e.g., gardening, running errands, etc.; DiPietro, 2001). Perhaps even more interesting, is that older adults themselves have different ideas as to what is meant by physical activity versus exercise (AARP, 2002). In a large national study using five surveys and six different focus groups with older adults, the AARP investigated older adults' attitudes toward physical activity. The study derived several conclusions. Of importance to this study was (a) older adults are aware of the health benefits of physical activity but find the task formidable and (b) the terms physical activity and exercise represent different definitions (AARP). Specifically, older women preferred the term physical activity and would be more agreeable to conducting physical activities (such as gardening, household chores) than exercise behaviors as purposeful physical 'work' (AARP). Therefore, the current study investigated physical activity as it relates to energy expenditure in conducting a variety of common daily activities. Finally, a large literature review conducted by DiPietro concluded that regular lifestyle physical activities (e.g., walking, gardening, etc.) conducted at moderate intensity levels provide unique health benefits when compared to regular fitness activities (e.g., strength training, aerobics, etc.).

Measuring Physical Activity

Physical activity can be defined as any body movement that results in energy expenditure (Caspersen, Powell, & Christenson, 1985; USDHHS, 1996). Therefore, the current study used energy expenditure as the operational definition of physical activity. Energy expenditure is measured by kilogram-calories, or kcals. A kcal is the amount of heat required to increase the temperature of one liter of water by one degree Celsius. To calculate kcals in humans, one must consider an individual's Resting Metabolic Rate (RMR). RMR is the number of kcals one would burn if one were at rest for 24 hours. To calculate an estimation of RMR for older adults, researchers often use the Harris-Benedict Equation (Das et al., 2004). The Harris-Benedict Equation considers an individual's gender, age, height, and weight to mathematically determine the number of kcals expended over a 24-hr period (see Appendix A).

In order to determine the amount of energy expended above and beyond rest (or RMR), one must consider several factors, such as type of activity, frequency, duration, and intensity (Aadhal & Jorgensen, 2003; Conn, Minor, Burks, Rantz, & Pomeroy, 2003, for a review). Although a multitude of research has validated the amount and types of exercise required to produce positive health outcomes, much research is needed to validate physical activity measurements to determine its positive influence on health and well-being in late life (Conn et al.; Leventhal et al., 2001; RWJF, 2001; USDHHS, 1996).

A widely used method of assessing self-reported physical activity is via use of the Compendium of Physical Activities (Ainsworth, et al., 1993). The compendium list includes hundreds of possible physical activities conducted by humans, as well as different variations of each activity. Each physical activity is assigned a MET value, or metabolic equivalent value. A MET value is based on a ratio of one's metabolic rate while physically active to the metabolic rate while at rest (Ainsworth, et al.). For example, a MET value of 1.0 would be an activity that is equivalent to the body at rest (RMR). On the other hand, an activity with a MET value of 2.0 would be an activity whose type/intensity level places energy expenditure at twice that of RMR. To obtain a measure of kcals, or energy expenditure, MET values are considered in a mathematical equation that includes the assigned MET value of the particular activity, the amount of time in the physical activity, and the individual's weight in kilograms (see Appendix B). Calculation of MET values have been shown to be a reliable and valid method for measuring the amount of physical activity, or energy expenditure, conducted by older adults' on a daily basis (Stewart et al., 2001).

The aforementioned method of defining and measuring physical activity was chosen for the current study because it considers (a) the types of physical activities conducted by older adults, and (b) the amount of energy expended is based on individual weight. Inquiring about different types of physical activities, rather than specific exercises was additionally preferred, because the study did not want to change daily behavior by constantly inquiring about specific exercises (see USDHHS for review). Finally, because only a small percent of older adults regularly engage in specific exercises, more global measures of activity may be more useful than measures of specific exercises in studies of middle-aged and older adults.

An additional concern in research examining physical activity is the lack of convergent validity checks. To increase the validity of the study's measurement of physical activity, the current study incorporated an additional measurement of physical activity, the number of steps taken while using a pedometer. Number of steps taken with a pedometer is a useful means of validating energy expenditure, because walking is the preferred method of physical activity among older adults (Conn et al., 2003; USDHHS, 1996). Additionally, previous research has found that daily pedometer use provided accurate assessments of walking activity (Crouter, Schneider, Karabulut, & Bassett, 2003; Tudor-Locke, Williams, Reis, & Pluto, 2002). However, it is important to note that a recent study found that pedometers were less accurate among older adults who had particularly slow gaits, predicting fewer steps than actually taken (Le Masurier & Tudor-Locke, 2003).

Part III: Affect

Part III will provide an in-depth literature review of the current research on positive and negative affect in mid to late adulthood. Specifically, this section will provide definitions, lifespan theory of emotion, and empirical literature establishing the importance of studying affect in late adulthood.

Emotions are embedded within every aspect of the human life course (Magai, 2001). Affect is considered to have two distinct dimensions (Barrett & Russell, 1998; Watson, 1988). One dimension reflects positive affect and the other dimension reflects negative affect (Pennebaker, 1982; Salovey & Birnbaum, 1989; Watson). Factor analysis studies have found that positive and negative affect as distinct, separate dimensions (e.g., Positive and Negative Affect Schedule; Watson, Clark, & Tellegen, 1988). Thus, positive affect and negative affect are separate, unrelated constructs. Typically, affect measures identify positive and negative aspects of affect, as well as the intensity of the affect state (Watson, Clark, & Tellegen, 1988). For example, a person who generally experiences positive affect might experience certain positive emotions at different intensities throughout the day. Therefore, the current study incorporated the measurement of both positive and negative dimensions of affect and range of affect intensity.

There are very few lifespan theories on emotional development in late adulthood (Carstensen, 1992; Labouvie-Vief, Hakin-Larson, DeVoe, & Schoeberlein, 1989). One widely accepted theory is the socioemotional selectivity theory (Carstensen). The socioemotional selectivity theory suggests that as time in life becomes shorter, one holds emotional goals as important. As a result, the older adult will (a) reduce social network size to those who are emotionally close, and (b) regulate emotions, whereby negative affect will decline and positive affect will increase (Carstensen).

Research has found that positive and negative affect fluctuate on a daily basis (McNeil, Stones, & Kozma, 1994; Stone, Shiffman, Pickering, & Schwartz, 1996; Watson, 1988). To investigate potential age differences in positive and negative affect, Carstensen, Pasupathi, and Mayr (2000) studied the daily experiences of positive and negative affect using an experience sampling method for one week. The study recruited 184 adults ages 18 to 94. Participants were paged five times a day for seven days. At each fixed-random electronic paging session, participants were asked to complete the frequency and intensity of 19 affects (11 negative, 8 positive) in a paper booklet. Results found that (a) positive affect was more stable than negative affect, (b) age was not related to the frequency of positive affect, and (c) negative affect declined with age until age 60, whereby it stabilized (Carstensen et al.). There were no age differences in the intensity of the emotions. Although the expected finding of greater positive affect frequency in later age was not significant, there was a slight positive relation between age and positive affect (Carstensen et al.). This null finding might have been due to the limited number of positive affect words presented in the study. A more recent study by Pasupathi and Carstensen (2003) found age differences in positive and negative affect during an experience sampling method of reminiscence and social activities (N = 129, M age = 49.7). The study found that older adults were more likely to experience positive affect during reminiscence experiences than younger adults (Pasupathi & Carstensen).

Previous research by Mroczek and Kolarz (1998) studied age differences in positive and negative affect in a large cross-sectional design with one time of measurement. The study included over 2,700 adults ages 25-74. The study found that age was positively related to positive affect and negatively related to negative affect. Lastly, a more recent study by Birditt & Fingerman (2003) investigated age differences in emotions among 185 participants in five different age groups (i.e., adolescents, young adults, middle-aged adults, young-old adults, and oldest-old adults). Using an open-ended report of feelings after a recent emotional problem with a social network individual, results found that adolescents and younger adults were more likely to report being angry than older adults. Theoretical and empirical research regarding emotions in late adulthood are very important to the understanding of how positive affect, in particular, is related to the physical lives of older adults.

Part IV: Affect and Physical Activity: An Intertwined Relation

The first section of Part IV will provide an in-depth review of empirical research linking affect and physical activity among adults. The second section will discuss previous research on intraindividual variability in affect and health. Lastly, the third section will provide a theoretical and empirical rationale for why it was expected that there would be significant synchronous relations between daily affect and physical activity.

Relations among Affect and Health

Previous research has established a link between emotional well-being and health. Emotional well-being has been defined as high levels of positive affect, low levels of negative affect, and/or the absence of depression (Diener, et al., 1999). Specifically, higher levels of emotional well-being have been found to be positively related to (a) better self-rated health (Benyamini, Idler, Leventhal, & Leventhal, 2000), (b) better functional ability (Patrick, Johnson, Goins, & Brown, 2003; Ostir, et al., 2000, Pennix et al., 1998), and (c) higher levels of physical activity (van Gool, Kempen, Pennix, Deeg, Beekman, & van Eijk, 2003). Although associations among global measures of emotion and physical health have been established, it is also important to investigate these relations in the everyday lives of adults.

Previous research has found a link between daily affect and health (Lawton, DeVoe, & Parmelee, 1995; Pennebaker, 1982; Watson, 1988). Specifically, positive affect has been consistently found to have significant positive relations with positive, or engagement, indicators of well-being such as (a) social activity, (b) exercise, (c) extraversion, and (d) satisfaction with life (Diener et al., 1999; Rook, 2001; Steptoe, Kimbell, & Basford, 1998; Watson, 1988). Negative affect has consistently been found to have significant positive relations with negative, or avoidant, indicators well-being, such as (a) health complaints, (b) perceived stress, and (c) neuroticism (Carstensen, et al., 2000; Gijsbers van Wijk, Huisman, & Kolk, 1999; Leventhal, Hansell, Diefenbach, Leventhal, & Glass, 1996; Salovey & Birnbaum, 1989; Watson; Watson & Pennebaker, 1989). Lastly, positive affect has been found to have a positive relation and negative affect a negative relation with psychophysiological measures, such as ambulatory blood pressure in adults representing a diversity of age groups (Carels, et al., 2000; Raikkonen, et al., 1999; Shimomitsu & Theorell, 1996; Steptoe, et al., 1996). While there is an abundance of research establishing the aforementioned relations, there is minimal research on the associations among of daily affect and *physical activity*.

Few studies have investigated the relations between daily affect and physical activity (Focht, et al., 2004; Steptoe et al., 1998; Steptoe et al., 1996; Watson, 1988). Watson (1988), in a sample of 80 college students, found a modest positive relation between daily positive affect and daily exercise behavior. Watson did not find negative affect and exercise to be related. Steptoe et al., (1998) investigated the relations between exercise, daily stress, and affect among 72 young adults who exercised between one to four days a week. Results found that positive affect was higher at the end of exercise days than no exercise days for women only. Additionally, depressed affect was lower at the end of exercise than no exercise days. Another study conducted by Steptoe, et al. (1996) investigated the daily relations between negative affect frequencies, ambulatory blood pressure, and physical activity among 49 male firefighters (*M* age = 24.8). Results found that increases in blood pressure were a result of the simultaneous experiences of increased negative affect and increases in physical activity during working hours. Although this study offers important information regarding the significant relations between affect and physical activity, there are several problems with the study. First, the study did not measure positive affect. Second, the study only included younger men in a specific occupation. Third, the study used a crude measure of physical activity, indicating the extent to which they were currently active overall (i.e., low, moderate, vigorous).

Lastly, Raikkonen and colleagues (1999) conducted an ambulatory blood pressure study for three days in 100 middle-aged adults. Participants were asked to record positive and negative affect as rated by 17 adjectives and current intensity and context of physical activity (e.g., moderate, sitting, and interacting with someone) (Raikkonen et al.). Although results found significant relations between (a) positive (positive relation) and negative affect (negative relation) and ambulatory blood pressure and (b) physical activity (positive relation) and ambulatory blood pressure, the study failed to test the potential relations between positive and negative affect and physical activity.

Research investigating the relations between affect and physical activity among *older adults* is minimal. In fact, the research investigating the relations between daily affect and physical activity among older adults has almost been solely conducted in pain research (Focht et al., 2004; Vendrig & Lousberg, 1997). Vendrig and Lousberg investigated daily fluctuations in affect, physical activity, and pain experiences in 57 chronic pain patients (*M* age = 42.3). This study used an experience sampling method to assess affect, pain, and physical activity. Specifically, participants were beeped at random intervals eight times a day for 6 consecutive days. When the participant was beeped, they were instructed to fill out a booklet of surveys. Results found significant within-individual relations between affect and pain intensity for one-third of the participants. Specifically, higher levels of pain intensity was related to higher levels of negative affect and lower levels of positive affect (Vendrig & Lousberg). No significant within-person relations were found between (a) affect and physical activity and (b) pain and physical activity. However, it should be reported that mean physical activity levels over all participants were fairly low ($M = 1.2$, $SD = 0.6$ on a 6 point scale) within the chronic pain participants. Thus, most of the participants were fairly sedentary. Additionally, only one item measure of physical activity was used, inquiring the extent to which participants did nothing (0) to doing heavy physical work (6). Also, only one item was used to assess affect (i.e., negative to positive on a continuum) (Vendrig & Lousberg).

Focht and colleagues (2004), using a sample of 32 older adults (25 women, 7 men, M_{age} = 69.1) with knee osteoarthritis, investigated the daily variations in the relations between affect, physical activity, stress, and pain. Participants were part of the study for six consecutive days, whereby they carried a pager and paper booklet from 8:00 am to 9:30 pm. Physical activity was measured by incorporating exercise and non-exercise days as part of a clinical intervention. Participants were paged, in a stratified random schedule, five times a day on exercise days and six times a day on non-exercise days. When paged, participants were asked to report on the study measures. Physical activity questions asked the participant to report the physical activity they were currently conducting. Affect was measured using the Exercise-Induced Feeling Inventory (EFI; Gauvin & Rejeski, 1993). This measure assessed positive engagement, tranquility, revitalization, and physical exhaustion. Results found that feeling states as measured by the EFI did not necessarily improve post-exercise as has been found for younger adults (Focht et al.). While the study used similar methodology as the current study, it was specifically interested in exercise-related physical activity and exercise-related affect. The current study will improve upon these findings by looking at physical activity as it relates to everyday physical activities related to energy expenditure. In addition, the study will include a general measure of positive affect, rather than a domain-specific, exercise-related measure of positive affect. The reason the current study used more general measures, was because the participants were not going through an intervention as was the case in Focht et al. The current study's main purpose was to assess the relations between affect and physical activity in the daily lives of community-dwelling older women.

A final, non-pain related, study on the relations between daily affect and physical activity was conducted by Gauvin, Rejeski, and Reboussin (2000). Gauvin and colleagues investigated daily variations in physical activity and daily affect in a sample of active, middle-aged women. Study measures and methods were similar to those discussed in Focht et al. (2004). However, the sample for this study was recruited from a local health club facility. Investigating within-day relations, results found that positive affect was higher on physically activity days than non-physically active days. This study provided evidence that affect and physical activity hold a significant, synchronous positive relation for older women. The current study will contribute to

Gauvin and colleagues' findings by investigating the day-to-day relations between affect and physical activity among non-sedentary community-dwelling older women.

Based on extant previous literature establishing the significant relation between positive affect and engagement activities, such as social interactions and exercise (Rook, 2001; Steptoe et al., 1998; Watson, 1988), it was expected that the current study would find a positive daily relation between positive affect and physical activity. Studies investigating negative affect and physical health have been mixed. In studies that have included both positive and negative affect, negative affect was not found to be related to activity (Watson, 1988). However, in studies investigating only negative affect or a majority of negative affective words (versus positive) has found negative relations between negative affect and physical activity (Raikkonen et al., 1999; Steptoe et al., 1996; Vendrig & Lousberg, 1997). Thus, the current study explored the potential negative relations among negative affect and physical activity. Lastly, it should be noted that previous studies including measures of physical activity did not adequately operationally define and measure physical activity.

Intraindividual Variability in Affect and Health

Individuals participate in different daily activities and encounter different daily stressors. Important for applied and intervention purposes, is the movement beyond the measurement level of affect and physical activity toward the important relations between physical activity and positive affect within the *individual*. For instance, it is important to determine if (a) positive affect and physical activity are related for an individual over time and (b) if intraindividual variability in positive affect and physical activity are related over time. To apply findings to help an individual's daily physical and emotional health, one must be able to determine how positive affect and physical activity fluctuate within the individual over the course of a day or several days. For instance, previous research by Strauss, MacDonald, Hunter, Moll, and Hultsch (2002) and Li, Aggen, Nesselroade, and Baltes (2001) found that fluctuations on cognitive performance tasks (e.g., response time in word recognition task, spatial memory) was significantly positively related to intraindividual fluctuations in physical performance, such as gait, blood pressure, and fingertapping speed. Watson (1988) found that individuals who fluctuated more in negative and positive affect, had stronger relations with well-being indicators than participants who remained stable. Shimomitsu and Theorell (1996) studied a sample of 58 middle-aged adults on daily blood pressure and affect, every hour, for four consecutive days. The study found that intraindividual variability in blood pressure was linearly related to fluctuations in positive (positive relation) and negative affect (negative relation) states. The proposed study expected to find that within-person variability in affect will be related to fluctuations in physical activity.

Affect and Physical Activity: A Synchronous Relation

A variety of studies have found a link between affect and health, establishing that the two are intertwined (Pennebaker, 1982, Watson, 1988). For instance, research has established both the beneficial effects of exercise on affect (Bhui & Fletcher, 2000; Gauvin et al., 2000; Hansen, Stevens, & Coast, 2001; Steptoe et al., 1998; Thayer, Newman, & McClain, 1994) and how positive affect holds a positive influence and negative affect holds a negative influence on physical and mental health (Benyamini, Idler, Leventhal, & Leventhal, 2000; Ostir, Markides, Black, & Goodwin, 2000, Pennebaker, 1982; Pennix et al., 1998, Gijsbers van Wijk, Huisman, & Kolk, 1999). To date, no studies have examined the potential synchronous relations among affect and physical activity over a period of several days within a sample of community-dwelling older women. However, given the aforementioned evidence regarding the significant relations between affect and physical activity, the current study expected to find a significant synchronous relation between affect and physical activity over six consecutive days. In addition, the current study pilot tested three older community-dwelling women on the current study protocol. Results from the pilot project suggested that there would be significant across-day relations between affect and physical activity.

Primary Hypotheses

Individual Daily Relations

Hypothesis 1: It was expected that positive affect and physical activity would be positively related over the study period.

Rationale. A multitude of previous long-term and daily research has found significant postitive relations between positive affect and health outcomes, such as functional ability, exercise, and physical activity among adults (Diener et al., 1999; Ostir et al., 2000; Patrick, Johnson, Goins, & Brown, 2003; Pennix et al., 1998; Steptoe et al., 1998). Thus, the current study expected that daily positive affect and physical activity as measured by energy expenditure would be significantly, positively related over the study period.

Hypothesis 2: It was expected that negative affect and physical activity would be negatively related over the study period.

Rationale. A multitude of previous long-term and daily research has found significant negative relations between negative affect and health outcomes, such as functional ability, exercise, and physical activity among adults (Brach et al., 2004; Carstensen et al., 2000; Leventhal et al., 1996; Ostir et al., 2000; Salovey & Birnbaum, 1989; Steptoe et al., 1998; van Gool, et al., 2003). Thus, the current study expected that daily negative affect and physical activity as measured by energy expenditure would be significantly, negatively related over the study period.

(Carels et al., 2000; Raikkonen, et al., 1999; Steptoe et al., 1998)

Individual Daily Fluctuations

Hypothesis 3: It was expected that intraindividual variability in positive affect would be positively related to intraindividual variability in physical activity over the study period.

Hypothesis 4: It was expected that intraindividual variability in negative affect would be negatively related to intraindividual variability in physical activity over the study period.

Rationale. The rationale for the direction of the relation for individual fluctuations remains the same as mentioned in the first two hypotheses. In terms of fluctuation in affect and physical activity being related stems from research in research by Strauss et al. (2002) and Li et al., (2001) who found that fluctuations in cognitive performance were significantly related to fluctuations in physical performance. Additionally, Watson (1988) found that individuals who fluctuated more in positive and negative affect had stronger relations with indicators of well-being. Thus, the study predicted that if affect has an important, significant relation with physical activity, then fluctuations in one variable should be significantly related to fluctuations in the other domain in the expected direction over the course of the study.

Group Level Hypotheses

Hypothesis 5: It was expected that positive affect and physical activity would predict subsequent positive affect and physical activity levels over the study period, depicting a positive, synchronous relation.

Hypothesis 6: It was expected that negative affect and physical activity would uniquely predict subsequent negative affect and physical activity levels over the study period, depicting a negative, synchronous relation.

Rationale. Justification underlying the presented hypotheses flow from the previously mentioned hypotheses and rationale. However, no studies have investigated the potential day-to-day synchronous relations between affect and physical activity. Previous supportive daily studies by Steptoe et al (1998) and Gauvin et al (2000) indicated that positive affect would hold a significant, positive synchronous relation with physical activity and negative affect would hold a significant, negative synchronous relation with physical activity over the study period.

Secondary Hypotheses

Secondary Group Level Hypotheses

Hypothesis 7: It was expected that positive relations between positive affect and physical activity would remain over the study period, even when third variables were included in the model (i.e., daily uplifts, hassles, positive social interactions, negative social interactions, temperature, and physical symptoms)

Hypothesis 8: It was expected that negative relations between negative affect and physical activity would remain over the study period, even when third variables were included in the model (i.e., daily uplifts, hassles, positive social interactions, negative social interactions, temperature, and physical symptoms)

Rationale. The aforementioned third variables were included in the group-level study hypotheses because they have been shown in previous daily studies to be significantly related to affect and physical activity. Specifically, positive affect has been shown to have significant positive relations with positive daily social interactions (Rook, 2001). Negative affect has been shown to have significant negative relations with daily health complaints and perceived stress (Salovey & Birnbaum, 1989; Watson, 1988; Watson & Pennebaker). It was expected that these third variables might influence the daily relations between affect and physical activity, thus were included in the group-level analyses.

Exploratory Hypotheses

Group Level Differences in Stability

Exploratory 1: Individuals who were more stable in positive affect would be significantly different from individuals who were less stable in positive affect on dependent measures of positive affect, negative affect, and physical activity.

Exploratory 2: Individuals who were more stable in negative affect would be significantly different from individuals who were less stable in negative affect on dependent measures of positive affect, negative affect and physical activity.

Exploratory 3: Individuals who were more stable in physical activity would be significantly different from individuals who were less stable in physical activity on dependent measures of positive affect, negative affect, and physical activity.

Rationale. Stability hypotheses were proposed because previous research has found that individuals who are stable in cognitive and performance behaviors were significantly different than individuals who were less stable (Li et al., 2001; Strauss et al., 2002).

Group Level Differences in Physical Activity Recommendations

Exploratory 4: Individuals who met USDHHS' (1996) recommendations for physical activity would have significantly higher levels of physical activity and positive affect and lower levels of negative affect than individuals who did not meet recommendations.

Chapter 3: Methods

Recruitment procedure

Forty two women were recruited and participated in the study. A variety of sampling methods were used to obtain a representative sample of community-dwelling older women. One primary source of recruitment required holding informational meetings at four community-dwelling older adult establishments and organizations in Morgantown, WV. For this method, 41 potential participants were approached. A second recruitment method included posting fliers in local facilities where older adults frequent (n = 10). Example establishments included independent living community mailboxes, grocery stores, public library, recreation centers and exercise facilities. A third method of recruitment involved snowball referrals (n = 6). Despite racial and ethnic homogeneity in the current study sample, efforts were made to recruit older women from diverse racial backgrounds. For example, when attempting to recruit a group of older women from one establishment, about half of the women were not of Caucasian racial background (n = 5).

Sample Description

Participants included 42 women over the age 55 (*M* = 71.5, *SD* = 9.4, *MDN* = 69) and an age range of 56 to 92. Despite efforts to recruit individuals from a diverse racial background, the entire study sample was Caucasian. However, it is noted that the population of West Virginia is 95% Caucasian (US Census, 2000). Approximately 45% of the women were married, 31% were widowed, remaining women were separated, divorced, or single. Fifty-four percent of women lived alone. The majority of participants were retired (79%), with approximately 10% working part-time, 7% full-time, and 5% on disability. Median annual income was between $26,000 and $27,999 (*M* = $22,000-$23,999). Additional demographic information is included in Table 1.

Descriptive health information is presented in Table 2. Participants were asked to report whether or not they were experiencing problems with any of 21 commonly reported medical conditions. On average, women reported three medical conditions currently causing problems (*M* = 3.21, *SD* = 2.53, *R* 0 - 11). The most commonly reported medical conditions were arthritis, high cholesterol, high blood pressure, back problems, diabetes, bladder problems, and cataracts (see Table 2). Participants were required to provide their medical prescription information. On average, participants were taking four prescribed medications (*M* = 3.81, *SD* = 2.99, *R* = 0 – 12).

The study calculated Body Mass Index to determine the percent of the study population that was overweight. According to Table 2, the majority of the study sample was either overweight (36%) or obese (45%). The mean BMI was 30.6 (*SD* = 6.69; R = 20.12 – 53.77), just above the obesity cut-off. In comparison the Center for Disease Control's Behavioral Risk and Surveillance Study (2002), approximately 33% of adults over age 55 in West Virginia self-reported normal BMI, 39% are overweight, and 28% were obese. The current study sample had considerably higher number of obese adults in comparison to state information. However, it is important to mention that the current study used observed weight using an electronic scale. Interestingly, participants in the current study were also asked to self-report weight and height before the actual measurement. On average, participants self-reported 3.4 pounds less than the observed weight.

Additional health information was collected on waist circumference, blood pressure, grip strength and walking speed (see Table 3). Several studies have reported these measures as good indicators of physical health status, physical inactivity, as well as predictors for chronic health conditions and mortality (Brach et al., 2004; Li et al., 2001; Rantanen et al., 2003). Average waist circumference for the study sample was 40.90 inches (*SD* = 6.04, *R* = 30 – 53.50). To be accurate, blood pressure was taken on three different occasions through the course of the baseline assessment. An average of the three assessments was calculated for each participant. The participant average systolic blood pressure was 130.11 (*SD* = 13.35, *R* = 102 – 178.67) and average diastolic blood pressure was 72.54 (*SD* = 9.63, *R* = 56.67 – 90.00). According to the American Health Association (2004) normal blood pressure should include a Systolic mm Hg measurement of less than 120 and a Diastolic mm HG measurement of less than 80. Thus, on average, the current study participants had pre-hypertension due to higher mean levels of systolic measurements.

The current study followed grip strength directions form the Women's Health and Aging Study (WHAS; Rantanen, Vopato, Ferruci, Heikkinen, Fried, & Guralnik, 2003). The current study used the Lafayette Hand Dynamometer (Model 78010) to assess grip strength. The dominant hand was first tested, and then the non-dominant hand was tested. Each hand was tested three consecutive times. An average over the three trials for each hand of each participant was taken. The average grip strength for the study sample's dominant hand was 18.74 kg (*SD* = 7.53, *R* = 1.33 – 38.33), and 18.98 kg (*SD* = 6.04, *R* = 7.00 – 31.00) for the non-dominant hand. The study's average grip strength was similar to that reported by Rantanen and colleagues in 919 community-dwelling older women in Maryland as part of the WHAS.

Screening

To be eligible for the study, women had to meet the following criteria; (a) over age 55, (b) reported at least low levels of weekly physical activity, (c) heard the hand-held computer beep, (d) accurately view the hand-held computer screen, (e) accurately read the questions on the hand-held computer screen, (f) felt comfortable with adhering to the study's daily procedures, and (g) did not work a job that fluctuated on a weekly basis (see Appendix D). Participants screened out of the study were only from organizational meetings. Women were screened out for the following reasons; could not accurately see the palm pilot questions (n = 3), under age 55 (n = 1), could not hear the palm pilot beep (n = 1), and were unwilling to adhere to the study protocol (n = 3). These participants screened themselves out of the study during the informational meeting, in which the primary investigator provided a general overview of the study. Therefore, no other information was obtained on these participants. The screening procedure took place over the phone or in person.

Screening for physical activity. To screen for at least low levels of physical activity, participants were administered the physical activity questionnaire used in the Community Healthy Activities Model Program for Seniors, or CHAMPS (Stewart, et al., 2001). The CHAMPS questionnaire has been used and validated in several ongoing studies (see Stewart et al., 1997, 2001). The CHAMPS questionnaire was chosen as a screening measure for several reasons. First, the measure was validated in large, diverse older adult samples (Stewart et al., 2001; Stewart, Verboncoeur, et al., 2001; Stewart et al., 1997). Second, the questionnaire appropriately adjusts physical activities to those activities most often done by older adults. It also adjusts the MET values for the various activities. For example, instead of asking the older adult how often they lift weights using vigorous effort (MET = 7.0), they will be asked about "moderate to heavy strength training (such as hand-held weights of more than 5 lbs., weight machines or pushups)" and this activity would be assigned a MET value of 4.5 (Stewart et al., 2001).

The CHAMPS questionnaire included 41 questions on different physical activities. The respondent was asked whether or not she had participated in the activity "In a typical week during the past 4 weeks." If the respondent participated in the activity, she was asked (a) how many times a week and (b) how many total hours a week she participated in the specific activity. This questionnaire has been tested in a controlled study on 249 adults between ages 65 and 90 years old. Samples represented under active adults assigned to an intervention or control group, as well as a group of already active individuals. The questionnaire took approximately 10 to 15 min to complete via self-administration. The study demonstrated that the CHAMPS questionnaire had adequate 6-month test-retest reliability, ICC Pearson's r = .63-.65 (Stewart et al., 2001). Also, the scale was sensitive, significantly detecting small to medium meaningful changes in physical activity levels between control and experimental groups (Stewart et al., 2001).

For screening purposes, the CHAMPS was used to assess whether or not participants conducted at least light physical activities on a weekly bases. Light physical activities were considered any physical activities with a MET value over 2.0 (Stewart et al., 2001). This value indicated that the person was expending energy twice above the body at rest (RMR). Participants who <u>did not conduct</u> light, moderate, or vigorous physical activities for at least 1.5 hours a week (or 3 times a week, ½ hr each occasion) were excluded from the study. No participants were screened out of the study because of activity requirements. On average, participants engaged in 6.5 (SD = 2.5, R = 1 – 12) number of physical activities with a MET value $\geq$ 2.0. The most commonly reported physical activities with a MET $\geq$ 2.0 were light housework (90.7%), walk leisurely (67.4%), light gardening (60.5%), stretching or flexibility exercises (48.8%), run errands (44.2%), heavy housework (41.9%), walking fast or briskly (30.2%), general exercises (30.2%), walk uphill (23.3%), ride a bicycle or stationary cycle (23.3%), heavy gardening (20.9%), and water exercises (18.6%). On average, participants reported conducting each of the activities 1- 2.5 hours a week.

Procedure

Use of Palm Pilots© for data collection. Measures of positive and negative affect and physical activity were collected throughout the day on a hand-held computer, or Palm Pilot©. The Palm Pilot© program used in the current study was developed by Barrett and Barrett (2003) and was free to download from the internet (accessed online February, 2003). The program has been successfully run in previous studies on any Palm Pilots© with Palm operating systems between 3.0 and 3.5. As far as personal experience with the program, the investigator and her advisor attended a Radcliff Institute workshop at Harvard University in Spring 2003 to learn how to use Palm Pilots© in experience sampling method (ESM) studies. Lisa Feldman-Barrett presided over the workshop.

The program provided control features that could not be obtained in paper-and-pencil ESM studies. First, the program allowed one to set the start and end time of each study day, as well as the number of total study days. For the purposes of this study, the program was told to beep the participant four times a day at equal intervals in a 12-hour time period. Second, the program did not allow the participant to retrospectively answer questions. Third, response times to each question were recorded. Fourth, one could adjust the number of beeps and the amount of time allocated for the participant to respond to a particular session. The program essentially "took over" the Palm Pilot©, not allowing the participant to use it when an assessment event was not in session. During the non-response time, the Palm Pilot© simply stated it was "sleeping".

The current study used fixed, 4 hr time intervals to collect data. One methodological reason fixed time intervals were used was to prevent missing data. From pilot testing, the study was concerned about the volume level allowed for the Palm Pilot©. Essentially, the volume was lower than what the study would have preferred. Therefore, a fixed time to be paged was advantageous because the participant was more likely to be waiting and have the Palm Pilot© nearby. A second, theoretical reason for why the study used a fixed time schedule was that the study wanted to investigate the cumulative effects of daily affect and physical activity. For instance, did higher levels of total energy expenditure for Monday relate to total energy expenditure for Tuesday? To assess this, participants were asked to report all physical activities since the last 4 hr testing session. If the study used random paging, the study would not have been able to answer its hypotheses.

Studies on daily emotions using the Palm Pilot© method have been successfully tested in college populations (Feldman-Barrett & Barrett, 2001). Considering the current study used Palm Pilots© in an older age group, the investigator pilot tested the study on three community-dwelling older women. Results from the pilot testing found that participants missed very few data sessions (< 5%) and anecdotally stated that they enjoyed doing the study and would not mind doing another study that was similar. It was concluded that the study could be conducted within a sample of older women. To enhance participant knowledge of study procedures, the investigator developed a training session to ensure that all participants fully understood, felt comfortable, and were willing to participate (see Appendix G).

A training procedure took place on an evening before the daily study was to begin. The training procedure, along with baseline measures, took approximately 60 to 90 min. If the participant had not already consented to the study, the investigator and/or trained research assistant would provide an overview of the study and ask the participant to read and sign the informed consent (see Appendix E). This took approximately 5 to 10 min. Second, the participant was given self-report measures of the screening and baseline instruments. Included in this booklet, were instruments to assess physical activity levels, demographics, personality, physical health status, social support, and mental health status. As the participants were answering the baseline measures, the investigator and the research assistant walked around the room and answered any questions. This took about 30 to 40 minutes. Lastly, participants were trained on how to do the daily study. First, the participant was trained on how to use the pedometer. The participant was shown how to wear the pedometer, where and when to record the pedometer reading, and how to reset the pedometer at the start of a new day. In order to ensure the reliability of each pedometer, the participant was given a step test to be sure the steps taken reflected the steps on the pedometer. Participant gait was also assessed in the process of testing pedometers (see Appendix G). The participant was asked to wear the pedometer during all waking hours throughout the study. Pedometer training took about 5 minutes.

Next, the participant was instructed on how to use the Palm Pilot©. Here, the participant was able to go through an example trial. The investigator and research assistants recorded whether or not the participant could hear, see, read, and feel comfortable following the Palm Pilot© procedures. The investigator also instructed participants what to do in case an error was made or a malfunction occurred while testing (see Appendix H). The investigator told the participant that the Palm Pilot© will beep 4 times a day and 4 hours apart. The paging times were the same each day, thus the participant could anticipate when the beep would occur. The participant was asked to carry the Palm Pilot© with her during all waking hours. After Palm Pilot© training, the participant was shown the study measures in the Daily Journal. Lastly, the investigator provided an overview of study protocol that included a “study protocol checklist” to be placed in the participant’s folder. The investigator answered any last questions and told the participant that she would be telephoned to see how the study was going (see Appendix N). If any problems occurred, the participant was told not to hesitate to call the investigator. Palm

Pilot© and Daily Journal training took about 15 minutes. As an incentive, immediately after completing the training session, participants received $10.00 in cash and were told that their names would be entered in a raffle to win one of two Palm Pilots© or one of three pedometers at the conclusion of the study.

Daily Study Procedure. The daily measurement study procedure began on a Monday and ended on Saturday. Thus, there were a total of six test days. The participant was paged at the same times, four times a day (8am, 12am, 4pm, 8pm) until the end of the 6th day of testing. Participants had 15 min to respond to the Palm Pilot© before the testing session expired. Also, participants had 15 min between each presented question item before the session expired. Questions on the Palm Pilot© were related to indicators of affect and physical activity. Time to complete each paged session took no longer than three minutes. Presentation of affect versus physical activity items were counterbalanced across participants (e.g., every other recruited participant had affect displayed before physical activity). In addition to the paged sessions, participants were asked to answer questions in a paper-and-pencil journal at the end of the day. Questions regarding positive and negative social influences, uplifts, hassles, physical symptoms, and the day's events were answered. Within a couple days after the last day of testing (i.e., Saturday), the investigator or research assistant visited the participant, downloaded Palm Pilot© data onto a laptop computer, retrieved daily journal information, and asked about participant thoughts on the study (see Appendix O) and medication information (see Appendix P). Lastly, once a participant completed the study, data from the Palm Pilot© was easily uploaded into a text file from a simple DOS command. Then, data was directly imported into an SPSS data file, therefore preventing potential data entry errors and saving time.

Equipment Issues

Given that the current study used electronic devices to record data, it was important to address what was done to prevent equipment problems, the frequency of problems, and solutions to equipment problems.

Steps Taken to Prevent Equipment Problems. For the Palm Pilots©, new AAA batteries were installed before every participant to prevent equipment shutdown and data loss. To be sure the pedometers were calibrated appropriately, every participant was given a “10-ft” test to verify that the number of steps taken in 10 ft corresponded to the pedometer. Every Palm Pilot© received a practice test with each participant before the study began. If the participant made an error in reporting a response on the Palm Pilot©, she was asked to record her error in an error logbook. This way, the investigator could determine the frequency of entry errors. The research assistant always carried extra Palm Pilots© in the unfortunate event one malfunctioned. If a Palm Pilot © broke down during the study or data was lost after the experiment, the investigator asked if the participant would be willing to start the study on a different week. If the participant did not agree, lost data was attributed to equipment issues. Finally, if the participant experienced any equipment problems, she was asked to call the primary investigator immediately. The primary investigator logged all equipment problems in a journal.

Frequency and Type of Equipment Problems. For the current study, two participants’ data were lost due to equipment malfunction while conducting the study. During the hotsync process to get the data on the computer, a malfunction caused the data to be completely lost. In both circumstances, the participants did not agree to do the study again. Overall, reported entry errors were uncommon. Only five participants reported errors due to touching the wrong button on the Palm Pilot. Each participant reported two errors. Equipment malfunction occurred more frequently than expected. The study lost six Palm Pilots© throughout the course of the study. Each time, the malfunction occurred while the participant was doing the study. Participant reported any of the following problems, (a) picking one answer, and the Palm Pilot© highlighting a different answer for one particular question (n = 1), (b) the Palm Pilot© screen froze and an error on the screen stated "fatal error" (n = 1), (c) the Palm Pilot© did not beep (n = 1), and (d) the Palm Pilot© screen went blank and did not come back up (n = 3). In all circumstances, the participant called the primary investigator who dropped off a replacement Palm Pilot© as soon as possible. No significant data were lost from the aforementioned equipment malfunctions, as the primary investigator was still able to upload data to the computer. However, some missing data were due to equipment malfunction, rather than participant non-adherence. Lastly, throughout the course of the study three pedometers were lost, one pedometer quit functioning, and one pedometer was washed with laundry. In all circumstances, a replacement pedometer was given as soon as possible. Anecdotally, after the study was over, participants often reported that the pedometers were not accurate with their steps throughout the day.

Primary Study Measures

Positive and Negative Affect. Daily positive and negative affect states were measured using the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). This scale included 20 descriptor words, whereby 10 are positive ("inspired") and 10 are negative ("hostile"). Participants were asked to indicate "how you feel right now (that is, at the present moment). Participants rated the descriptor on a 5-point scale (1 = "very slightly or not at all," 2 = "a little," 3 = "moderately," 4 = "quite a bit," and 5 = "extremely"). This scale has been found to have good internal reliability (PA = .86-.90, NA = .84-.87, Watson et al., 1988). When used as a daily measure, Watson (1988) found the measure to have good split-half reliability over one week (PA = .87, NA = .78). For the current study, positive affect and negative affect had good internal reliability using Cronbach's alpha (.92 for positive affect and .75 for negative affect). The PANAS is included in Appendix I.

There were several reasons why the PANAS was chosen over previous used affect scales. First, the PANAS has been reliably tested in several studies that the positive and negative affect scales are distinctly different (Watson, 1988; Watson & Pennebaker, 1989; Watson, et al., 1988). Other measures, such as the Affect Balance Scale (Bradburn, 1969) have a positive and negative scale, however the response categories are dichotomous. Thus, the intensity of the specific affect cannot be determined. Other measures of affect, such as the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1992) do not necessarily break down into positive and negative affect. For instance, the POMS has six subscales, of which only one reflects positive affect states (McNair et al.). Secondly, the PANAS is briefer than the POMS (20 versus 37 items). The PANAS has been reliably tested as a state measure, asking participants to rate the extent to which they feel a certain affect at this moment (Watson, 1988). Lastly, the PANAS has been tested widely among older adult populations in both short-term (Gijsbers van Wijk et al., 1999; see Watson studies) and longitudinal designs (see Baltes & Mayer, 1999). For the aforementioned reasons, the PANAS was the affect measure of choice.

Physical Activity. The current study used a modified version of the Physical Activity Scale (PAS; Aadhal & Jorgensen, 2003). The PAS requires participants to self-report a 12-hr recall of physical activities using nine ordered categories of physical activity that increase in intensity (e.g., sleeping to gardening to running). Each of the nine categories is assigned a MET value. The MET values follow those assigned in the Compendium of Physical Activities as detailed in Ainsworth and colleagues (1993). Upon completion, the investigator can determine the time in and out of physical activity and the type and level of physical activity. Ultimately, the investigator can use this measure to calculate energy expenditure in kcals/12hr. The current study used the exact same directions and nine ordered physical activities in the PAS, however, participants were asked to report physical activity over the previous 4 hrs rather than 12 hrs (see Appendix J). Daily mean energy expenditure for the study sample was 1757.69 kcals/16 hr (SD = 470.56 kcals/16hr, R = 914.79 – 2848.71). Currently in the literature, there are no standardized mean levels of daily energy expenditure for community-dwelling older women. However, when investigating the number of women who were following USDHHS' (1996) recommendations for conducting moderate levels of physical activity on most days of the week, the study found large discrepancies. For instance, the USDHHS stated that 22% of adults over age 45 follow recommendations, whereas the current study found that 59% of the adults followed recommendations using the PAS. However, results are in line with the USDHHS (1996) report that 65% of older adults report being physically activity during leisure time.

The PAS was chosen for several reasons. First, it provided an account of activity and inactivity over a period of time (e.g., sleeping, resting). Second, it has concurrent validity with daily diary reports of physical activity (Aadhal and Jorgensen, 2003). Third, the PAS has been shown to reliably predict physical activity among adults of all ages (Aadhal and Jorgensen). Lastly, this measure was also chosen over other physical activity measures (e.g., CHAMPS), because it did not necessarily lead the participant to believe that the study was investigating the relationship between affect and "exercise," but simply investigating the daily lives of older women. For instance, both the CHAMPS and the Physical Activity Scale for Elderly (PASE; Washburn, 1999) ask about specific exercise behaviors, such as stretching, balancing, etc.

A second, observable measure of physical activity, the number of steps using a pedometer, was used to assess the concurrent validity of the study's primary physical activity measure. A recent literature review found pedometers to predict physical activity reliably in steps in both laboratory and free-living environments (Tudor-Locke et al., 2002). In a review of pedometer-producing companies, Tudor-Locke found that Yamax pedometers made in Japan were the most reliable pedometers. Thus, the current study used Yamax pedometers (Digiwalker SW200) in the current study. Lastly, a recent study also found that pedometers were just as reliable as accelerometers and more cost efficient (Le Masurier & Tudor-Locke, 2003). It was expected that physical activity as measured by kcals and number of steps taken on the pedometer would be significantly, moderately correlated to provide convergent validity for the PAS as a valid measure of physical activity among older women. Results found number of steps and kcals calculated from the PAS to be significantly positively related over the course of the study ($r = .187$, $p = .00$). Number of steps and energy expenditure were also significantly positively related when collapsed across six study days for time of day ($r = .270$, $p = 00$) and collapsed across four times of day for study day (.198, $p = .00$).

Secondary Study Measures.

The current study collected additional information on participants' background information, as well as a daily journal regarding daily social interactions, stress, and physical symptoms. Important secondary measures used in the current study's analyses will be presented. Table 41 presents the means and standard deviations for the aforementioned measures. Bivariate correlations among the measures can be found in Table 45.

Daily Hassles and Uplifts Scale (DeLongis, Folkman, & Lazarus, 1988) is a self-report questionnaire that asks participants to endorse 53 daily stressors (e.g., family, weather, job, money, etc.). The participant is asked to indicate the extent to which each item was ‘Not at All’ (0) to a ‘Great Deal’ (3) of a Hassle and/or an Uplift for the current day. The potential range of both the Hassles and Uplift scale is from 0 – 156. Research has shown that daily uplifts and hassles are related to daily affect and physical symptoms in adults (Delongis, et al., 1988). For the current study, both the Hassles and Uplifts scale had adequate internal reliability (Chronbach’s α = .86, .90, respectively). The overall mean number of daily Hassles was 10.70 (*R* = 0 – 46; *SD* = 10.76). The overall mean number of daily Uplifts was 31.29 (*R* = 0 – 101; *SD* = 18.48).

Rook (2001) developed and validated a 20-item daily positive and negative social interactions scale in an older adult sample. This measure asks participants to endorse ‘yes’ (1) or ‘no’ (0) as to whether they had any of 13 positive social interactions or 7 negative interactions over the course of the study day. Thus, the potential range on the positive social interactions was 0 to 13 and 0 to 7 for negative interactions. Internal reliability for the social interactions scale was low (positive α = .60, negative α = .61). Mean positive social interactions was 5.55 (*R* = 0 – 17; *SD* = 2.56) and 0.35 for negative daily interactions (*R* = 0 – 4; *SD* = 0.78). However, it should be noted that Rook’s study used the scale for 14 consecutive days, while the current study used the scale for six days.

Pennebaker’s (1982) Inventory of Limbic Languidness (PILL) was the measure used in the current study to assess daily physical symptom reporting. The PILL is a 54-item daily checklist of physical symptom complaints. This measure has been validated large adult samples (Pennebaker; Watson & Pennebaker, 1989). The physical symptom measure asked participants to endorse ‘yes’ (1) or ‘no’ (0) as to whether they had any of 54 physical symptoms over the course of the study day. Therefore the potential response range for the PILL was 0 to 54. Internal reliability for overall mean daily physical symptoms was good (Chronbach's α = .88). The mean number of daily physical symptoms was 5.93 (*R* = 0 – 34, *SD* = 6.05).

Chapter 4: Results

Guidelines for Missing Data

First, individual daily data were checked for missing data. In the current study, the potential for multiple kinds of missing data existed. Thus, diagnostics were implemented to determine the nature of missingness. In order to calculate individual daily means and standard deviations on study measures, a minimum of three of the four data points per measurement per day were required. For example, if a single item were missing from a single positive affect assessment, a single missing response could be replaced by an imputed value or the use of mean item scores. However, if an entire scale was missing at a singe point of measurement in the day, missing scale values for the time of day in which the scale was missing were imputed. Analyses were then conducted to determine whether significant differences in study results existed due to imputed scale means. Brennen and Mroczek (2002) have found that imputing data in this manner with this type of study design is acceptable. Individual data analyses (i.e., regression curve estimations) were conducted on individuals with missing data and then again with their imputed scale means. Imputing scale means for missing time points did not significantly change the results in any individually-run data analyses.

Whether a given participant's data were included in the data analyses was determined by several a priori data completeness rules. For instance, no more than one time of measurement per day could be missing. If a time of measurement was missing, data were imputed and checked. In addition, the investigator examined whether there were important differences between those women who had missing times of measurement and those who completed all times of measurement on study measures.

Missing Data Results. No single question items were missed in any testing sessions. The few missing measure items were likely due to the minimal time required to answer questions in each study session (< 3 min). However, about half of study participants reported missing at least one testing session (n = 20, 46.5%). Of the 20 participants, three participants did not meet aforementioned study guidelines on missing data and thus were dropped from the study. Two of the three participants reported missing data due to sleeping and not hearing the Palm Pilot© page. The remaining participant did not report any knowledge of missing data sessions. Of the remaining 17 participants with missing data, the average number of times a session was missed was 1.82 (*SD* = .95, *R* = 1 – 4). The principal investigator looked at participants' daily journals for reports of reasons why test sessions were missed. Of the 17 participants with missing data, the majority of participants reported knowledge of missing data (n = 12). Reasons for missing data points included (a) just missed it (n = 3), (b) did not hear due to sleeping or palm in a different room (n = 4), (c) on the phone (n = 2), (d) traveling (n = 1), (e) visiting family and forgot to bring Palm Pilot© (n = 1), and (f) Palm Pilot© malfunction, did not get a new one before next test session (n = 1) .

Results from a one-way analysis of variance found that individuals who had missed one or more acceptable times of measurement were no different from individuals who did not miss any times of measurement on positive affect ($F(1, 886) = 1.89$, $p = .17$) or energy expenditure ($F(1, 886) = 1.430$, $p = .23$). However, individuals who were missing at least one time of measurement were more likely to experience higher levels of negative affect ($M = 11.97$, $SD = 2.76$) than individuals who did not miss any points of measurement ($M = 11.38$, $SD = 3.43$; $F(1, 886) = 7.55$, $p = .01$). However, it should be noted that overall, mean levels of negative affect were low (i.e., the possible range for negative affect was 0 – 50). Finally, individuals who missed at least one point of measurement were compared to individuals who did not miss any measurements on participant descriptive demographic and health information (i.e., age, living status, marital status, education, income, BMI, medical conditions, prescribed medications, grip strength, and blood pressure). Age was the only variable in which significant differences were observed; women who missed at least one point of measurement were significantly older (*M* = 73.88, *SD* = 9.58) than women who missed no points of measurement (*M* = 68.00, *SD* = 7.64; $F(1, 35) = 4.31$, $p = .045$).

Counterbalancing. Although the hand-held computer program used in the study did not allow for counterbalancing of affect and physical activity measures for each study session, the study counterbalanced presentation of measures across participants. Thus, every other study participant viewed either affect or physical activity questions first for each study session. Results from a one-way analysis of variance found that presentation order of study measures did not have a significant effect on positive affect ($F(1, 886) = 2.160$, $p = .14$), negative affect ($F(1,886) = .077$, $p = .782$), or physical activity ($F(1, 886) = .056$, $p = .813$) reporting.

Results of Primary Hypotheses

Descriptives. The study included 42 participants. Two participants were excluded due to equipment malfunction and complete loss of data. Three participants were excluded because they did not meet missing data requirements. The final sample was 37 participants. In order to answer part of the primary hypotheses regarding the relations among positive affect, negative affect, and physical activity; means, standard deviations among study measures were calculated for the individual for every point of measurement (4 time points x 6 days = 24). This descriptive information is presented in Appendix Q. The tables also present individual bivariate correlations among study variables. It should be noted, however, that for within-individual bivariate correlations, there were only 24 data points (4 data points x 6 days) for each measure. Thus, it was unlikely that there would be a significant correlation between positive affect and physical activity. However, it was expected that the correlation would be in a positive direction. A tally of individuals' correlations found that 76% (n = 28) of the study sample had a positive relation between positive affect and physical activity, however only 22% held a statistically significant relation. Fifty-four percent (n = 20) held a negative relation for negative affect and physical activity, however, none of these relations were statistically significant.

The aforementioned tables do not include imputed means. However, when running individual regression curve estimates with and without imputed scale means, results found there were no differences in results. Therefore, all further individual analyses were conducted with individually imputed means. Finally, Appendix R presents individual-level means and standard deviations on study variables for study day (collapsed across four within-day time assessments). Appendix S presents individual-level means and standard deviations on study variables for time of day (collapsed across six study days).

Primary Hypotheses Results

Individual Level Analyses. To further investigate the first and second primary hypotheses regarding the positive relations affect and physical activity (as measured by kcals over 4 hr), regression curve estimation analyses for each participant were calculated. Regression curve estimations tested the null hypotheses that at the individual-level, (a) positive affect and physical activity were not significantly related over the course of the study and (b) negative affect and physical activity were not significantly related over the course of the study. If the null hypotheses were rejected, then further analysis of curve estimation results would determine whether the relations among study variables were best described as a linear, quadratic, or cubic trend.

Thirty-seven individual regression curve estimations were conducted to test the relations among positive affect and physical activity over time. All 24 points of measurement were included in the individual analyses. Results found that 13 of the 37 participants (35%) had a significant relation between positive affect and physical activity over the study period. Tables 4 - 16 represent the results from the statistically significant curve estimations. Due to the large number of analyses, a summary of the findings is presented. The magnitude of the relation between positive affect and physical activity over the course of the study ranged from R^2 = .163 to .664 (M R^2 = .323). As shown in the regression curve estimation tables, linear and quadratic functions were found to be statistically significant. In all individual level regression curve estimation analyses, if all functions were statistically significant, the most complex function that offered statistically significant unique contribution as determined by individual t-tests was considered. Figure 1 and 2 represent graphical data of the individual growth curves calculated in the study. Ten of the 13 participants' relations among positive affect and physical activity were best described by a linear function in the positive direction. Three of the 13 participants' relations among positive affect and physical activity were best described by a quadratic function. Positive affect and physical activity held a positive relation in the first half of the week and a negative relation in the second half of the week.

Thirty-seven individual regression curve estimations were conducted to test the relations among negative affect and physical activity over time. All 24 points of measurement were included in the individual analyses. Results found that five of the 37 participants (13.5%) had a significant relation between negative affect and physical activity over the study period. Tables 17 - 21 represent the results from the statistically significant curve estimations. The magnitude of the relation between negative affect and physical activity over the course of the study ranged from R^2 = .267 to .543 (M R^2 = .393). Two of the five participants' relations among negative affect and physical activity were best described by a linear function. Both participants had an unexpected, significant positive relation among negative affect and physical activity. The remaining three participants' relations among negative affect and physical activity were best described by a quadratic function. For these participants, negative affect and physical activity levels held a positive relation at the beginning of the week and a negative relation in the second half of the week.

To investigate the third and fourth primary hypotheses regarding relations among intraindividual daily fluctuations in affect and physical activity (as measured by kcals/4hr), regression curve estimations were used. However, for this analysis, z-scores were calculated for each individual's positive affect, negative affect, and physical activity score. The z-score represented each individuals own deviation from the daily mean on the specified measure.

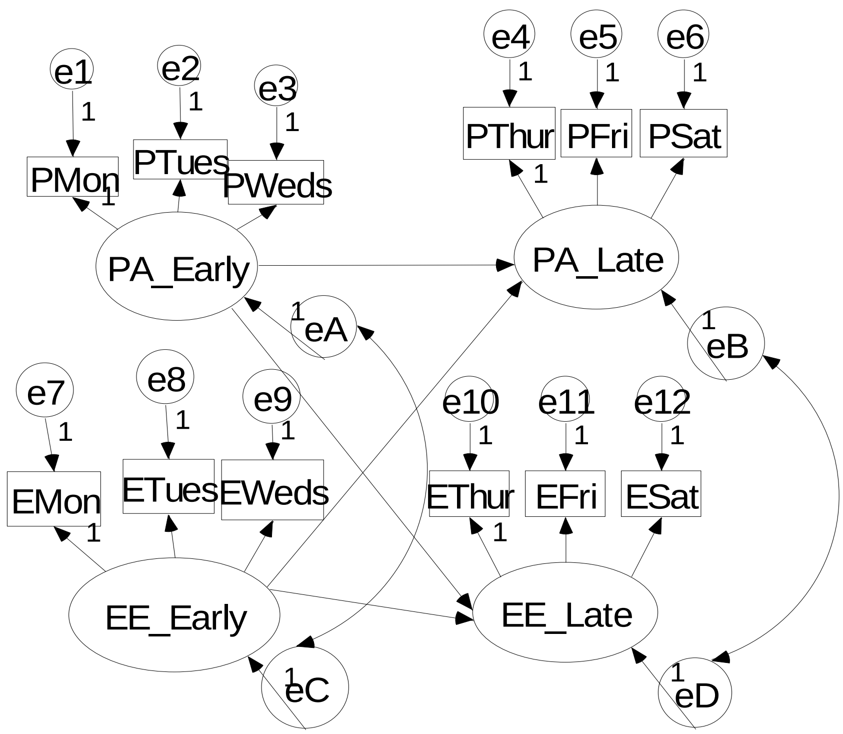
Thirty-seven individual regression curve estimations were conducted to test the relations among daily fluctuations in positive affect and physical activity over time. Results found that 13 of the 37 participants (35%) had a significant relation between fluctuations in positive affect and physical activity over the study period. Tables 22 - 34 represent the results from the statistically significant curve estimations. Due to the large number of analyses, a summary of the findings is presented. The magnitude of the relation between fluctuations in positive affect and physical activity over the course of the study ranged from R^2 = .172 to .553 (M R^2 = .340). Five of the 13 participants' relations among fluctuations in positive affect and physical activity were best described by a linear function in the positive direction. Eight of the 13 participants' relations among fluctuations positive affect and physical activity were best described by a quadratic function. For these participants, there was a positive relation between fluctuations in positive affect and physical activity in the first half of the week and a negative relation in the second half of the week.

Thirty-seven individual regression curve estimations were conducted to test the relations among variability in negative affect and physical activity over time. Results found that four of the 37 participants (10.8%) had a significant relation between fluctuations in negative affect and physical activity over the study period. Tables 35 - 38 represent the statistically significant results from the regression curve estimation analyses. The magnitude of the relation between positive affect and physical activity over the course of the study ranged from R^2 = .186 to .353 (M R^2 = .280). Two the four participants' relations among fluctuations in positive affect and physical activity were best described by a linear function. One participant displayed a negative relation among fluctuations in negative affect and physical activity, while the other participant held a significant positive relation between the two study variables. The remaining two participants' relations among daily fluctuations in negative affect and physical activity were best described by a quadratic function. For these participants, fluctuations in positive affect and physical activity held a negative relation in the first half of the week and a positive relation in the second half of the week.

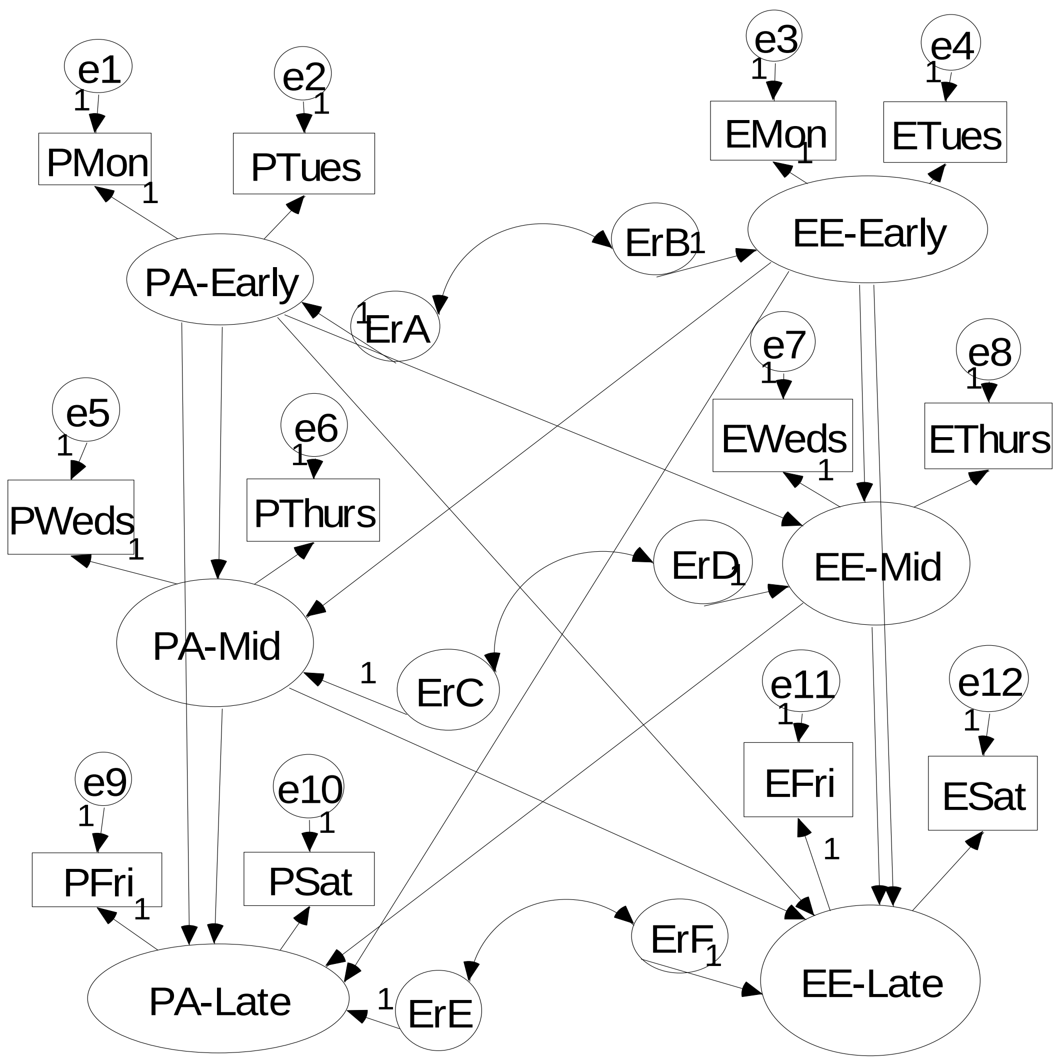
Group Level Analyses. To address the fifth and six hypotheses, path analyses were conducted using structural equation modeling (SEM; see Maruyama, 1998 for review). Specifically, a path model was used to test the null hypothesis that affect and physical activity (as measured by daily kcals) at the group level held an asynchronous relation over the course of the study. If the null hypothesis was rejected, the study could conclude that (a) the data was a good fit to the path model and (b) positive and negative affect held a synchronous relation with physical activity over the study period.

Two analyses were conducted for each model; one for positive affect and one for negative affect. Due to power constraints, measures were collapsed across days to test the following models; (a) Early (Monday-Wednesday) and Late (Thursday-Saturday) and (b) Early (Monday-Tuesday), Mid (Wednesday-Thursday), and Late (Friday-Saturday).

Model 1: Early – Late week Relations Between Positive Affect (or Negative Affect) and Energy Expenditure



Model 2. Early-Mid-Late Week Relations Between Positive Affect (PA) (or Negative Affect) and Physical Activity (EE)



The Analysis of Moment Structures (AMOS) was used to test whether or not the data fit the path models shown above (Arbuckle, 1995). AMOS uses variance-covariance matrices to estimate path models. For each path the critical ratio tests the maximum likelihood estimate (MLE) for statistical significance (Arbuckle). Critical ratio values above 1.96 are statistically significant at the $p < .05$ level (Arbuckle), thus indicating a good fit of the data for the specified path to the model. To assess whether the data produced a good fit with the overall model, many indices of fit were used. Arbuckle suggested the following criteria for fit indices should be met to conclude a good fit of the data to the model; (a) an overall Chi-square value in which non-significant differences denotes a good fit, (b) a value greater than .90 for the comparative fit index (CFI) and the Tucker-Lewis index (TLI) denotes a good fit, and (c) the root mean square error approximation (RMSEA) which considers degrees of freedom. RMSEA values less than 0.08 denote an adequate fit of the data and RMSEA values less than 0.05 denote a close fit of the data to the model.

Standardized and unstandardized regression weights and the critical ratio values associated with the Early-Late path model for positive affect and physical activity are shown in Table 46. All paths were tested simultaneously. Model fit indices suggested an adequate fit of the data to the model [χ^2 = (DF = 48, N = 37) = 62.70, p = .08; CFI = 0.959; TLI = 0.944; RMSEA = 0.09]. Results indicated that the path from early to late positive affect was significant. As indicated by the regression weights, there was a significant, positive relation between early and late week positive affect. Results indicated that the path from early to late physical activity was significant. As indicated by the regression weights, there was a significant, positive relation between early and late week physical activity. The path from early positive affect to late physical activity or the path from early physical activity to late positive affect was not statistically significant.

Standardized and unstandardized regression weights and the critical ratio values associated with the Early-Late path model for negative affect and physical activity are shown in Table 47. All paths were tested simultaneously. Model fit indices suggested an inadequate fit of the data to the model [χ^2 = (DF = 48, N = 37) = 58.77, p = .14; CFI = 0.935; TLI = 0.911; RMSEA = 0.08]. Results indicated that the path from early to late negative affect was not significant. The path from early negative affect to late physical activity or the path from early physical activity to late negative affect was not statistically significant.

Standardized and unstandardized regression weights and the critical ratio values associated with the Early-Mid-Late path model for positive affect and physical activity are shown in Table 48. All paths were tested simultaneously. Model fit indices suggested an adequate fit of the data to the model [χ^2 = (DF = 39, N = 37) = 51.89, p = .08; CFI = 0.964; TLI = 0.939; RMSEA = 0.096]. Results indicated that only two paths were statistically significant; (a) early positive affect significantly predicted mid-week positive affect and (b) early physical activity significantly predicted mid-week physical activity. Both of these paths showed positive relation among paths.

Standardized and unstandardized regression weights and the critical ratio values associated with the Early-Mid-Late path model for negative affect and physical are shown in Table 49. All paths were tested simultaneously. Model fit indices suggested an adequate fit of the data to the model [χ^2 = (DF = 39, N = 37) = 43.48, p = .29; CFI = 0.973; TLI = 0.954; RMSEA = 0.06]. Results indicated that three paths were statistically significant; (a) mid-week negative affect significantly predicted late week negative affect and (b) early physical activity significantly predicted mid-week physical activity, and (c) early week physical activity predicted mid-week physical activity. The first two paths found a positive relation among paths. However, the relation between early week negative affect and mid-week physical activity was negative. Thus higher levels of negative affect on Monday and Tuesday predicted lower levels of physical activity on Wednesday and Thursday.

To further investigate the relations among affect and energy expenditure, the study used the General Linear Model in SPSS 11.0 to conduct a 6 (day) x 4 (time) within-subjects repeated measures analysis on positive affect, negative affect, and physical activity. This analysis tested the null hypothesis that participants in the study sample did not have a significant within-subject time and/or day differences in positive affect, negative affect, and energy expenditure. If the analysis rejected the null hypothesis, results would determine whether positive affect, negative affect, or physical activity levels differed by time of day and/or study day. Additionally, results would determine whether the relation of affect and physical activity to time of day and study day were best described by a linear, quadratic, or cubic trend. Thus, this analysis presents another method of looking at within-individual trends in affect and physical activity. This analysis would also help determine if participants are following similar within and between day trends in affect and physical activity.

Tables 39 and 40 present the means and standard deviations at the group level for study day and time of day, respectively. Tables 43 and 44 present bivariate correlation among study variables by study day and by time of day, repsectively. Multivariate results for within-subject effects found that dependent measures significantly varied by time of day ($\lambda = .500$; $F(9, 258) = 9.44$, $p = .00$). Study variables did not significantly vary by study day ($\lambda = .894$; $F(15, 491.78) = 1.36$, $p = .16$) or time of day x study day ($\lambda = .914$; $F(45, 1599.04) = 1.09$, $p = .32$).

At the multivariate level, tests of significance must be concerned with the issue of sphericity. Sphericity is a potential problem in repeated measures designs, because the covariance error matrix might not be equal. Mauchly's test of sphericity is provided in SPSS 11.0. This analysis tests the null hypothesis that the error covariance matrix is equal, or sphericity is assumed. If the null hypothesis is rejected, Howell (1995) suggests that degrees of freedom to be adjusted to produce a more conservative test of statistical significance. Thus, the more conservative Greenhouse-Geisser adjusted degrees of freedom will be used to investigate univariate tests of significance in a repeated measures analysis (Howell). It is also important to consider the large number of significance tests to be conducted in the current study's entire results section. Large numbers of analyses could increase the chance of Type I error, or rejecting the null hypothesis when it is true. Due to the large number of significance testing and potential for increased error, the critical alpha level for remaining analyses was set at $p < .01$.

Mauchly's test for sphericity at the univariate level comparing all potential relations among study variables was statistically significant. Thus, Greenhouse-Geisser estimates were used when determining univariate tests of statistical significance. At the univariate level, results found that positive affect and physical activity significantly varied by time of day ($F(1.97, 70.96) = 9.245$, $p = .00$; $F(2.55, 91.96) = 27.79$, $p = .00$, respectively). Negative affect did not significantly vary by time of day ($F(3, 16.47) = 3.05$, $p = .05$). Figures 3 – 5 displays the relation of study day with measures of positive affect, negative affect, and physical activity.

Within-subjects contrasts were next investigated. Time of day's relation to positive affect was best described by a cubic function ($F(1, 36) = 13.10$, $p = .00$). A figure depicting time's relation with positive affect is shown in Figure 6. In words, participants started the day with low levels of positive affect, had a large increase in positive affect by 1200 hr, and a steady decrease in positive affect from 1200 hr until 2000 hr. Negative affect's relation with time of day is displayed in Figure 7.

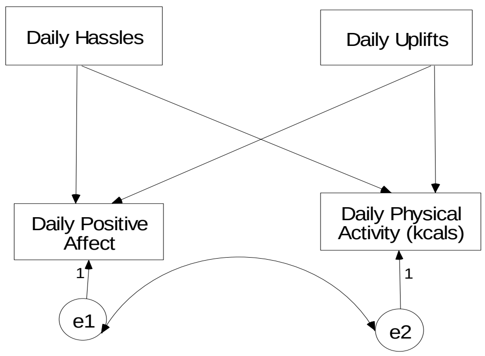
Time of day's relation to physical activity was also best described by a cubic function ($F(1, 36) = 8.08$, $p = .01$). A figure depicting time's relation with physical activity is depicted in Figure 8. In words, participants started the day with low levels of physical activity, an increase in physical activity by 1200 hr, and a decrease in physical activity from 1200 hr until 2000 hr.

Secondary and Exploratory Analyses

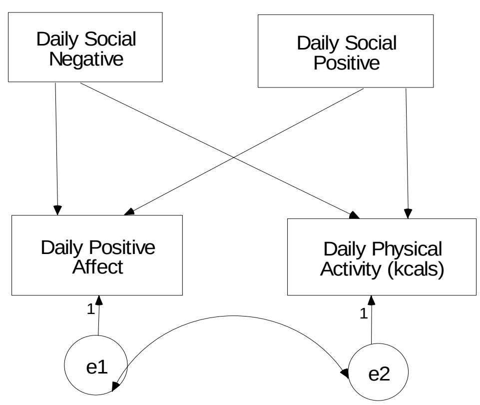
Path analyses were conducted using AMOS to address group level exploratory hypotheses regarding the relation between affect and physical activity when third variables that fluctuate on a daily basis were investigated (i.e., temperature, social interactions, stressors, and physical symptoms). Due to limited power, a reliability analysis was conducted on all study variables included in the path analyses. The reliability analysis tested whether scores on the variables were reliable across days (i.e., Monday – Saturday) for all participants. With the exception of daily negative social interactions, results found good internal reliability for all study measures across the six study days; daily positive affect ($\alpha = .97$), negative affect ($\alpha = .72$), physical activity ($\alpha = .84$), daily positive social interactions ($\alpha = .83$), daily negative social interactions ($\alpha = .60$), daily uplifts ($\alpha = .96$), daily hassles ($\alpha = .95$), daily temperature ($\alpha = .94$), and daily physical symptoms ($\alpha = .98$).

Next, the following models tested whether or not the paths to positive affect (or negative affect) and physical activity would be significant when the positive affect and physical activity covaried.

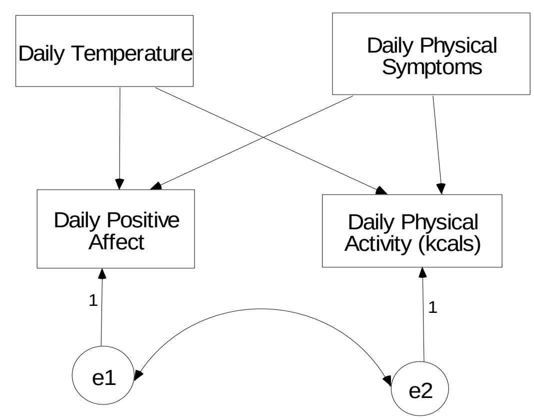
Exploratory Model 1. Relations between Daily Stressors and Positive Affect (or Negative Affect) and Physical Activity



Exploratory Model . Relations between Daily Social Interactions and Positive Affect (or Negative Affect) and Physical Activity



Exploratory Model . Relations among Daily Temperature and Physical Symptoms and Positive Affect (or Negative Affect) and Physical Activity



Standardized and unstandardized regression weights and the critical ratio values associated with the Exploratory Model 1 path model for daily stressors paths for daily positive affect and physical activity are shown in Table 50. All paths were tested simultaneously. Model fit indices suggested a good fit of the data to the model [χ^2 = (DF = 1, N = 37) = 0.616, p = .43; CFI = 1.00; TLI = 1.15; RMSEA = 0.00]. Results indicated that the path from daily hassles to positive affect was significant. As indicated by the regression weights, there was a significant, negative relation between early and late week positive affect. Thus, higher daily levels of hassles were significantly associated with lower daily levels of positive affect. Results indicated that the path from daily hassles to physical activity was significant. As indicated by the regression weights, there was a significant, positive relation between daily hassles and physical activity.

Thus, higher daily levels of hassles were significantly related to higher daily levels of physical activity. No significant paths were found for daily uplifts and positive affect and physical activity.

Standardized and unstandardized regression weights and the critical ratio values associated with the Exploratory Model 1 path model for daily stressors paths for daily negative affect and physical activity are shown in Table 51. All paths were tested simultaneously. Model fit indices suggested a good fit of the data to the model [χ^2 = (DF = 1, N = 37) = 0.616, p = .43; CFI = 1.00; TLI = 1.17; RMSEA = 0.00]. In addition to previous relations between hassles and physical activity, the results from the current model indicated that the path from daily hassles to negative affect was statistically significant. As indicated by the regression weights, there was a significant, positive relation between daily hassles and daily negative affect. Thus, higher daily levels of hassles were significantly associated with higher daily levels of negative affect. No significant paths were found for daily uplifts and negative affect.

Standardized and unstandardized regression weights and the critical ratio values associated with the Exploratory Model 2 path model for daily social interaction paths for daily positive affect and physical activity are shown in Table 52. All paths were tested simultaneously. Model fit indices suggested an inadequate fit of the data to the model [χ^2 = (DF = 1, N = 37) = 2.97, p = .09; CFI = 0.742; TLI = -0.549; RMSEA = 0.234]. Thus, additional analysis of the data would be inappropriate. Standardized and unstandardized regression weights and the critical ratio values associated with the Exploratory Model 2 path model for daily social interaction paths for daily negative affect and physical activity are shown in Table 53. All paths were tested simultaneously. Model fit indices suggested an inadequate fit of the data to the model [χ^2 = (DF

= 1, N = 37) = 2.97, p = .09; CFI = 0.821; TLI = -0.075; RMSEA = 0.234]. Thus, further analysis of the data was not conducted.

Standardized and unstandardized regression weights and the critical ratio values associated with the Exploratory Model 3 path model for daily temperature and physical symptom paths for daily positive affect and physical activity are shown in Table 54. All paths were tested simultaneously. Model fit indices suggested a good fit of the data to the model [χ^2 = (DF = 1, N = 37) = 0.457, *p* = .50; CFI = 1.00; TLI = 1.394; RMSEA = 0.00]. Results indicated that the path from daily temperature to physical activity was significant. As indicated by the regression weights, there was a significant, positive relation between temperature and physical activity. Thus, higher daily temperature was significantly associated with higher daily levels of physical activity. Results indicated that the paths from daily physical symptoms to daily positive affect and daily physical activity to be statistically significant. As indicated by the regression weights, there was a significant, negative relation between daily physical symptoms and positive affect. Thus, higher levels of physical symptoms were associated with lower levels of positive affect. As indicated by the regression weights, there was a significant, positive relation between daily physical symptoms and physical activity. Thus, higher levels of physical symptoms were associated with higher levels of physical activity. No significant paths were found for daily temperature and positive affect.

Standardized and unstandardized regression weights and the critical ratio values associated with the Exploratory Model 1 path model for daily temperature and physical symptom paths for daily negative affect and physical activity are shown in Table 55. All paths were tested simultaneously. Model fit indices suggested a good fit of the data to the model [χ^2 = (DF = 1, N = 37) = 0.457, *p* = .50; CFI = 1.00; TLI = 1.309; RMSEA = 0.00]. Results indicated that the paths from daily temperature to negative affect and physical activity were significant. As indicated by the regression weights, there was a significant, negative relation between temperature and negative affect. Thus, higher daily temperature was significantly associated with lower daily levels of negative affect. As indicated by the regression weights, there was a significant, positive relation between daily temperature and physical activity. Results indicated that the path from daily physical symptoms to daily physical activity to be statistically significant. As indicated by the regression weights, there was a significant, positive relation between daily physical symptoms and physical activity. No significant paths were found for daily physical symptoms and negative affect.

To examine exploratory hypotheses regarding potential individual differences in intraindividual variability for affect and physical activity, a median split was conducted for each variable. Participant were categorized (not mutually exclusive) as more (1) or less (2) stable on the study variables. Then, three repeated measures MANOVAs were conducted, one for each study variable. The between subjects factor was stability on the variable and the within factors were time and day. The dependent variables were positive affect, negative affect, and energy expenditure. Thus a 2 x (4 x 6) repeated measures MANOVA was conducted. The multivariate analyses tested the null hypotheses that individuals who were more stable in positive affect, negative affect, and energy expenditure throughout the study were no different than individuals who were less stable in positive affect, negative affect, and energy expenditure on dependent measures of positive affect, negative affect and energy expenditure. The analyses also tested the null hypothesis that if there were differences in stability on dependent measures, that differences in stability on dependent measures did not significantly differ by study day (Monday –

Saturday), and time of day (800, 1200, 1600, and 2000 hr) on dependent variable measures of positive affect, negative affect, and physical activity.

Stability in Positive Affect. For positive affect, the mean standard deviation median split occurred at 4.77 (R_{meanSD} = 1.71 – 11.43, M_{meanSD} = 4.90). Multivariate between-subject results found that stability in positive affect did not have a significant relation with the dependent measures (λ = .891, $F(3, 33)$ = 1.34, p = .28). Multivariate results for within-subject effects found that stability in positive affect did have a significant relation with time of day on dependent measures (λ = .267; $F(9, 27)$ = 8.24, p = .00). Multivariate tests of the relation between stability in positive affect and study day were not statistically significant (λ = .609; $F(15, 21)$ = .899, p = .58).

Mauchly's test for sphericity at the univariate level comparing all potential relations among study variables was statistically significant. Thus, Greenhouse-Geisser estimates were used when determining univariate tests of statistical significance. Due to the large number of significance testing and potential for increased error, the critical alpha level for remaining analyses was set at $p < .01$.

Univariate follow-up tests on the significant relation between stability in positive affect and time of day on dependent measures found that the relation was significant for positive affect ($F(2.11, 73.91)$ = 5.07, p = .01). No significant relations were found for physical activity ($F(2.51, 87.99)$ = 3.05, p = .04) and negative affect (F(2.36, 82.54) = .678, p = .53).

Within-subjects contrasts were next investigated. The relation between stability in positive affect and time of day for positive affect was best described by a linear function (F(1, 35) = 7.97, p = .01). More stable positive affect individuals began and ended their day at similar mean levels of positive affect (*M* positive affect Time 1 – 4; 25.55, 26.93, 25.92, 25.14, respectively). However, less stable positive affect individuals began their day with a lower mean level of positive affect than more stable individuals (M = 24.40) and sharply increased their mean levels of positive affect by 1200 hr (M = 29.38) and they remained high for the rest of the day (Ms = 28.41, 27.81, respectively). Overall, less stable individuals had higher levels of positive affect throughout the day than more stable individuals.

Stability in Negative Affect. For negative affect, the mean standard deviation median split occurred at 1.72 (R_{meanSD} = 0 – 10.36, M_{meanSD} = 2.17). Multivariate between-subject results found that stability in negative affect had a significant relation with the dependent measures (λ = .470, *F*(3, 33) = 12.39, *p* = .00). Between-subjects follow-up tests found that stability in negative affect differed on dependent measures of negative affect (*F*(1, 35) = 37.84, *p* = .00). Specifically, individuals less stable in negative affect had lower mean levels of negative affect (*M* = 25.55, *SD* = 1.73) than individuals who were more stable in negative affect (*M* = 27.73, *SD* = 1.69). Stability in negative affect did differ on dependent measures of positive affect (*F*(1,35) = .811, *p* =.37) and physical activity (*F*(1,35) = .062, *p* = .81).

Multivariate results for within-subject tests found that stability in negative affect did not have a significant relation with time of day (λ = .76; *F*(9,27) = .958, *p* = .49) or study day (λ = .71; *F*(15, 21) = .58, *p* = .86) on dependent measures.

Stability in Physical Activity. For physical activity, the mean standard deviation median split occurred at 182.52 kcals (R_{meanSD} = 54.43 – 544.65, M_{meanSD} = 205.05). Multivariate between-subject results found that stability in physical activity had a significant relation with the dependent measures (λ = .52, *F*(3, 33) = 10.27, *p* = .00). Between-subjects follow-up tests found that stability in physical activity had a significant relation with dependent measures of physical activity (*F*(1, 35) = 21.62, *p* = .00). Specifically, individuals less stable in physical activity had higher mean levels of physical activity (*M* = 517.63, *SD* = 22.22) than individuals who were more stable in energy expenditure (*M* = 373.44, *SD* = 21.63). Stability in physical activity did not have a significant relation with dependent measures of positive affect ($F(1,35) = 1.41$, p =.29) or negative affect ($F(1,35) = 2.37$, $p = .55$).

Multivariate results for within-subject tests found that stability in physical activity had a significant relation with dependent measures ($\lambda = .42$; $F(9, 27) = 4.10$, $p = .00$). Multivariate tests did not find a significant relation between stability in physical activity and study day ($\lambda = .75$, $F(15, 21) = .47$, $p = .93$). However, stability in physical activity had a significant relation with time of day ($\lambda = .162$; $F(9, 27) = 15.50$, $p = .00$).

Mauchly's test for sphericity at the univariate level comparing all potential relations among study variables was statistically significant. Thus, Greenhouse-Geisser estimates were used when determining univariate tests of statistical significance. Due to the large number of significance testing and potential for increased error, the critical alpha level for remaining analyses was set at $p < .01$.

Univariate follow-up tests found a significant relation between stability in physical activity and time of day on the dependent variable, physical activity ($F(2.56, 89.72) = 8.18$, p = .00). No significant relations were found for dependent measures of positive affect (F(1.92, 67.08) = .96, $p = .39$) and negative affect (F(2.33, 81.38,) = .22, $p = .84$).

Within-subjects contrasts were next investigated. The relation between stability in physical activity and time of day on physical activity was best described by a quadratic function ($F(1, 35) = 11.15$, $p = .00$). More stable physically active individuals began their day with low levels of physical activity (*M* = 307.92), increased physical activity levels by 1200 hr (*M* =434.17) and steadily decreased in physical activity by 1600 hr (*M* = 385.31) and 2000 (*M* =

366.37). Less stable physical activity individuals followed the same daily pattern as more stable individuals, however less stable individuals had much higher levels of physical activity throughout the day (Ms = 326.10, 612.63, 615.93, 515.87, respectively).

Individual Differences in Surgeon General Recommendations. To examine exploratory hypothesis four regarding individual differences in Surgeon Generals physical activity recommendations relations to dependent study measures, the investigator had to determine whether or not participants were meeting the USDHHS (1996). According to the USDHHS, adults should conduct moderate to vigorous levels of physical activity for at least 30 min at least five days a week. Thus the current study determined whether or not participants were following moderate levels of physical activity by using Stewart and colleagues' (2001) definition of moderate levels of physical activity for older adults. According to Stewart and colleagues, moderate levels of physical activity for older adults are those physical activities that represent a MET value of 3.0 or higher. The current study used this definition to determine how many older women conducted at least 30 min of physical activity with a MET value of 3.0 or higher at least four out of the six study days. Women who met the aforementioned recommendations were categorized with a '1' (n = 22). Women who did not meet recommendations were categorized as a '2' (n = 15). Fifty-nine percent of study participants met recommendations for weekly physical activity.

Repeated measures MANOVAs were conducted, one for each study variable. The between subjects factor was USDHHS recommendation condition and within subject factors were time of day and study day. The dependent variables were positive affect, negative affect, and physical activity. Thus a 2 x (4 x 6) repeated measures MANOVA was conducted. The multivariate analysis tested the null hypotheses that individuals who met recommendations for physical activity were no different than individuals who did not meet recommendations on dependent measures of positive affect, negative affect, and physical activity. The analysis also tested the null hypothesis whether there differences in the condition on dependent measures varied by study day and time of day.

Multivariate between-subject results found that recommendation condition had a significant relation with the dependent measures ($\lambda = .69$, $F(3, 33) = 4.91$, $p = .01$). Between-subjects follow-up tests found significant differences in recommendation condition on dependent measures of physical activity ($F(1, 35) = 11.06$, $p = .00$). Specifically, individuals who met Surgeon General requirements for physical activity had higher mean levels of physical activity ($M = 490.77$, $SD = 22.29$) than individuals who did not meet physical activity requirements ($M = 374.39$, $SD = 26.99$). Surgeon General condition did not differ on dependent measures of positive affect ($F(1,35) = .53$, $p = .47$) or negative affect ($F(1,35) = 1.53$, $p = .23$).

Multivariate results for within-subject tests found that stability in physical activity did not have a significant relation with time of day on dependent measures ($\lambda = .59$; $F(9, 27) = 2.08$, $p = .07$) or study day ($\lambda = .41$, $F(15, 21) = 2.01$, $p = .07$).

Chapter 5: Discussion

Summary of Study Findings

The main purpose of this dissertation study was to examine intraindividual variability, individual, and group relations between daily affect and physical activity among non-sedentary community-dwelling older women. The study was conducted using hand-held computers that paged older women four times a day for six consecutive days. Significant positive relations among positive affect and physical activity at the individual and group levels were hypothesized. Significant negative relations were hypothesized among negative affect and physical activity at the group individual and group levels. Results were mixed. The following discussion, as outlined, will (a) outline overall findings at the individual and group levels, (b) provide possible explanations for findings at each level, (c) discuss limitations, implications, and future directions separately for individual and group findings, (d) discuss overall study limitations and future directions, and (e) provide a study conclusion.

Individual Level Findings. At the individual level, about one-third of participants showed a significant, positive relation between positive affect and physical activity over the entire study period. About thirteen percent of participants showed a significant negative relation between negative affect and physical activity. For both sets of analyses significant, linear and quadratic trends emerged for those participants exhibiting a relation between measures of affect and physical activity.

Intraindividual Variability Findings. When investigating intraindividual variability in positive affect, negative affect, and physical activity, results showed that about one-third of participants demonstrated a significant positive relation among variability in positive affect and variability in physical activity over the course of the study. About ten percent of the sample had a significant negative relation in variability in negative affect and physical activity over the course of the study. For both sets of analyses, significant linear and quadratic trends emerged.

Overall, when investigating the group level, stability in positive affect did not have a significant relation with dependent measures of positive affect, negative affect, or physical activity over the six study days. However, when separating time of day from study day, repeated measures analyses found that more stable positive affect individuals differed from from less stable positive affect individuals on dependent measures of positive affect. No significant relations were found for negative affect or physical activity. Results indicated that stability in positive affect's relation to the dependent measures significantly differed by time of day, but not between study days. While more stable positive affect individuals began and ended their day with similar levels of positive affect, less stable individuals began with low levels of positive affect, increased at 1200 hr and remained at high levels for the rest of the day.

Overall, when investigating stability in negative affect, results found group differences for the dependent measure of negative affect. Specifically, less stable negative affect individuals had lower mean levels of negative affect than more stable negative affect individuals. However, stability in negative affect did not differ by study day or time of study day on dependent measures.

Overall, when investigating stability in physical activity, group differences on the dependent measure, physical activity emerged. Specifically, less stable physical activity individuals had higher mean levels of physical activity than more stable physical activity individuals. Differences in stability in physical activity were also found for time of day, but not study day for the dependent measure physical activity. Less stable and more stable individuals followed the same daily pattern; low levels at 800 hr, raised levels at 1200 hr, then a decline in physical activity thereafter until 2000 hr. However, less stable individuals remained at higher levels of physical activity throughout the day.

Primary Group Level Findings. In group level analyses, for the most part, affect and physical activity were not related to one another across study days. Specifically, affect and physical activity did not predict one another in an Early (Monday – Wednesday) to Late (Thursday – Saturday) path model, or in an Early (Mon-Tues) – Mid (Weds – Thurs) – Late (Fri – Sat) path model. Interestingly, however, early positive affect predicted mid-week positive affect and early week physical activity predicted mid-week physical activity. Both paths indicated a statistically significant positive relation. However, when looking at negative affect, only mid-week negative affect predicted late week negative affect. In addition early week negative affect predicted, in a negative direction, late week physical activity.

To more acutely test the relations of affect and physical activity over time within an individual, a repeated measures analysis of variance was conducted with time of day and day of study as independent within subject factors and positive affect, negative affect, and physical activity (kcals) as dependent measures. Results found that positive affect, negative affect, nor physical activity differed by day. Thus, individuals were fairly stable in their mean daily levels of affect and physical activity. No significant relations between negative affect and time of day were found. However, positive affect and physical activity differed by time of day. Thus, variability in study measures occurred within the day at the individual and group level over the study's six test days. Specifically, positive affect's relation to time of study was best described as an inverted-U shaped cubic function. Specifically, women started the day with low mean levels of positive affect (800 hr), increased to their highest mean levels of positive affect by 1200 hr, then a steady decrease in positive affect until the last testing session at 2000 hr. Physical activity was also best described as a cubic function. In this case, women followed much the same daily pattern as positive affect.

Exploratory Group Level Findings. Exploratory path analyses were conducted to determine whether third variables known to fluctuate on a daily basis were significantly related to affect and physical activity. Due to power limitations, these analyses were conducted at the group level. Results indicated a significant, negative relation between positive affect and negative daily indicators (i.e., daily hassles and physical symptoms). Results also indicated a significant, positive relation between daily hassles and physical symptoms and negative affect. Unexpected, however, was a significant positive relation between daily hassles and physical symptoms and physical activity. Daily temperature held a significant, positive relation with physical activity and a significant, negative relation with negative affect. No significant relations were found for daily temperature and positive affect. Daily uplifts did not have a significant relation with affect or physical activity. Daily social interactions did not provide a good fit of the data to the hypothesized path model, thus discussing individual path results would be inappropriate.

Finally, exploratory analyses investigated group differences in whether a participant met USDHHS' (1996) physical activity recommendations in affect and physical activity. Results indicated that women who met recommendations over the course of the study had higher mean level of physical activity then women who did not meet recommendations. No group differences were found for positive or negative affect. The study did not finding any differences between groups when separating study day from study time in a within-subjects analysis on study variables.

Explanation of Individual Level Study Findings

Considering findings from previous research (Gauvin et al., 2000; Steptoe et al., 1998) and results from pilot testing, it was expected that most individuals would show a positive relation between positive affect and physical activity over the study week. Contrary to expectation, only 35% of the study sample showed a significant across-day positive relation between positive affect and physical activity. Fewer individuals (< 15%) showed a significant negative relation between negative affect and physical activity. There are several possible explanations for the findings. The first explanation could be that the relations between positive affect and physical activity are complex, thus requiring additional within and between daily data points. For instance, in several instances, all three functions (linear, quadratic, and cubic) were statistically significant, but not statistically different in their ability to account for variance in physical activity. Thus, future studies will need to collect more points of measurement for a longer period of time to determine which function best represents the relation between affect and physical activity. One conclusion might be that for women who do hold a significant relation between affect and physical activity, their relations are both positive and negative. For example, some women displayed an initial positive relation in the first half of the week and an eventual negative relation in the second half of the week.

Of course, the alternative conclusion derived from study findings would be that the majority of non-sedentary older women simply do not have an important relation between daily affect and physical activity (Bhui & Fletcher, 2000; Vendrig & Lousberg, 1997). For instance, Vendrig and Lousberg (1997) similarly found that one-third of adults with pain in their study showed a relation between affect and physical activity. However, this study used a patient population who was experiencing pain and was relatively sedentary. In addition, Vendrig and Lousberg used only one item to represent physical activity. Lastly, about 13% of the study sample indicated a significant relation between negative affect and physical activity. This finding was likely due to the limited variability in negative affect for most individuals throughout the study. As will be discussed, future research requires the development of an affective measurement that represents the complexity of positive and negative emotions experienced by older adults.

An important question that could be asked of participants in future studies would be whether or not they hold physical activity as an important daily goal. If the participant does not have a physical activity goal, such as going for a walk during the day, then she might not show a change in affect related to achieving or not achieving the personal goal. Despite the study's unexpected findings, there are important potential implications for intervention research on affect and physical activity. For instance, it is important for intervention researchers to know that a certain percent of a study population is likely to hold strong day-to-day, or carry over effects from positive affect and physical activity. Future intervention studies could involve requiring a baseline assessment of physical activity and affect. Perhaps a baseline assessment, such as the one imposed in the current study, is a good tool to identify participants who would benefit the most from intervention research. However, these implications must be drawn with caution, as the current study sample was small. Future study replications are warranted.

Explanation of Intraindividual Variability Findings

The relation between intraindividual variability in affect and physical activity over the course of the study was almost identical to aforementioned individual findings. As proposed, however, the current study split participants by their daily standard deviations on study measures. Thus, individuals who were stable in positive affect were compared to less stable positive affect participants. Similar analyses were conducted for negative affect and physical

activity. Therefore, the groups were not necessarily mutually exclusive. For instance, an individual could have been stable in positive affect, but less stable physical activity.
The purpose of the analysis was to determine whether more stable individuals differed from less stable individuals on the study measures by (a) time of day or (b) study day. Overall, findings indicated that less stable individuals had higher mean levels of positive affect and physical activity.

One explanation for these findings could have been that persons who fluctuated more on measures of affect and physical activity are simply more active in their daily environments. These individuals fluctuate, because they 'do' more throughout the day. Interestingly, when looking at group differences by time of study, individuals in the stable and less stable groups follow the same general daily trend in affect and physical activity, just at a lower mean level. Implications of this finding for future research would be that it could take a very small manipulation, such as having participants vary their within-day physical activities to produce the changes seen with less stable individuals. However, results from this analysis should be taken lightly due the small sample size and relative daily stability of the sample on affective and physical activity measures.

Explanation for Group Level Findings.

Overall, at the group level, affect and physical activity did not significantly relate to one another over the study period. However, early week negative affect predicted mid-week physical activity in the negative direction. These results must be discussed with caution, however, considering the relatively low mean level of negative affect within the study sample. Many of the potential reasons for these findings are similar to those for individual level findings (i.e., relative stability). Important to note, however, was that the within-subjects repeated measures analysis found that affect and physical activity differed by time of day, not day of study. Specifically, both positive affect and physical activity were best described by an inverted U-shaped cubic function. Specifically, both variables started the day with low mean levels, increased drastically at 1200 hr and either stabilized (physical activity) and declined until the last measurement at 2000 hr. Thus, looking at the study sample within-subject analyses, results would suggest that despite daily stability, there is considerable variability within a day on study measures, and the pattern of fluctuation is similar for positive affect and physical activity. One reason for these findings could have been that participants were asked at 800 hr how active they were over the last 4 hours; suggesting the participant to indicate how active she was from 0400 hr to 0800 hr. It may have been obvious that activity and positive affect would be low on the first response of the morning. Nonetheless, the relation of the variables over the day was best described by a cubic function, indicating that there were additional, important within-day fluctuations in positive affect and physical activity throughout the day than from 0800 hr until 1200 hr.

In addition, within-day results replicated previous findings (Focht et al., 2004; Gauvin et al., 2000; Thayer, 1978). That is, affect and physical activity are highest during the mid-day hours (12 – 2) and are lower in the morning, late afternoon, and evening hours. Even more interesting was that the current study's were replicated using different measures of physical activity and affect than the aforementioned studies.

Focht and colleagues, Gauvin and colleagues, and Steptoe and colleagues found positive affect and physical activity to be higher on exercise days and lower on non-exercise days, suggesting a synchronous relation between the variables. This finding was not supported in the current study. One reason might be that, unlike the aforementioned studies, it did not recruit participants going through an exercise intervention (Focht et al.; Steptoe et al) or healthy, active participants recruited solely from a health club (Gauvin, et al., 2001). Therefore, the current study offers important, additive findings to previous research using a sample of non-sedentary community-dwelling women. In addition, the current study offered a more accurate way of testing relations between daily affect and physical activity using hand-held computers. Finally, the study used more valid measures of affect and physical activity that those used in naturalistic studies.

Implications for the aforementioned findings are potentially far-reaching. Keeping in mind the relatively small sample size, this study replicated previous findings regarding within-day variability in affect and physical activity in a sample of community-dwelling women using more accurate measures than previously mentioned studies. Also, this study suggests that for a woman to gain a cumulative daily benefit in positive affect and physical activity, interventions should be carried out in less active hours of the day (i.e., morning, late afternoon, evening hours).

Exploratory group-level analyses incorporated third variables to determine whether ‘other’ daily factors could be accounting for daily levels of affect and physical activity. Previous research has suggested that variables such as daily social interaction, stressors, physical symptom, and temperature could contribute to daily affective states and physical activity (Rook, 2001; Salovey & Birnbaum, 1989; Watson, 1988). Despite previous findings (Rook, 2001), daily positive and negative social interactions were not found to have a significant relation with positive affect or physical activity. According to Rook and Carstensen (1992) the current study would have predicted that participants would hold emotional and social goals as important in their daily lives. Thus, the study would have expected that higher levels of daily positive affect would be related to higher levels of positive social interactions. One reason for this finding was that daily social interactions were very stable across study days and the measure was forced choice (yes or no). Future research might consider asking a follow up question for social interactions regarding the extent to which the interaction (a little to a great deal) affected the participant's affective state. For instance, if a mother receives a call from her daughter every day and the conversations were not provoking, the mother might be unlikely to notice a relation between socially interacting with her daughter and feeling more generally positive.

Contrary to expectations, daily physical symptoms and daily hassles were positively related to physical activity. One reason for these findings might be that the women in the current study were *too* active for their physical functioning level. This is possible, as according to the study's measure of weekly physical activity, it suggested that about 60% of the women in the study were meeting recommendations of moderate physical activity at least 4 of the 6 study days for at least 30 min at a time. However, it is possible that the physical activities conducted by the participants were the 'wrong kind' of activities. Thus there was little functional benefit for the activities conducted by the women, if not, a deficit. For instance, many of the women in the current study were overweight or obese (81.4%) and/or had arthritis (53.5%). If the women were not doing specific strengthening activities to improve their condition, a busy day of 'hassles' would be related to higher energy expenditure and increased number of physical symptoms at the end of the day. In fact, in correlational analyses, the study found that daily hassles and physical symptoms were significantly, moderately related a positive direction. Although research reviewed by DiPietro (2001) found that certain daily lifestyle behaviors are beneficial to overall energy expenditure levels in older adults, studies have not considered activities of moderate intensity to have a negative impact on health and well-being. Future research could compare different groups of healthy (normal weight, exercise, etc) compared to unhealthy women (obese, do not exercise) on daily physical activity, hassles, and physical symptom reporting to determine if the relations in the current study would be different.

Results found that temperature held a significant, negative relation with negative affect and a significant, positive relation with physical activity. Although intervention studies on affect and physical activity rarely consider temperature or weather, it appears that it plays a role in the daily affect and physical activity levels of older women. Anecdotally, several participants noted in an open-ended section of their journal what the weather was like. Additionally, over 75% of the responses on the daily hassles and uplifts scale endorsed the ‘weather’ item, indicating that the weather was a little or a great deal of a hassle or an uplift. Specifically, most women endorsed the weather on days in which it was an Uplift (60.1%). Future affective and physical activity research must consider participants’ attitudes toward the weather and offer alternative in-door physical and affective activities on ‘bad weather days’. At the very least, future studies should collect such information to control for in analyses as an extraneous variable.

Overall, findings from the third variable analyses suggested that there were several daily factors affecting one’s affect and physical activity throughout the day. Future research needs larger sample sizes and more individual data points to fully understand the role of each well-being indicator in the daily life of a community-dwelling older adult. Finally, the results from this study suggested that any daily affective or physical activity intervention with older women should consider daily physical symptoms, hassles, and temperature when conducting their study.

Study Limitations and Future Directions

One study limitation was the small sample size (N = 37) as well as the limited number of observations for each participant (n = 24). Therefore, there was limited power to test the potential day-to-day relations among affect and physical activity when third variables were included in the model. Future research might include a larger number of participants, more measurements per day and extend the study period to two weeks. However, it is important to note that this study was the first of its kind, as well as participant-intensive. Future research would need to secure larger monies to pay the participant for her time and efforts.

A second limitation of the study was lack of generalizability of study findings to the larger community-dwelling older female population. For instance, the study had a fairly small sample size, was racially homogeneous, mostly obese, of high economic standing, and from one geographic location (e.g., the Morgantown, WV area). Also, women volunteer to be participants, with very little monetary compensation. Therefore, self-selection is one limitation of the current study sample. On the other hand, women in the sample were representative in comparison to national samples on health indicators, such as grip strength. Also the sample findings on within-day variation in affect and physical activity were validated with previously conducted studies (Focht et al., 2004; Gauvin et al., 2000). With additional funding, future studies could recruit from racially and economically diverse study population. Future studies would also recruit different 'activity' groups of community-dwelling older women. For instance, the study could recruit sedentary, low activity, moderate, and vigorously active community-dwelling older women. A final limitation of the study sample was that it was entirely female. Previous research has found that the affective changes related to exercise behavior was beneficial to older men and not older women (Bhui & Fletcher, 2000). Therefore, while men are more likely to exercise than women and have less fluctuation in affect, it is possible that men might be more likely to show a relation between affect and physical activity over time. Future research should be extended to community-dwelling older men.

Another limitation of the study was measurement. Specifically, the study incorporated several points of measurement during and across days. It is possible that the relative stability in answers was due to testing effects rather than reflecting true affect and physical activity. The study attempted to account for potential testing effects by counter balancing the presentation of affect and physical activity across participants. No differences were found. However, due to program limitations, the study was not able to counterbalance the measures with each participant testing session. One way to remedy potential testing effects in future studies would be to (a) counterbalance measurement presentation for each testing session, (b) randomize item presentation for each measure for each testing session, and (c) incorporate more reliable and valid endorsable items for each measurement. Future research will involve a systematic testing of the aforementioned methods.

Due to the daily nature of the study, the current study wanted to use the best and shortest measurements of affect and physical activity. However, the study found that perhaps additional, more representative indicators of positive and negative affect are necessary in order to reflect valid fluctuations and daily mean levels of affect. With regards to physical activity, the study did not inquire about specific exercises conducted by participants. If the relations between affect and physical activity only occur when physical activities are purposeful exercises, the current study would not be able to determine that. Thus, future studies would collect information on specific exercises and physical activities in order to determine their relations with affect.

Of careful consideration when drawing conclusions regarding physical activity, was the method of measuring physical activity in the current study. The current study wanted to gain the most accurate assessment of physical activity. Physical activity in the current study was defined as any body movement that resulted in energy expenditure. Energy expenditure was measured in kcals. The measurement of kcals was a combination of the participants' resting metabolic rate (RMR), the level of physical activity (MET value), and time in the activity. While age was considered in calculating RMR, it was not necessarily considered when calculating kcals from MET values. Although the physical activity measure was validated in a group of young and middle-aged adults, it has not been validated in a group of older adults. Therefore, MET values assigned to the older adult for a particular activity might be lower or higher depending on the level of exertion an older woman produced in comparison to younger and middle-aged adults. Given that the study sample was fairly old (M_{age} = 72), future research is warranted. Future research would focus on incorporating research from Stewart et al. regarding the adjustment of MET values based on age and gender. Although the current study was cautious in drawing conclusions on physical activity, it is important to note that the study attempted to use the best age-sensitive measures of physical activity. Also of importance, was that despite the potential measurement limitations for physical activity, within-day findings were similar to those found in previous studies using similar procedures (Focht et al., 2004; Gauvin et al., 2000).

Also of note regarding the measurement of physical activity, was that the correlation, although statistically significant, between physical activity as measured by the kcals and the number of steps on the pedometer was relatively low (r = .198 - .270). This is similar to the correlation found between the PAS and accelerometers in Aadhal and Jorgensen (2003). Potential reasons for the low correlation might be (a) the current study sample was relatively sedentary, thus walking was not a large part of their energy expenditure, (b) pedometers were inaccurate for older women and had relatively low participant compliance, and/or (c) participants overestimated their time and level of physical activities on the PAS. Future research is warranted to further assess the reliability and validity of the PAS and pedometer use among older women.

An equipment limitation in the current study was that all important study data were collected on hand-held computers. The program used for the hand-held computer, would only allow for the designated four points of fixed measurement throughout the day. Additional data points would have extended the measurement points into unreasonable late evening hours and early morning hours. However the use of hand-held computers allowed for control of retrospective reporting. As a downside, however, if a participant missed a time of measurement, she could not go back in answer. The result was at least 50% of the study sample missed at least one time of measurement. However, the overall missing data was minimal and not detrimental to the overall study findings. Important to note was that persons who missed data sessions were more likely to be older than women who did not miss data sessions. The most commonly reported reason for missing data was that the participant did not hear the page. The current study was limited in the volume of the page allowed with the hand-held computers. Additionally, the participant often did not hear the page because she was sleeping. Thus, future studies must tackle program-level issues by increasing volume level as well times for testing sessions. For instance, the 0800 hr testing session was simply too early for some individuals. Another equipment issue was that the text font on the Palm Pilot was relatively small. Future research would not want to screen participants out of the study due to small text size on the hand-held computer. Future programming research must work on solving this problem related to text size and screen clarity on the hand-held computers to maximize participant comfort level and response.

A final equipment limitation of the current study was the large numbers of hand-held computers that malfunctioned and expired. My assumption was that equipment malfunctions were a result of the out-dated Palm Pilots© used in the study. Older Palm Pilots© were used because the program would only run on older Palm Pilots©. In addition, the older Palm Pilots©

were no longer available new in stores, thus they were purchased used off of the Internet. Future research using newer programs on new Palm Pilots© would unlikely result in frequent equipment malfunctions.

Conclusion

The current study tested the individual and group level relations among affect and physical activity in non-sedentary community-dwelling older women. Women were tested four times a day for six consecutive study days. Findings were mixed. Overall, results did not support hypotheses that affect and physical activity are related over several days. However, a small sub-sample of the current study did show such a relation. Results found that women who were less stable in daily measures of affect and physical activity had, on average, higher levels of positive affect, lower levels of negative affect, and higher levels of daily activity than more stable women. An additional finding was that most variability in affect and physical activity occurs within a day's period, however mean day levels of affect and physical activity are stable from day to day. Important implications from the current study for intervention research was (a) the need for obtaining baseline affect and physical activity levels for older women and (b) targeting intervention research for specific times within a day when affect and activity level are low, thus maximizing benefits from intervention research. However, these intervention implications must be drawn cautiously, as the current study sample was small. Findings from the current study also suggest that future research should target the development of more valid measures of affect and physical activity for older women. Future research is also required to improve the reliable use of hand-held computers in daily studies of older adults.

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Table 1

Demographic Information on Participants (N = 42)

Variable	N	%
Race		
Caucasian	42	100.0
Marital Status		
Married	19	45.2
Married, but Separated	1	2.4
Widowed	13	31.0
Divorced	6	14.3
Single, Never Married	3	7.1
Living Arrangement		
Live Alone	23	53.5
Live with Others	18	44.2
Missing	1	2.3

Table 1 (cont'd)

Demographic Information on Participants (N = 42)

Variable	**N**	**%**
Education		
Less than High School	2	4.8
High School	15	35.7
Some College	16	38.1
College Degree	3	7.1
Some Graduate	6	14.3
Income		
$4,000-11,999	9	21.4
$12,000-27,999	9	21.4
$28,000-49,999	8	19.0
Over $50,000	8	19.0
Missing	8	19.0
Work Status		
Retired	33	78.6
Work Part-Time	4	9.5
Work Full-Time	3	7.1
Disabled	2	4.8

Table 2

Participant Health Information (N = 42)

Variable	**N**	**%**
BMI		
Underweight (< 18.5)	0	0
Normal (18.5-24.9)	8	19.0
Overweight (25-29.9)	15	35.7
Obese (> 30.0)	19	45.2
Health Conditions (>15%)		
Arthritis	23	53.5
High Cholesterol	19	44.2
High Blood Pressure	18	41.9
Back Problems	10	23.3
Diabetes	9	20.9
Bladder Problems	8	18.6
Cataracts	8	18.6

Table 3

Participant Health Information (N = 42)

Variable	N	Mean	Standard Deviation	Range
Waist Circumference	39	40.90	6.04	30 – 53.50
Blood Pressure – Systolic+	42	130.11	13.35	102 – 178.67
Blood Pressure – Diastolic+	42	72.54	9.63	56.67 – 90.00
Grip Strength – Dominant+	39	18.74 kg	7.53	1.33 – 38.33
Grip Strength – Non-dominant+	38	18.98 kg	6.04	7.00 – 32.00
Walk Normal 10 ft	42	4.53 sec	1.71	2.72 – 10.43
Walk Fast 10 ft	42	3.33	1.42	1.90 – 9.25
Number of Prescribed Medications	42	3.81	2.99	0 - 12

+ Participant blood pressure and grip strength were taken three times for accuracy. Mean represents the average of the three trials.

Table 4

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 1

Function	B	SE B	β	R^2	F
Linear				.141	F(1, 22) = 3.604, p = .07
Physical Activity	.056	.029	.375		
Quadratic				.309	F(2, 21) = 4.697, p = .02
Physical Activity	.522	.208	3.516*		
Physical Activity	-.001	.000	-3.167*		
Cubic+					

*p < .05, **p < .01

+ Tolerance limits reached

Table 5

Regression Curve Estimations for Positive Affect and Physical Activity (kcals/4hr) for Participant 2

Function	B	SE B	β	R^2	F
Linear				.505	F(1, 22) = 22.474, p = .00
Physical Activity	.027	.006	.711**		
Quadratic				.510	F(2, 21) = 10.907, p = .00
Physical Activity	.012	.035	.323		
Physical Activity	.000	.000	.393		
Cubic				.718	F(3, 20) = 7.101, p = .00
Physical Activity	.100	.175	2.641		
Physical Activity	-.000	.000	-4.448		
Physical Activity	.000	.000	2.585		

* p < .05, ** p < .01

Note. Individual t-tests indicated that the line was best described by a linear function.

Table 6

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 3

Function	B	SE B	β	R^2	F
Linear				.409	$F(1, 22) = 15.22, p = .00$
Physical Activity	.019	.005	.640**		
Quadratic				.477	$F(2, 21) = 9.568, p = .00$
Physical Activity	.048	.018	1.635*		
Physical Activity	-.000	.000	-.000		
Cubic				.529	$F(3, 20) = 7.492, p = .00$
Physical Activity	.209	.109	7.112		
Physical Activity	-.000	.000	-14.499		
Physical Activity	.000	.000	8.291		

* $p < .05$, ** $p < .01$

Note. Individual t-tests indicated that the line was best described by a linear function.

Table 7

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 4

Function	B	SE B	β	R^2	F
Linear				.410	F(1, 22) = 15.302, p = .00
Physical Activity	.021	.005	.640**		
Quadratic				.664	F(2, 21) = 20.747, p = .00
Physical Activity	.101	.020	3.009**		
Physical Activity	-.000	.000	-2.421**		
Cubic				.681	F(3, 20) = 14.263, p = .00
Physical Activity	.176	.074	5.246*		
Physical Activity	-.000	.000	-7.575		
Physical Activity	.000	.000	3.004		

* p < .05, ** p < .01
Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 8
Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 5

Function	B	SE B	β	R^2	F
Linear				.163	F(1, 22) = 4.281, p = .05
Physical Activity	.013	.006	.404*		
Quadratic				.187	F(2, 21) = 2.413, p = .11
Physical Activity	-.015	.036	-.461		
Physical Activity	.000	.000	.879		
Cubic				.191	F(3, 20) = 1.571, p = .23
Physical Activity	-.074	.195	-2.296		
Physical Activity	.000	.001	4.659		
Physical Activity	-.000	.000	-2.002		

* p < .05

Table 9

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4 hr) for Participant 10

Function	B	SE B	β	R^2	F
Linear				.173	F(1, 22) = 4.590, p = .04
Physical Activity	.002	.001	.416*		
Quadratic				.187	F(2, 21) = 2.417, p = .11
Physical Activity	-.000	.004	-.096		
Physical Activity	.000	.000	.525		
Cubic				.234	F(3, 20) = 2.037, p = .14
Physical Activity	-.018	.016	-4.098		
Physical Activity	.000	.000	18.236		
Physical Activity	-.000	.000	-13.848		

* p < .05

Table 10

Regression Curve Estimations for Positive Affect and Physical Activity (kcals/4hr) for Participant 14

Function	B	SE B	β	R^2	F
Linear				.259	F(1, 22) = 7.709, p = .01
Physical Activity	-.068	.024	-.509*		
Quadratic				.280	F(2, 21) = 4.083, p = .03
Physical Activity	.120	.244	.901		
Physical Activity	-.000	.000	-1.417		
Cubic+					

* $p < .05$
\+ Tolerance limits reached
Note. Individual t-tests indicated that the line was best described by a linear function.

Table 11.

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 15

Function	B	SE B	β	R^2	F
Linear				.314	F(1, 22) = 10.075, p = .00
Physical Activity	.010	.003	.560**		
Quadratic				.482	F(2, 21) = 9.769, p = .00
Physical Activity	.036	.010	1.948**		
Physical Activity	-.000	.000	-1.447*		
Cubic				.517	F(3, 20) = 7.135. p = .00
Physical Activity	.079	.037	4.306*		
Physical Activity	-.000	.000	-7.308		
Physical Activity	.000	.000	3.666		

* p < .05, ** p < .01
Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 12

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 21

Function	B	SE B	β	R^2	F
Linear				.207	F(1, 22) = 5.747, p = .03
Physical Activity	.008	.003	.455*		
Quadratic				.232	F(2, 21) = 3.172, p = .06
Physical Activity	.023	.019	1.334		
Physical Activity	-.000	.000	-.893		
Cubic				.276	F(3, 20) = 2.547, p = .08
Physical Activity	-.042	.061	-2.46		
Physical Activity	.000	.000	7.506		
Physical Activity	-.000	.000	4.720		

* p < .05

Table 13

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 25

Function	B	SE B	β	R^2	F
Linear				.301	F(1, 22) = 9.468, p = .01
Physical Activity	.014	.005	.549**		
Quadratic				.363	F(2, 21) = 5.995, p = .01
Physical Activity	.049	.024	1.865		
Physical Activity	-.000	.000	-1.341		
Cubic				.412	F(3, 20) = 4.665, p = .01
Physical Activity	.195	.117	7.510		
Physical Activity	-.000	.000	-13.225		
Physical Activity	.000	.000	6.430		

** $p < .01$
Note. Individual t-tests indicated that the line was best described by a linear function.

Table 14

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 28

Function	B	SE B	β	R^2	F
Linear				.168	F(1, 22) = 4.445, p = .05
Physical Activity	.010	.005	.410*		
Quadratic				.411	F(2, 21) = 2.135, p = .14
Physical Activity	.006	.028	.242		
Physical Activity	.000	.000	.170		
Cubic				.169	F(3, 20) = 1.360, p = .28
Physical Activity	.016	.095	.644		
Physical Activity	-.000	.000	-.000		
Physical Activity	.000	.000	.481		

* p < .05

Table 15

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 32

Function	B	SE B	β	R^2	F
Linear				.289	F(1, 22) = 8.937, p = .01
Physical Activity	-.008	.003	-.537**		
Quadratic				.302	F(2, 21) = 4.539, p = .02
Physical Activity	-.017	.014	-1.091		
Physical Activity	.000	.000	.565		
Cubic				.385	F(3, 20) = 4.171, p = .02
Physical Activity	.072	.056	4.600		
Physical Activity	-.000	.000	-11.776		
Physical Activity	.000	.000	6.870		

** $p < .01$

Note. Individual t-tests indicated that the line was best described by a linear function.

Table 16

Regression Curve Estimation for Positive Affect and Physical Activity (kcals/4hr) for Participant 35

Function	B	SE B	β	R^2	F
Linear				.265	F(1, 22) = 7.944, p = .01
Physical Activity	.009	.003	.515**		
Quadratic				.268	F(2, 21) = 3.843, p = .04
Physical Activity	.005	.015	.286		
Physical Activity	.000	.000	.234		
Cubic				.287	F(3, 20) = 2.686, p = .07
Physical Activity	-.024	.042	-1.362		
Physical Activity	.000	.000	4.532		
Physical Activity	-.000	.000	-2.718		

** $p < .01$

Note. Individual t-tests indicated that the line was best described by a linear function.

Table 17

Regression Curve Estimation for Negative Affect and Physical Activity (kcals/4hr) for Participant 2

Function	B	SE B	β	R^2	F
Linear				.000	F(1, 22) = 0.002, p = .961
Physical Activity	.000	.003	.010		
Quadratic				.312	F(2, 21) = 4.772, p = .02
Physical Activity	-.043	.014	-3.340**		
Physical Activity	.000	.000	3.397**		
Cubic				.326	F(3, 20) = 3.222, p = .04
Physical Activity	.001	.071	.042		
Physical Activity	-.000	.000	-.000		
Physical Activity	.000	.000	3.773		

** $p < .01$

Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 18

Regression Curve Estimation for Negative Affect and Physical Activity (kcals/4hr) for Participant 9

Function	B	SE B	β	R^2	F
Linear				.267	F(1, 22) = 8.006, p = .01
Physical Activity	.034	.012	.517**		
Quadratic				.277	F(2, 21) = 4.022, p = .03
Physical Activity	.085	.094	1.280		
Physical Activity	-.000	.000	-.000		
Cubic+					

** p < .01
+ Tolerance limits reached
Note. Individual t-tests indicated that the line was best described by a linear function.

Table 19

Regression Curve Estimation for Negative Affect and Physical Activity (kcals/4hr) for Participant 15

Function	B	SE B	β	R^2	F
Linear				.201	F(1, 22) = 5.550, p = .03
Physical Activity	-.004	.002	-.449*		
Quadratic				.543	F(2, 21) = 12.487, p = .00
Physical Activity	-.024	.005	-2.430**		
Physical Activity	.000	.000	2.065**		
Cubic				.569	F(3, 20) = 8.815, p = .00
Physical Activity	-.044	.019	-4.468*		
Physical Activity	.000	.000	7.132		
Physical Activity	-.000	.000	-3.170		

* $p < .05$, ** $p < .01$
Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 20

Regression Curve Estimation for Negative Affect and Physical Activity (kcals/4hr) for Participant 32

Function	B	SE B	β	R^2	F
Linear				.421	F(1, 22) = 15.990, p = .00
Physical Activity	.007	.002	.649**		
Quadratic				.422	F(2, 21) = 7.655, p = .00
Physical Activity	.009	.009	.782		
Physical Activity	-.000	.000	-.136		
Cubic				.450	F(3, 20) = 5.449, p = .01
Physical Activity	-.029	.039	-2.528		
Physical Activity	.000	.000	7.043		
Physical Activity	-.000	.000	-3.997		

** $p < .01$
Note. Individual t-tests indicated that the line was best described by a linear function.

Table 21

Regression Curve Estimation for Negative Affect and Physical Activity (kcals/4hr) for Participant 33

Function	B	SE B	β	R^2	F
Linear				.086	F(1, 22) = 2.064, p = .16
Physical Activity	.003	.002	.293		
Quadratic				.421	F(2, 21) = 7.598, p = .00
Physical Activity	-.019	.006	-1.971**		
Physical Activity	.000	.000	2.337**		
Cubic				.426	F(2, 22) = 4.940, p = .01
Physical Activity	-.032	.029	-3.312		
Physical Activity	.000	.000	5.267		
Physical Activity	-.000	.000	-1.667		

** p < .01

Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 22

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 1

Function	B	SE B	β	R^2	F
Linear				.162	F(1, 22) = 4.262, p = .05
Physical Activity	.403	.195	.403*		
Quadratic				.553	F(2, 21) = 12.989, p = .00
Physical Activity	.094	.163	.094		
Physical Activity	-.191	.213	-.697**		
Cubic				.565	F(3, 20) = 8.650, p = .00
Physical Activity	-.127	.343	-.127		
Physical Activity	-.858	.227	-.656**		
Physical Activity	.179	.244	.265		

* p < .05, ** p < .01
Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 23

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 2

Function	B	SE B	β	R^2	F
Linear				.298	F(1, 22) = 9.344, p = .01
Physical Activity	.298	.150	.546**		
Quadratic				.299	F(2, 21) = 4.468, p = .02
Physical Activity	.447	.189	.532*		
Physical Activity	.017	.154	.024		
Cubic				.303	F(3, 20) = 2.897, p = .06
Physical Activity	.514	.270	.612		
Physical Activity	.104	.292	.153		
Physical Activity	-.062	.174	-.198		

* $p < .05$, ** $p < .01$
Note. Individual t-tests indicated that the line was best described by a linear function.

Table 24

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 3

Function	B	SE B	β	R^2	F
Linear				.280	F(1, 21) = 8.153, p = .01
Physical Activity	.498	.174	.529**		
Quadratic				.288	F(2, 20) = 4.038, p = .03
Physical Activity	.490	.178	.521**		
Physical Activity	.114	.240	.090		
Cubic				.304	F(3, 19) = 2.772, p = .07
Physical Activity	.786	.473	.836		
Physical Activity	.134	.245	.106		
Physical Activity	-.225	.332	-.342		

** $p < .01$
Note. Individual t-tests indicated that the line was best described by a linear function.

Table 25

Regression Curve Estimation Table for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 4

Function	B	SE B	β	R^2	F
Linear				.234	F(1, 22) = 6.727, p = .02
Physical Activity	.484	.187	.484*		
Quadratic				.512	F(2, 21) = 11.015, p = .00
Physical Activity	.690	.164	.690**		
Physical Activity	-.665	.192	-.566**		
Cubic				.512	F(3, 20) = 7.00, p = .00
Physical Activity	.730	.401	.730		
Physical Activity	-.611	.200	-.563**		
Physical Activity	-.028	.254	-.044		

* p < .05, ** p < .01

Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 26

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 5

Function	B	SE B	β	R^2	F
Linear				.026	F(1, 22) = .580, p = .455
Physical Activity	.160	.210	.160		
Quadratic				.365	F(2, 21) = 6.031, p = .01
Physical Activity	.180	.174	.180		
Physical Activity	.725	.216	.583**		
Cubic				.367	F(3, 20) = 3.864, p = .02
Physical Activity	.291	.467	.291		
Physical Activity	.723	.221	.582**		
Physical Activity	-.080	.309	-.120		

** $p < .01$

Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 27

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 9

Function	B	SE B	β	R^2	F
Linear				.022	F(1, 18) = 0.404, p = .533
Physical Activity	-.148	.233	-.148		
Quadratic				.308	F(1, 17) = 3.790, p = .04
Physical Activity	.159	.232	.159		
Physical Activity	-.792	.298	-.617*		
Cubic				.311	F(1, 16) = 2.403, p = .11
Physical Activity	.021	.653	.021		
Physical Activity	-.829	.348	-.646*		
Physical Activity	.112	.495	.162		

* p < .05

Table 28

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 11

Function	B	SE B	β	R^2	F
Linear				.040	F(1, 22) = 0.913, p = .35
Physical Activity	-.200	.209	-.200		
Quadratic				.294	F(2, 21) = 4.366, p = .03
Physical Activity	-.164	.184	-.164		
Physical Activity	-.626	.228	-.505**		
Cubic				.314	F(3, 20) = 3.055, p = .05
Physical Activity	-.451	.414	-.451		
Physical Activity	-.632	.230	-.510**		
Physical Activity	.205	.265	.321		

** p < .01

Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 29

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 15

Function	B	SE B	β	R^2	F
Linear				.410	$F(1, 22) = 15.269, p = .00$
Physical Activity	.640	.164	.640**		
Quadratic				.410	$F(2, 21) = 7.307, p = .00$
Physical Activity	.643	.169	.643**		
Physical Activity	-.034	.223	-.026		
Cubic				.422	$F(3, 20) = 4.863, p = .01$
Physical Activity	.905	.450	.905*		
Physical Activity	-.021	.227	-.016		
Physical Activity	-.198	.315	-.284		

** $p < .01$

Note. Individual t-tests indicated that the line was best described by a linear function.

Table 30

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 21

Function	B	SE B	β	R^2	F
Linear				.172	F(1, 22) = 4.58, p = .04
Physical Activity	.415	.194	.415*		
Quadratic				.172	F(2, 21) = 2.189, p = .14
Physical Activity	.432	.281	.432		
Physical Activity	-.026	.303	-.024		
Cubic				.185	F(3, 20) = 1.512, p = .24
Physical Activity	-.026	.880	-.026		
Physical Activity	-.091	.330	-.085		
Physical Activity	.310	.564	.515		

* p < .05

Table 31

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 25

Function	B	SE B	β	R^2	F
Linear				.213	F(1, 21) = 5.700, p = .03
Physical Activity	.459	.192	.462*		
Quadratic				.656	F(2, 20) = 7.555, p = .00
Physical Activity	.250	.194	.252		
Physical Activity	-.620	.225	-.511**		
Cubic				.441	F(3, 20) = 4.995, p = .01
Physical Activity	.005	.449	.005		
Physical Activity	-.586	.236	-.483*		
Physical Activity	.179	.298	.279		

* p < .05, ** p < .01
Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 32

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 26

Function	B	SE B	β	R^2	F
Linear				.077	$F(1, 22) = 1.840, p = .19$
Physical Activity	.278	.205	.278		
Quadratic				.312	$F(2, 21) = 4.767, p = .02$
Physical Activity	.077	.196	.077		
Physical Activity	.586	.219	.525**		
Cubic				.323	$F(3, 20) = 3.184, p = .05$
Physical Activity	.326	.481	.326		
Physical Activity	.602	.224	.539**		
Physical Activity	-.164	.288	-.275		

** $p < .01$

Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 33

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 32

Function	B	SE B	β	R^2	F
Linear				.226	F(1, 18) = 5.268, p = .03
Physical Activity	-.476	.207	-.476*		
Quadratic				.299	F(2, 17) = 3.624, p = .05
Physical Activity	-.495	.204	-.495*		
Physical Activity	-.369	.278	-.270		
Cubic				.310	F(3, 16) = 2.399, p = .11
Physical Activity	-.714	.476	-.714		
Physical Activity	-.361	.285	-.264		
Physical Activity	.171	.334	.244		

* p < .05
Note. Individual t-tests indicated that the line was best described by a linear function.

Table 34

Regression Curve Estimation for Variability in Positive Affect and Physical Activity (kcals/4hr) for Participant 36

Function	B	SE B	β	R^2	F
Linear				.110	F(1, 22) = 2.728, p = .11
Physical Activity	.332	.201	.332		
Quadratic				.264	F(2, 21) = 3.770, p = .04
Physical Activity	.235	.193	.235		
Physical Activity	-.562	.269	-.404*		
Cubic				.326	F(3, 20) = 3.226, p = .04
Physical Activity	.697	.389	.697		
Physical Activity	-.627	.268	-.450*		
Physical Activity	-.373	.275	-.536		

* p < .05
Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 35

Regression Curve Estimation for Variability in Negative Affect and Physical Activity (kcals/4hr) for Participant 2

Function	B	SE B	β	R^2	F
Linear				.032	$F(1, 22) = 0.733, p = .40$
Physical Activity	.172	.201	.180		
Quadratic				.287	$F(2, 21) = 4.220, p = .03$
Physical Activity	-.175	.217	-.183		
Physical Activity	.485	.177	.621*		
Cubic				.298	$F(3, 20) = 2.836, p = .06$
Physical Activity	-.300	.309	-.313		
Physical Activity	.321	.334	.412		
Physical Activity	.115	.199	.323		

* $p < .05$
Note. Individual t-tests indicated that the line was best described by a quadratic function.

Table 36

Regression Curve Estimation for Variability in Negative Affect and Physical Activity (kcals/4hr) for Participant 9

Function	B	SE B	β	R^2	F
Linear				.138	F(1,22) = 3.520, p = .07
Physical Activity	.371	.198	.371		
Quadratic				.292	F(2, 21) = 4.336, p = .03
Physical Activity	.106	.222	.106		
Physical Activity	.594	.278	.474*		
Cubic				.296	F(3, 20) = 2.808, p = .07
Physical Activity	.298	.608	.298		
Physical Activity	.653	.332	.521		
Physical Activity	-.158	.462	-.231		

* $p < .05$

Table 37

Regression Curve Estimation for Variability in Negative Affect and Physical Activity (kcals/4hr) for Participant 15

Function	B	SE B	β	R^2	F
Linear				.186	F(1, 22) = 5.033, p = .04
Physical Activity	-.431	.192	-.431*		
Quadratic				.296	F(2, 21) = 4.419, p = .02
Physical Activity	-.472	.184	-.472*		
Physical Activity	.441	.243	.334		
Cubic				.297	F(3, 20) = 2.811, p = .07
Physical Activity	-.519	.496	-.519		
Physical Activity	.438	.250	.332		
Physical Activity	.036	.347	.051		

* $p < .05$
Note. Individual t-tests indicated that the line was best described by a linear function.

Table 38

Regression Curve Estimation for Variability in Negative Affect and Physical Activity (kcals/4hr) for Participant 16

Function	B	SE B	β	R^2	F
Linear				.353	F(1, 22) = 12.023, p = .00
Physical Activity	-.594	.171	-.594**		
Quadratic				.356	F(2, 21) = 5.792, p = .01
Physical Activity	-.575	.189	-.575**		
Physical Activity	-.057	.215	-.050		
Cubic				.359	F(3, 20) = 3.732, p = .03
Physical Activity	-.447	.437	-.447		
Physical Activity	-.047	.221	-.041		
Physical Activity	-.086	.263	-.145		

** $p < .01$

Note. Individual t-tests indicated that the line was best described by a linear function.

Table 39

Descriptive Statistics for Group-Level Study Variables by Study Day (N = 37)

Variable	Study Day	Mean Daily Total	Standard Deviation	Range
Positive Affect				
	Monday	108.77	29.95	46 – 177.65
	Tuesday	107.19	33.92	23 - 192
	Wednesday	105.45	28.81	40 - 176
	Thursday	107.31	32.75	47 - 188
	Friday	104.71	34.39	45 - 180
	Saturday	105.08	30.78	44 – 178.80
Negative Affect				
	Monday	50.21	16.58	40 - 131
	Tuesday	46.40	12.59	14 - 99
	Wednesday	45.26	6.10	40 - 67
	Thursday	45.94	8.31	40 - 76
	Friday	45.69	7.25	40 - 73
	Saturday	44.73	5.56	40 – 60
Physical Activity				
	Monday	1739.01	612.56	921 – 4149.55
	Tuesday	1702.12	502.32	649.47 – 2897.03
	Wednesday	1684.09	608.90	544.57 – 3346.56
	Thursday	1735.27	573.92	898.99 – 3050.65
	Friday	1866.34	652.74	892.82 – 3603.10
	Saturday	1819.34	812.81	172.65 – 3409.72

Table 40

Descriptive Statistics for Group-Level Study Variables by Time of Day (N = 37)

Variable	Time of Day	Mean Daily Total	Standard Deviation	Range
Positive Affect				
	0800	149.96	49.15	79 - 275
	1200	168.75	42.33	87 - 266
	1600	162.78	46.53	80 - 268
	2000	158.62	45.85	75 - 273
Negative Affect				
	0800	69.23	9.21	60 - 93
	1200	71.91	13.36	60 - 126
	1600	70.03	10.91	60 - 102
	2000	68.01	9.75	60 - 99
Physical Activity				
	0800	1900.58	578.03	1156.03 – 3527.92
	1200	3125.94	1023.67	1558.32 – 6119.27
	1600	2985.03	1072.92	1262.22 – 5289.92
	2000	2634.59	823.57	1307.66 – 4757.13

Table 41

Descriptive Statistics for Group-Level Study Variables (N = 37) Collapsed Across Study Days (n = 6).

Variable	Mean Daily Total	Standard Deviation	Range
Positive Affect	106.42	29.53	58 – 176.66
Negative Affect	46.37	6.56	40 – 69.00
Physical Activity	1757.69	470.56	914.79 – 2848.71
Uplifts	31.14	16.86	7.20 – 97.83
Hassles	66.05	59.53	0 – 209.00
Positive Social Interactions	5.57	1.89	1.67 – 10.67
Negative Social Interactions	0.35	0.45	0 – 1.67
Temperature	51.06	11.88	35.50 – 78.83
Physical Symptoms	5.94	5.72	0.33 – 27.00

Table 42

Descriptive Statistics for Group-Level Study Variables (N = 37) for All Testing Occasions

Variable	N of Observations	Mean Daily Total	Standard Deviation	Range
Positive Affect	888	26.67	8.84	10 - 49
Negative Affect	888	11.63	3.17	10 - 45
Physical Activity	888	443.59	248.34	175.77 – 2578.09
Uplifts	215	31.29	18.48	0 - 101
Hassles	215	10.70	10.76	0 - 46
Positive Social Interactions	220	5.55	2.56	0 -17
Negative Social Interactions	221	0.35	0.78	0 - 4
Temperature	222	51.06	13.61	24 - 84
Physical Symptoms	220	5.93	6.05	0 - 34

Table 43. Daily Bivariate Correlations for Study Variables (N = 37)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1.MonPA	----	.854**	.849**	.807**	.825**	.721**	.038	.147	.025	-.145	-.327*	-.124	-.212
2. TuePA		----	.852**	.839**	.813**	.762**	.008	.238	-.031	-.206	-.275	-.126	-.185
3. WedPA			----	.858**	.876**	.868**	-.119	-.052	-.086	-.188	-.254	-.080	-.198
4. ThuPA				----	.921**	.846**	-.062	.031	-.046	-.324	-.364*	-.222	-.231
5. FriPA					----	.857**	-.135	-.030	-.024	-.121	-.291	-.154	-.208
6. SatPA						----	-.154	-.118	-.242	-.287	-.270	-.234	-.165
7. MonNA							----	.803**	.318	.143	.124	.123	-.101
8. TueNA								----	.450*	.246	.220	.224	-.207
9. WedNA									----.	386*	.124	.241	-.172
10. ThuNA										----	.552*	.562*	.187
11. FriNA											----	.738**	.117
12. SatNA												----	.159
13. MonPhy													----
14. TuePhy													
15. WedPhy													
16. ThuPhy													
17. FriPhy													
18. SatPhy													

Cont'd Table 43. Daily Bivariate Correlations for Study Variables (N = 37)

Variable	14	15	16	17	18
1.MonPA	-.162	-.138	-.241	-.219	-.263
2. TuePA	.028	-.205	-.239	-.137	-.198
3. WedPA	-.117	-.059	-.173	-.122	-.176
4. ThuPA	-.138	-.173	-.221	-.134	-.153
5. FriPA	-.069	-.065	-.156	-.083	-.107
6. SatPA	-.094	-.053	-.121	-.163	.038
7. MonNA	.013	-.116	.052	-.165	-.147
8. TueNA	.112	-.365*	-.118	-.210	-.202
9. WedNA	-.075	-.100	-.019	-.042	-.269
10. ThuNA	.186	.106	-.020	-.008	-.014
11. FriNA	.265	-.062	-.119	.135	.169
12. SatNA	.298	-.025	-.126	.098	.029
13. MonPhy	.601**	.637**	.549**	.364*	.474**
14. TuePhy	----	.334*	.351**	.386*	.596**
15. WedPhy		----	.594**	.438**	.483**
16. ThuPhy			----	.520**	.423**
17. FriPhy				----	.369*
18. SatPhy					----

Table 44

Time of Day Bivariate Correlations for Study Variables (N = 37)

	1	2	3	4	5	6	7	8	9	10	11	12
1. 0800 hr PA	----	.824**	.832**	.858**	-.207	-.253	-.262	-.310	-.145	-.195	-.206	-.200
2. 1200 hr PA		----	.951**	.905**	-.200	-.137	-.133	-.183	-.239	.111	-.099	-.181
3. 1600 hr PA			----	.954**	-.226	-.099	-.098	-.167	-.306	-.043	-.200	-.258
4. 2000 hr PA				----	-.158	-.040	-.054	-.106	-.297	-.119	-.191	-.247
5. 0800 hr NA					----	.682**	.629**	.749**	-.015	-.150	.035	.078
6. 1200 hr NA						----	.877**	.766**	-.013	-.228	-.047	.026
7.1600 hr NA							----	.746**	.096	-.097	.019	.201
8. 2000 hr NA								----	-.258	-.286	-.158	-.046
9. 0800 hr Phy									----	.372*	.341*	.516**
10. 1200 hr Phy										----	.654**	.489**
11. 1600 hr Phy											----	.692**
12. 2000 hr Phy												----

Table 45

Bivariate Correlations between Study Variables using Mean Study Week Totals (N = 37)

Variable	1	2	3	4	5	6	7	8	9
1. PA	----	-.161	-.212	.219	-.398**	.101	-.320	-.121	-.296
2. NA		----	-.097	-.059	.305	.297	.362*	-.408*	.098
3. Phys Activity			----	.128	.522**	.127	.344*	.273	.360*
4. Uplifts				----	.130	.338*	.172	-.090	.182
5. Hassles					----	.314	.554**	-.026	.457**
6. Pos Social						----	.281	-.233	.359*
7. Neg Social							----	.050	.029
8. Temperature								----	-.112
9. Phys Symptoms									----

Table 46

Path analysis results for Early-Late Model for positive affect and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
LatePhyAct ← EarlyPA	-1.739	2.232	-0.118	-0.779
LatePA ← EarlyPA	1.09	0.125	-0.008	8.735**
LatePA ← EarlyPhyAct	-0.001	0.005	0.951	-0.098
LatePhyAct ← EarlyPhyAct	0.747	0.210	0.931	3.547**
MonPA ← EarlyPA	1.00	-----	0.908	----
TuePA← EarlyPA	1.139	0.125	0.912	9.091**
WedPA ← EarlyPA	0.999	0.101	0.943	9.852**
ThuPA ← LatePA	1.00	----	0.953	----
FriPA ← LatePA	1.060	0.078	0.962	13.523**
SatPA ← Late PA	0.882	0.089	0.895	9.862**
MonPhyAct ← EarlyPhyAct	1.00	----	0.817	----
TuePhyAct ← EarlyPhyAct	0.663	0.172	0.661	3.857**
WedPhyAct ← EarlyPhyAct	0.902	0.207	0.741	4.362**
ThuPhyAct ←LatePhyAct	1.00	----		----
FriPhyAct ← LatePhyAct	0.919	0.294	0.565	3.129**
SatPhyAct ← LatePhyAct	1.406	0.406	0.694	3.459**

χ^2 (DF = 48, N = 37) = 62.70; CFI>0.95; TLI = 0.94; RMSEA = 0.09; ** $p < .01$

Table 47

Path analysis results for Early-Late Model for negative affect and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
LatePhyAct ← EarlyNA	-0.197	5.309	-0.006	-0.037
LateNA ← EarlyNA	0.139	0.080	0.311	1.733
LateNA ← EarlyPhyAct	0.003	0.002	0.262	1.251
LatePhyAct ← EarlyPhyAct	0.807	0.219	0.934	3.685**
MonNA ← EarlyNA	1.00	-----	0.741	----
TueNA← EarlyNA	1.117	0.286	1.089	3.906**
WedNA ← EarlyNA	0.197	0.077	0.397	2.573**
ThuNA ← LateNA	1.00	----	0.661	----
FriNA ← LateNA	1.100	0.271	0.834	4.054**
SatNA ← Late NA	0.886	0.223	0.876	3.974**
MonPhyAct ← EarlyPhyAct	1.00	----	0.821	----
TuePhyAct ← EarlyPhyAct	0.629	0.171	0.629	3.680**
WedPhyAct ← EarlyPhyAct	0.922	0.216	0.762	4.280**
ThuPhyAct ←LatePhyAct	1.00	----	0.758	----
FriPhyAct ← LatePhyAct	0.874	0.270	0.582	3.234**
SatPhyAct ← LatePhyAct	1.197	0.374	0.640	3.205**

χ^2 (DF = 48, N = 37) = 58.77; CFI = 0.935; TLI = 0.911; RMSEA = 0.08; ***p* < .01

Table 48

Path analysis results for Early-Mid-Late Model for positive affect and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
MidPA ← EarlyPA	0.942	0.111	0.963	8.517**
MidPhyAct ← EarlyPA	-2.514	2.949	-0.141	-0.852
MidPA ← EarlyPhyAct	-0.004	0.005	-0.070	-0.787
MidPhyAct ← EarlyPhyAct	0.770	0.223	0.789	3.451**
LatePhyAct← MidPA	-658.740	26704.355	-52.054	-0.025
LatePA ←MidPA	-50.332	2079.438	-41.253	-0.024
LatePA ← MidPhyAct	1.074	42.529	16.056	0.025
LatePhyAct ← MidPhyAct	13.929	546.210	20.072	0.026
LatePA ← EarlyPA	51.207	2065.106	42.886	0.025
LatePhyAct ← EarlyPA	653.459	26520.407	52.765	0.025
LatePhyAct ←EarlyPhyAct	-12.587	519.939	-18.570	-0.024
LatePA ← EarlyPhyAct	-1.018	40.482	-15.579	-0.025

χ^2 (D = 38, N = 37) = 51.89; CFI>0.95; TLI = 0.939; RMSEA = 0.096; ***p*<.01

Table 49

Path analysis results for Early-Mid-Late Model for negative affect and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
MidPA ← EarlyNA	0.060	0.042	0.166	1.427
MidPhyAct ← EarlyNA	-13.894	6.162	-0.214	-2.255*
MidNA ← EarlyPhyAct	0.001	0.001	0.219	0.914
MidPhyAct ← EarlyPhyAct	0.822	0.233	0.755	3.530**
LatePhyAct← MidNA	-35.858	30.761	-0.283	-1.166
LateNA ←MidNA	1.449	0.704	0.660	2.060*
LateNA ← MidPhyAct	-0.009	0.006	-0.716	-1.480
LatePhyAct ← MidPhyAct	0.294	0.310	0.412	0.946
LateNA ← EarlyNA	-0.113	0.089	-0.141	0.201
LatePhyAct ← EarlyNA	1.255	3.979	0.027	0.315
LatePhyAct ←EarlyPhyAct	0.568	0.367	0.731	1.548
LateNA ← EarlyPhyAct	0.010	0.006	0.713	1.480

χ^2 (DF = 38, N = 37) = 51.89; CFI>0.95; TLI = 0.939; RMSEA = 0.096; **p*<.05, ***p*<.01

Table 50

Path analysis results for daily hassles and uplifts relations to daily positive affect and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
PA ← Hassles	-0.213	0.073	-0.422	-2.904**
PhysAct ← Hassles	4.065	1.130	0.516	3.596**
PhysAct ←Uplifts	1.699	3.991	0.061	0.426
PA ← Uplifts	0.481	0.259	0.271	1.861

χ^2 (DF = 1, N = 37) = 0.616; CFI>0.95; TLI = 1.147; RMSEA = 0.00; ***p*<.01

Table 51

Path analysis results for daily hassles and uplifts relations to daily negative and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
NA ← Hassles	0.035	0.018	0.317	1.997*
PhysAct ← Hassles	4.065	1.130	0.516	3.596**
PhysAct ←Uplifts	1.699	3.991	0.061	0.426
NA ← Uplifts	0.039	0.062	-0.100	-0.629

χ^2 (DF = 1, N = 370) = 0.616; CFI>0.95; TLI = 1.167; RMSEA = 0.00; *p< .05, **p<.01

Table 52

Path analysis results for daily positive and negative social interaction relations to daily positive affect and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
PhysAct ← Social Negative	346.970	169.069	0.336	2.052*
PA ← Social Positive	3.239	2.507	0.203	1.292
PA ← Social Negative	-24.659	10.471	-0.371	-2.355*
PhysAct ← Social Positive	8.229	40.482	0.033	0.203

χ^2 (DF = 1, N = 37) = 2.972; CFI = 0.742; TLI = -0.549; RMSEA = 0.234; ***p*<.01

Table 53

Path analysis results for daily positive and negative social interaction relations to daily negative affect and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
PhysAct ← Social Negative	346.970	169.069	0.336	2.052*
NA ← Social Positive	0.736	0.547	0.216	1.344
NA ←Social Negative	4.369	2.286	0.308	1.911
PhysAct ← Social Positive	8.229	40.482	0.033	0.203

χ^2 (DF = 1, N = 37) = 2.972; CFI = 0.821; TLI = -0.075; RMSEA = 0.234; *p < .05**p<.01

Table 54

Path analysis results for daily temperature (^{o}F) and physical symptom relations to daily positive affect and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
PA ← Temperature	-0.387	0.393	-0.155	-0.986
PhysAct ← Temperature	12.591	5.831	0.314	2.159*
PA← Physical Sympt.	-1.618	0.817	-0.312	-1.982*
PhysAct ← Physical Sympt.	32.579	12.115	0.390	2.689**

χ^2 (DF = 1, N = 37) = 0.457; CFI>0.95; TLI = 1.394; RMSEA = 0.00; *p < ., 05**p<.01

Table 55

Path analysis results for daily temperature (^{o}F) and physical symptom relations to daily negative affect and physical activity

	Unstandardized		Standardized	Critical
	MLE	SE	MLE	Ratio
NA ← Temperature	-0.222	0.084	-0.403	-2.632**
PhysAct ← Temperature	12.591	5.831	0.314	2.159*
NA← Physical Sympt.	0.061	0.175	0.053	0.346
PhysAct ← Physical Sympt.	32.579	12.115	0.390	2.689**

χ^2 (DF = 1, N = 37) = 0.457; CFI>0.95; TLI = 1.394; RMSEA = 0.00; *p < .05, **p<.01

Figure 1. Example Participant 4 (N_{obs} = 24) Regression Curve Estimation Results for Positive Affect and Physical Activity.

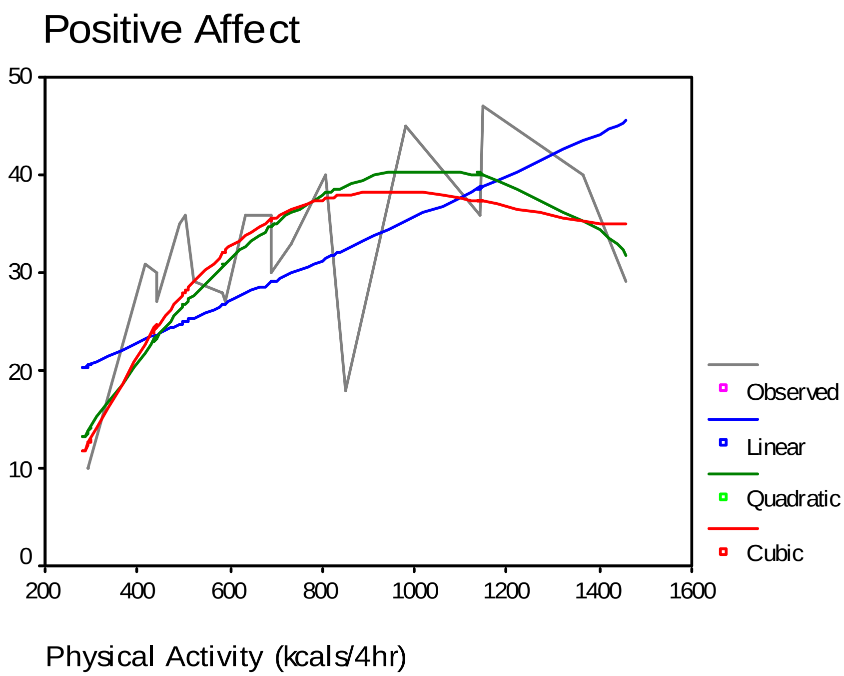


Figure 2. Example Participant 2 (N_{obs} = 24) Regression Curve Estimation Results for Positive Affect and Physical Activity.

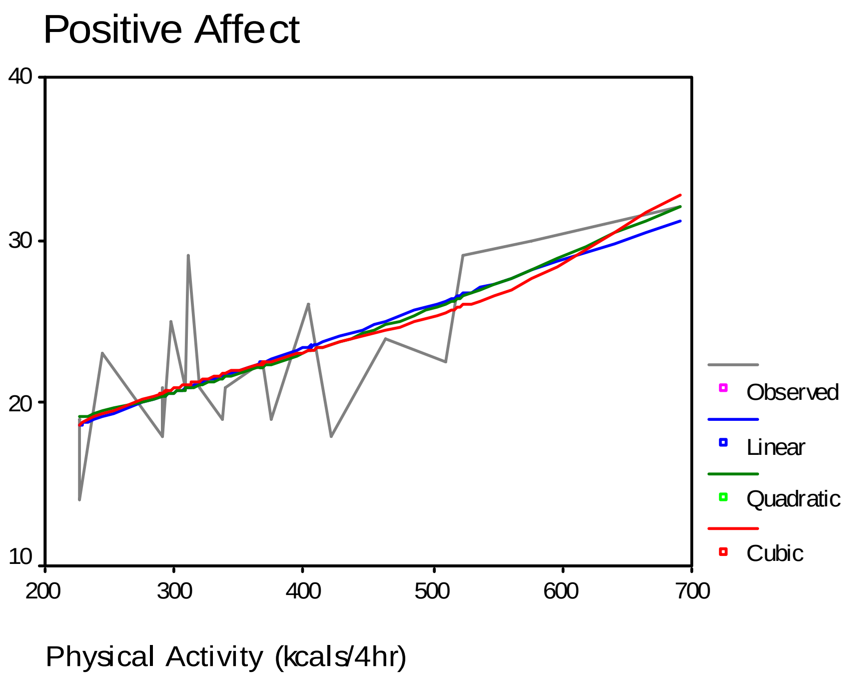


Figure 3. Group Level Means on Positive Affect by Study Day (N = 37)

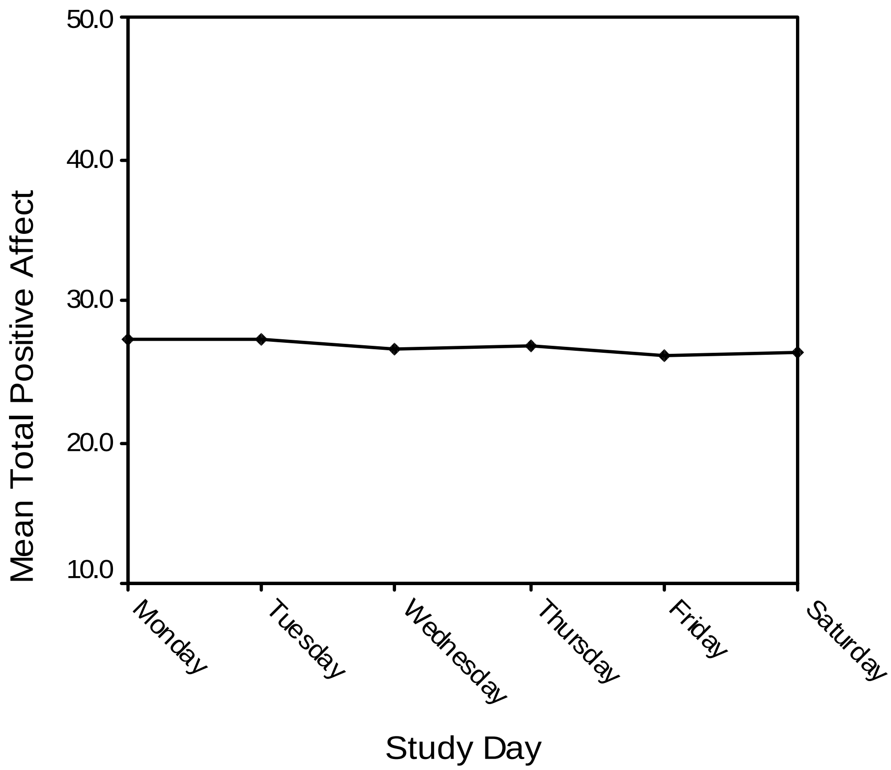


Figure 4. Group Level Means for Negative Affect by Study Day (N = 37)

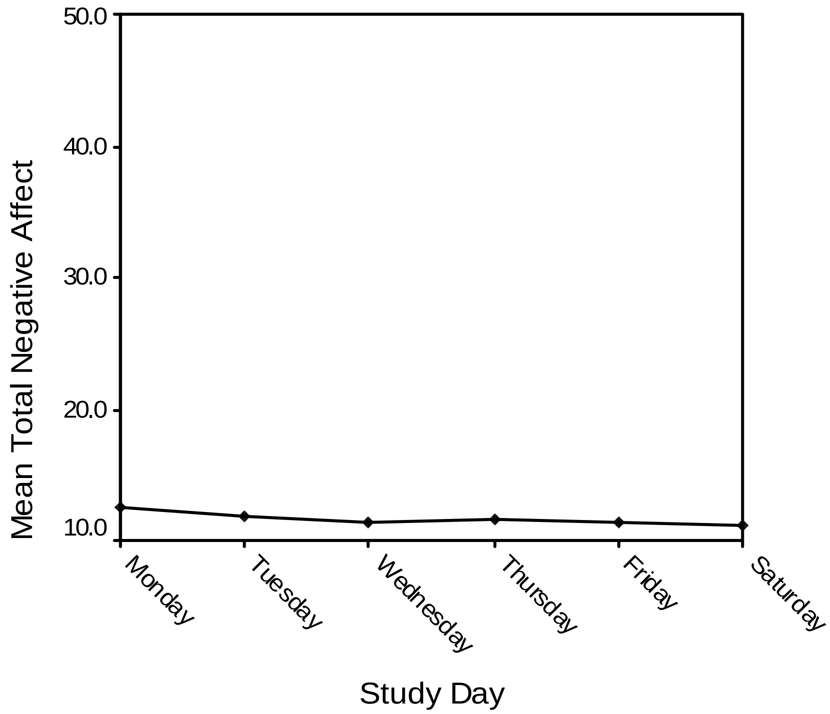


Figure 5. Group Level Means for Physical Activity by Study Day (N = 37)

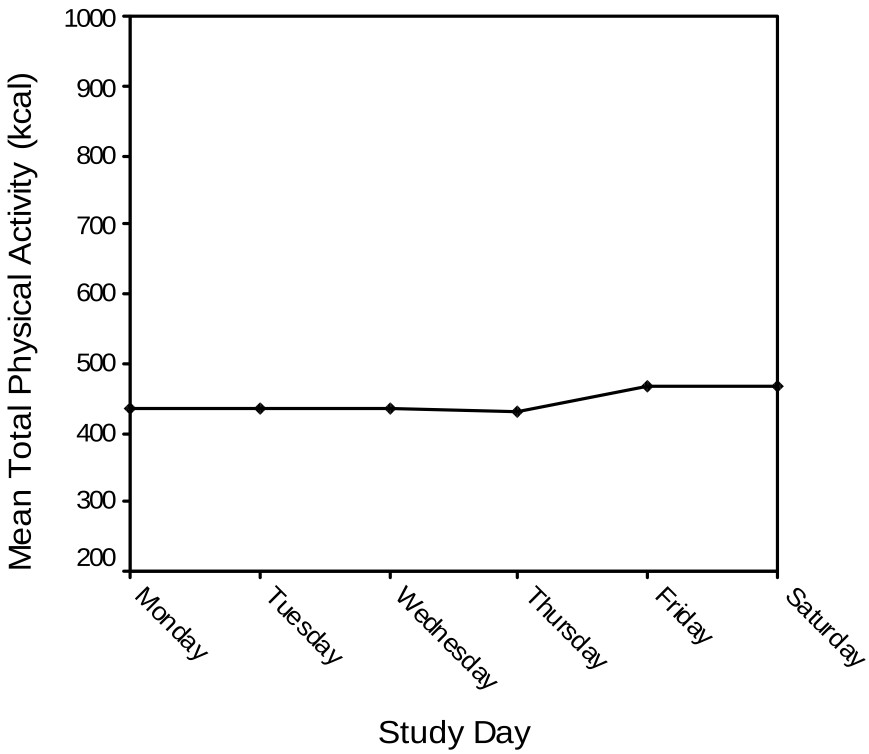


Figure 6. Group Level Means for Positive Affect by Time of Day (N = 37)

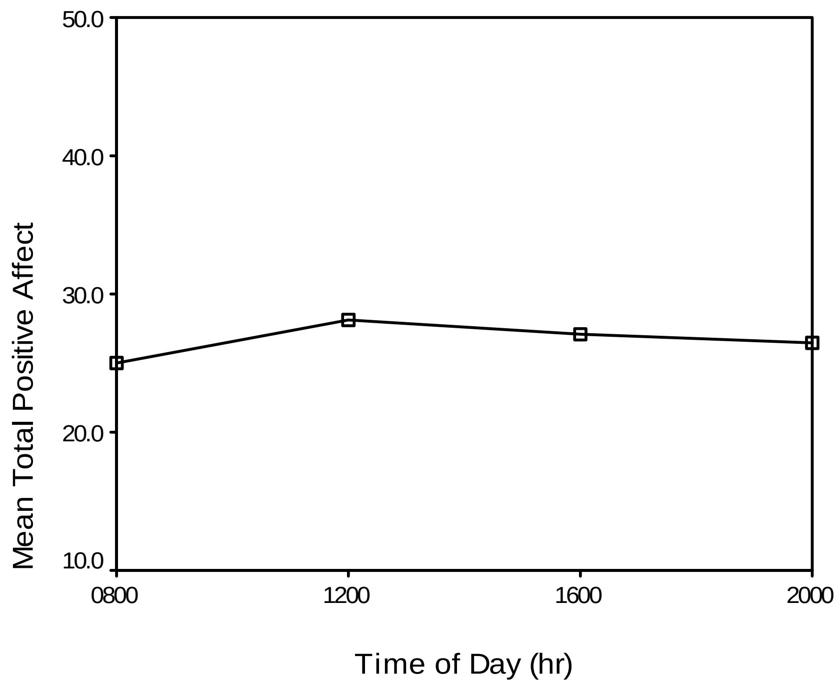


Figure 7. Group Level Means for Negative Affect by Time of Day (N = 37)

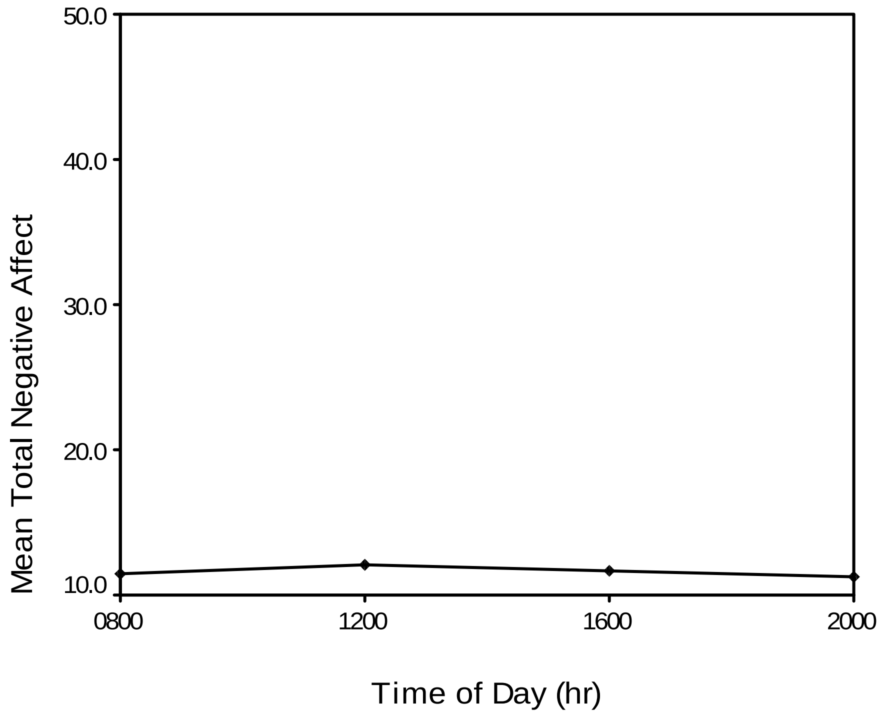
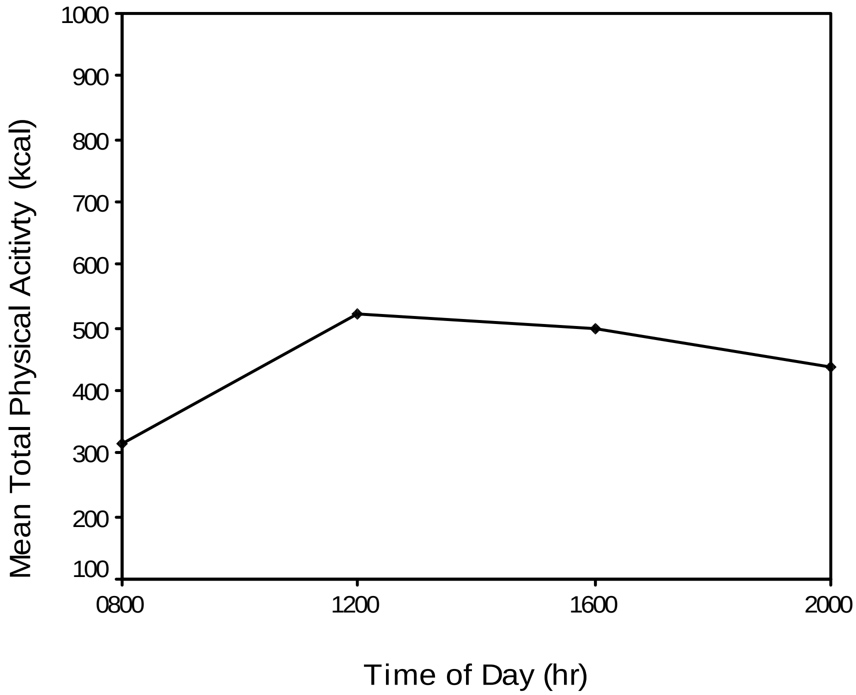


Figure 8. Group Level Means for Physical Activity by Time of Day (N = 37)



Appendix A

Example Participant Calculation of RMR using Harris-Benedict Equation

1. Harris-Benedict Equation for Females:

   RMR = 655 + (9.6 x W) + (1.7 x H) – (4.7 x A)

   Where weight is in kg (lbs/2.2)

   Where height is in cm (inches x 2.54)

2. Example Participant:

   - Weight = 155 lbs
   - Height = 66 inches
   - Age = 73

3. Example Calculation:

   655 + (9.6 x 70.45) + (1.7 x 167.64) – (4.7 x 73) = **1273.208 kcals/day**

4. RMR – or energy expenditure at rest over a 4hr period:

   1273.208 / 6 = **212.20 kcals/4hr**

Appendix B

Example of Total Energy Expenditure (TEE) over a 4 hr period

1. The nine activity questions on the Physical Activity Scale are in the following MET value order: .9, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0, +6.0
2. In order to calculate energy above rest, only activities with MET values greater than or equal to 1.5 will be included.
2. Respondents could estimate the following amount of time spent in each activity: 15min, 30min, 45min, 1hr, 2hr, 3hr
3. 1 MET = 3.5 ml O2/kg/min
4. You burn about 5 kcals per L of O2
5. <u>Example Participant:</u> <u>Example Physical Activity from 8am-12:</u>

a. Weight = 155 lbs, 70.45kg	1.5 MET for 45min
b. Height = 67 inches	2.0 MET for 15 min
c. Age = 73	
d. RMR = 212.20 kcals/4hr	

6. <u>TEE over a 4hr period</u>

a. <u>1.5 MET for 45 min</u>

1.5 MET x 3.5 mlO2/kg/min = 5.25 ml O2/kg/min

5.25 ml 02/kg/min x 70.45 kg = 369.86 ml O2/min

369.86ml = .36986 L

.36986 L x 5 kcals = 1.8493 kcal/min

1.8493 kcal/min x 45 min = **83.22 Kcals**

b. 2.0 MET for 15 min

2.0 MET x 3.5ml O2/kg/min = 7.0 ml 02/kg/min

7.0 ml O2/kg/min x 70.45 kg = 493.15 ml O2/min

493.15ml = .49315 L

.49315 L x 5 kcals = 2.466 kcal/min

2.466 kcal/min x 15 = **36.99 Kcals**

Total Energy Expenditure from 8-12pm on Monday

83.22 kcals + 36.99 kcals + (RMR for time not in activity (3hr) = 159.15) =

279.36 TEE from 8am to 12pm for Participant X.

Table 1. Chart of study measurements in order of protocol administration

Protocol Administer	Name, Author, and Date	What the Measure Assesses	Items and Reliability	Appendix Page
Recruitment	----	Recruitment Ad	----	Appendix C
Screening	Community Healthy Activities Model Program for Seniors (CHAMPS) Stewart et al., 1997, 2001	This measure assesses physical activities endorsed by older adults. Participant indicates if they have done the activity in the past 4 weeks, how many times a week, and how many hours per a week.	* 41 items * 6-month test-retest reliability was r = .63 - .65	Proprietary
Screening	Screening Script and Items	This brief screener assesses whether or not the participant can hear a Palm Pilot© beep, read newspaper font, and do not work jobs that do not have regular, daytime hours.	* 3 items	Appendix D
Baseline	-----	Informed Consent	-----	Appendix E
Baseline	Demographics	Age, marital and living status, education, income, weight, etc.	*9 items	Appendix F
Baseline	NEO-PI-R form S Costa & McCrae, 1992	This measure assesses personality traits, such as extraversion and neuroticism.	* 60 items * Reliability for Neuroticism = .88 Extraversion = .80	Proprietary
Baseline	Life Orientation Test (LOT) Scheier, Carver, & Bridges, 1994	This measure assesses global optimism.	*10 items *Reliability = .78 with 4-mo = .68	Proprietary
Baseline	Geriatric Depression Scale (GDS) Arthur, Jagger, Lindesay, Graham, & Clark, 1999	This measure assesses level of clinical depression.	* 15 items * Reliably detects clinical depression among older adults.	Proprietary
Baseline	National Long-term Care Study (NLTCS) measure of Functional Ability LTCS, 1999	This measure assesses basic and instrumental activities of daily living.	*10 items * Reliable in large samples of older adults.	Proprietary
Baseline	Instrumental Activities of Daily Living Lawton & Brody, 1969	This measure assesses degree of ability to perform instrumental activities of daily living.	* 9 items * α = .91	Proprietary
Baseline	Self-rated Health (Lawton, 1982; NLTCS)	This measures perceived health	* 1 item * α = .76	Proprietary
Baseline	Medical Conditions (NLTCS, 1999)	This measure assesses whether or not an individual currently has a medical condition and when it was diagnosed	* 21 items	Proprietary
Baseline	Social Support Questionnaire – Short Form (Sarason, Sarason, Shearin, & Pierce, 1987)	This measure assesses the number of individuals in the social support network, relation of the network members to the a participant, and overall satisfaction with support on a 6-point Likert scale. Two additional items were added for diet and exercise.	*8 items * α = .90	Proprietary

Protocol Administer	Name, Author, and Date	What the Measure Assesses	Items and Reliability	Appendix Page
Baseline	Baseline Physical Assessment and Training – Pedometer, Gait, Weight, Height, Waist Circumference, Grip Strength, and Palm Pilot© Assessment	This provides a script of how the participant was trained to use the pedometers and the Palm Pilot©. Additionally, questions will assess gait (see Li, Aggen, Nesselroade, & Baltes, 2002) Questions to assess grip strength was taken from the National Institute on Aging Women's Health Study Height, weight, and waist circumference was taken with a digital scale and measuring tape.	* 4 items for gait * 3 items for training * 1 item each for height, weight, and waist circumference * 10 items	Appendix G
Baseline	Study reference sheets	These are all the reference sheets for participants to help remind them how to do the study	-----	Appendix H
Daily Palm	Positive and Negative Affect Schedule (PANAS) Watson, Clark, & Tellegen, 1988.	This measure assesses 10 positive and 10 negative affect words on a degree of intensity (not at all to extremely).	* 20 items * Split-half reliability for Negative = .78 Positive = .87	Appendix I
Daily Palm	Physical Activity Scale (PAS) Aadahl & Jorgensen, 2003	This measure assesses daily physical activities on a nine degree scale from sleep/rest to vigorous/running, as well as the time in the activities. Originally made to assess over 24 hours, it is adjusted for the current study to recall over the past 4 hours.	* 9 items * concurrent validity with daily diary, r = .74	Appendix J
Daily Palm	Daily Stress and Social Interaction	A single item was ask the extent to which the participant feels stressed. Additionally, participants was asked if anyone else was currently around them and the time spent in the previous 4 hours interacting with family and/or friends.	* 3 items	Appendix K
End of Day	Health Items	Participant was asked about sleep patterns, eating habits, cigarette, and alcohol use.	* 10 items	Appendix L
End of Day	Social exchanges Rook, 2001	Participants will be asked about positive and negative social exchanges that occurred.	* 20 items * Reliability for Positive = .85 Negative = .81	Proprietary
End of Day	Hassles and Uplifts Scale (HUS) Delongis, Folkman, & Lazarus, 1988	This measure assesses the extent to which many daily life domains were a hassle and an uplift.	* 53 items * Test-retest reliability r = .79	Proprietary
End of Day	PILL Pennebaker,	This measure assesses whether or not physical symptoms were present during	* 54 items * Reliable and	Proprietary

		the day	predicts doc visits.	
Protocol Administer	**Name, Author, and Date**	**What the Measure Assesses**	**Items and Reliability**	**Appendix Page**
End of Day	Recall of the Day	This open-ended format helped the investigator determine the order of daily events as they occurred.	* Open ended	Appendix M
Midweek	Mid-week Contact Sheet	This sheet was used to ask how the participant is doing in the study at mid-week	* 6 items	Appendix N
Post Study	Participant Thoughts	This brief measurement was used to assess what the participant thought about the study	*10 items	Appendix O
Post Study	Medicine Label Check	This measurement collects information on participant medications	* 7 items per prescribed medication	Appendix P

Appendix C

Recruitment Ad

Women Participants Needed for a Dissertation Research Study at West Virginia University

Jenessa Johnson, M.A., a doctoral graduate student in the Department of Psychology at West Virginia University is looking for 50 women over the age of 55 to participate in her dissertation study entitled:

"Understanding the Daily Lives of Community-Dwelling Older Women"

Study Purpose

The purpose of this research study is to gain an understanding of the social, physical, and psychological daily lives of older women. The study will train participants to use hand-held computers (i.e., Palm Pilots©), pedometers, and short daily journals to collect data throughout the day. Example information to be collected includes the physical activities, social interactions, and psychological factors (e.g., stress, mood) affecting life over the course of a day. Participants will be part of the study for one week.

First, participants will attend a baseline assessment and training session to last approximately 60-90 minutes. **Second,** participants will take home the Palm Pilot©, pedometer, and daily journal to answer study questions for six days.

Incentives

1. Earn $10.00 after completing the training session.
2. Enter a raffle for a chance to win one of two Palm Pilots© or one of two pedometers.

Contact Information

Please contact Jenessa Johnson directly at **(304) 685-4631** or leave a message at **(304) 293-2001.**

Appendix D – Screening Items
Initial Contact
(Group Organization Presentation or Telephone Self-referral)

The study introduction might take place over the phone or in a group setting. The purpose of this study component is to provide the potential participant(s) an overview of the study. First, the primary investigator (PI) will introduce herself and tell the potential participant(s) where she is from (i.e., WVU). Then, the PI will read the following information

I am talking with you today, because I wanted to tell you about an exciting new study that I am doing as part of my doctoral dissertation. The purpose of this study is to gain an understanding of how women over age 55 live their daily lives. Previous research has not tried to look at women and their day-to-day activities in the new way that this study will. As a potential participant in this study, you are very important to the understanding of what women physically do, whom they interact with, and how they feel on a daily basis. In addition, this study will provide use of a new technology in gathering your information. Most of your information will be collected with use of a Palm Pilot©. [If in a group, the PI will show the participants the Palm Pilot©]. However, before you start using the Palm Pilot©, you will be asked to attend a group session or a session at your home (at your preference), where you will learn about how to use the Palm Pilot©. At this session, you will also be asked to fill out some questionnaires and learn how to use a pedometer. A pedometer is a small electronic device that you wear on your hip that measures the steps you take throughout a day. This group session will take approximately 1 ½ hours. Snacks and drinks will be provided at this session. You will also receive $5.00 for attending this session. At the end of the group session, you will be ready to take your Palm Pilot©, pedometer, and daily journal home to start the study. The study will last for 6 days in a row. Each day, the Palm Pilot© will page you four times. You will know when the page is to occur. The Palm Pilot© will ask you some questions about what you have been doing and how you feel. It will take about 3 minutes to answer. At the end of each day, you will fill out your "Daily Journal." This journal provides easy-to-answer questions that will take about 10 to 15 minutes to complete. At the end of the study, a research assistant or myself will visit you to collect all the study materials.

Do you have any questions about the study at this time?

Would you like to be screened to see if you are eligible for the study?
If NO, thank them for their time and interest.
If YES, tell them that they will need to answer a few questions about daily activities to see if they are eligible for the study. It will take about 5 minutes.

ADMINISTER THE CHAMPS AND SCREENING QUESTIONS

Tell the participant whether or not they are eligible for the study and invite her to attend a group session. If screening is in a group, obtain contact information at this time.

If they are not eligible, thank them for their time and ask them if they want to keep their name available for other studies being conducted in our department.

Screening Response Sheet

RID#:__________
Date:____/____/______

1. Location:
___ Telephone
___ Group, where_______________________

2. How did the participant find out about the study?
___ flier
___ newspaper ad
___ recruited directly for organization, name of organization_______________________
___ snowball referral

3. Screening Response:
___NO, Declined
___YES

4a. CHAMPS Administration
____ #2 Activities ____ total per week ____ total hours
____ #3 Activities ____ total per week ____ total hours
____ #4 Activities ____ total per week ____ total hours
____ #5 Activities ____ total per week ____ total hours
____ #6 Activities ____ total per week ____ total hours
____ #7 Activities ____ total per week ____ total hours

4b. **Does the participant NOT do any #2-#7activities totaling 3 times a week (and over 1.5 total hours/wk) across activities? YES NO
If the answer is "NO" to this question, the participant is NOT eligible.

5a. Can participant Hear the beep over the phone or in person?
YES NO

5b. Can the participant Read a newspaper without trouble?
YES NO
If participant cannot hear OR read, they are not eligible.
5c. Is this participant eligible?
YES NO

Session DATE:____/____/_______
Session PLACE:__________________________________

6. Are you currently employed? YES NO
If YES,
  6a. What is you current job title? ___________________
  6b. What days and hours do you typically work? ______________________
  6c. Do you work hours fluctuate on a weekly basis? YES NO

If participant works very early in the morning, late into the evening, overnight, or weekends, they are not eligible. If participant has hours that fluctuate from one week to the next, they are not eligible.

6f. Is this participant eligible? YES NO

<u>If yes to all screening questions (3b, 4c, 5f)</u>, please register them for a baseline session, get their contact information, and provide directions to follow for get an accurate blood pressure reading.:

Baseline Session Scheduled for:

Date:_____________________
Time:_____________________
Place: Home or WVU____

Participant Contact Information:

Name:________________________
Address:______________________
Telephone:_____________________

Blood Pressure Directions:

"In order to obtain an accurate reading of blood pressure, we ask that you please refrain from consuming caffeine, smoking, and vigorous physical activity at least 2 hours before the study session."

Thank You!!!!

Appendix E - Informed Consent

Consent and Information Form

Understanding the Daily Lives of
Community-Dwelling Older Women

Introduction: I, ______________________, have been invited to participate in this research study, which has been explained to me by Jenessa Johnson, M.A.

Purpose of the Study: I have been invited to participate in this study, because I am a community-dwelling woman over the age of 55. The purpose of the study is to learn more about daily psychological and physical well-being among women. There will be approximately 50 women invited to participate in this study.

Procedures: First, I will be asked to complete an initial measurement and training session. At this session, I will fill out a variety of questionnaires and complete physical tests (e.g., weight, blood pressure, etc.) on my physical and mental health. In addition, the primary investigator and her research assistants will train me on how to do the daily study. I will be instructed on how to use the Palm Pilot©, the pedometer, and daily journal. The training session will allow me the opportunity to become comfortable with using the study instruments. This session will take approximately 60 to 90 minutes. Second, I will be asked to do the study for six days (Monday through Saturday). I understand that when the Palm Pilot© pages me four times a day, I will answer questions on the Palm Pilot©. These questions will take about 3 minutes to answer. Third, at the end of each day, I will be asked to answer questions in a daily journal. This will take about 10 minutes.

____

Understanding the Daily Lives of Community-Dwelling Older Women

Procedures (cont'd): Fourth, at the end of the study I will be visited by a research assistant, who will obtain the Palm Pilot©, pedometer and journal information. At this time, I will answer a few more questions regarding my thoughts about the study and some physical health information. This will take approximately 15 minutes. I have been told that I may see the questions that will be asked of me before signing this consent and information form and that I do not have to answer all of the questions during the study if I decide to participate.

Benefits: I understand that this study is not expected to be of direct benefit to me, but the knowledge gained may be of benefit to others.

Risks and Discomfort: There are no known expected risks from participating in this study, except the slight frustration of being paged 4 times a day by the Palm Pilot©. I might also possible experience a little discomfort for a short period of time when gripping a device with my hands or the squeeze of the blood pressure cuff. For each situation, I understand I can refuse to do the task without penalty or loss of benefits.

Financial Considerations: As a token of my participation, I will receive $10.00 at the end of the initial training session. Additionally, I will be entered in a raffle that includes the raffling of two Palm Pilots© and two pedometers. The drawing will occur at the end of the study.

Alternatives: I can choose not to participate in this study.

Contact Persons: For more information about this research, I can contact Ms. Johnson at (304) 293-1606, or her supervisor, Dr. Patrick at (304) 293-2001, ext. 31680. For more questions about my rights as a research participant, I can contact the Executive Secretary of the Institutional Review Board at (304) 293-7073.

Daily Psychological and Physical Well-being among Older Women

Confidentiality: I understand that any information about me obtained as a result of my participation in this research will be kept as confidential as legally possible. I understand also that my research records, just like hospital records, may be subpoenaed by court order or may be inspected by federal regulatory authorities. In any publications that result from this research, neither my name nor any information from which I might be identified will be published without my consent.

Voluntary Participation: My participation in this study is voluntary. I do not have to answer any question I do not want to answer, and I am free to withdraw my consent to participate in this study at any time. Refusal to participate or withdrawal will involve no penalty or loss of benefits. I have been given the opportunity to ask questions about the research, and I have received answers concerning areas I did not understand.

Signatures:

Upon signing this form, I will keep one copy and return the other copy to the principal investigator.

I willingly consent to participate in this research.

__________________________________ ______________ ________
Signature of the Participant Date Time

__________________________________ ______________ ________
Signature of the Principal Investigator Date Time

Appendix F – Demographics

1. Birthdate:	**Month______Day______Year__________**
2. Education:	Please circle the highest level of education you have completed: a. Grade School/High School: 1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th b. Trade/Business/Technical: 1yr 2yr 3yr 4yr 5yr c. College: 1yr 2yr 3yr 4yr 5yr d. Graduate School: 1yr 2yr 3yr 4yr 5yr 6yr
3. Marital Status	What is your marital status? _____ Married (Date of marriage: Month___Date___Year______) _____ Married, but separated (Date of marriage: Month___Date___Year______) _____ Widowed (Date of marriage: Month___Date___Year______) _____ Divorced _____ Single, Never married
4. Work Status	4a. What is your current work status? _____ Retired (Year of Retirement: __________) _____ Retired, but work Part Time (Year of Retirement:______) _____ Work Full-Time _____ Work Part-Time _____ Other: ____ 4b. What kind of work have you done most of your life? ____
5. Living Status	_____ I live with my spouse and no relatives _____ I live with my spouse and relatives (Please name relative(s):_____________________________) _____ I live with a relative(s): (Please name relative(s):_____________________________) _____ I live alone _____ I live with a friend(s):________________________________

6. Income	**What is your total yearly family (household) income: (circle one):** a. Under $4,000 i. $18,000 to $19,999 b. $4,000 to $5,999 j. $20,000 to $21,999 c. $6,000 to $7,999 k. $22,000 to $23,999 d. $8,000 to $9,999 l. $24,000 to $25,999 e. $10,000 to $11,999 m. $26,000 to 27,999 f. $12,000 to $13,999 n. $28,000 to $29,999 g. $14,000 to $15,999 o. $30,000 to $49,999 h. $16,000 to $17,999 p. Over $50,000
7. Children:	How many children do you currently have? ____________________ How many children live close by (less than 60min drive)? ________

8. Height Weight	What is your Height? ______ft. _______in. What is your Weight? ________lbs.
9. Assistive Devices	Do you use a hearing aid? (circle one) YES NO Do you use a walker? YES NO Do you use other assistive devices? YES NO If yes, please specify:________________________________

Appendix G – Baseline Training
(Palm Pilot©, Pedometer, and Physical Assessment)

Baseline Group Session
(if individual, will use same script, but will be in participant homes)

1. Briefly Go Over the Initial Contact Information Again

Tonight, you will be doing several things. First, you will be given an informed consent and a contact information sheet. Second, you will be asked to answer some questionnaires. Third, you will learn how to use the pedometer.. Fourth, you will be trained on how to use the Palm Pilot©. Fifth, you will learn what will be asked in your Daily Journals. Sixth, you will complete some physical assessments. Lastly, will be given your study materials and $5.00. Throughout this time, please feel free to take a break and help yourself to the snacks and drinks provided on the table.

2. Administer and Go Over the Informed Consent

3. Obtain Contact Information

4. Administer the Baseline Questionnaires

What you are being handed now is a packet of questionnaires. These questionnaires will ask you about your (a) background, (b) health, (c) psychological, and (d) social information. Please take the time to answer these questions. We will be walking around to answer any questions you might have about what is being asked. When you are done answering these questions, please move to the Physical Assessment area located: NAME LOCATION.

5. Pedometer Training Procedure:

At the pedometer training, the research assistant will show the participant what a pedometer is and how to properly wear it. The research assistant will demonstrate how to use it on his/her own body and then have the participant to do it. To make sure the pedometer works with the participant's stride, a walking test will be conducted. The participant will be instructed to walk 10 ft at a normal pace and then 10 ft at a faster pace. Each time the pedometer will be checked for accuracy. Also, the walking test will be timed to measure gait. Then, the research assistant will discuss that the pedometer is to be worn from wakeup time to bedtime. The participant is to hit the RESET button after she puts on the pedometer at the beginning of each day. This is the ONLY time in which the RESET button is pressed. Each time the Palm Pilot© pages the participant, he will be instructed to fill out the pedometer steps on a chart. The research assistant will instruct the participant on how to use the chart. Lastly, the research assistant will tell the participant not to hesitate if something goes wrong with the pedometer. The participant will then be given her pedometer and instructed to go to the Palm Pilot© training with the PI.

6. Palm Pilot© and Daily Journal Training Procedure:

This instrument is a Palm Pilot©. It is very simple and easy to use. However, we understand that some of you might not have used one before, so we would like to have you try it out so that you feel comfortable in using the Palm Pilot© before you leave tonight.

At this point, I will give each participant a Palm Pilot© to try. I will go, step-by-step how to use it. I will show them how to turn it on. How to start the experiment, how to tap the screen, what it looks like in-between sessions, etc. Next, the participant will "try" the experiment. Every participant will be asked if they can see the screen okay, if they can hear the beep okay, and if they feel comfortable using the Palm Pilot©. If they respond yes to all three, they will be given their own Palm Pilot© to start the first study session.

The participants will be told what to do in case something goes wrong. They will be shown where my contact information is listed on the Palm Pilot©. They will also be shown how to use the "Error Log Book" and what to do if they can't see the screen or if they lose their stylus.

Next, it will be discussed how often the Palm Pilot© will page the participant.

The Palm Pilot© will page you four times a day, around 4 hours apart. Each time, it will ask you the same questions about how you are feeling and what you have been doing. It will take you about 3 minutes to complete each session. You will do this for 6 days in a row. Also, another way to determine your daily activities is through the use of a pedometer. The pedometer does not store your information, so you will have to write down your steps on a chart after each time you are paged [If in a group, show chart again]. At the end of each day, you will be asked to fill out a Daily Journal [if in a group, show journal]. This journal will take between 10 and 15 minutes to complete. It will ask you additional questions about what you did during the day, how you felt, and with whom you interacted. Please take a look through Monday's journal.

At this point, I will explain how to respond to the various scales. I have provided directions, but this gives me an opportunity to explain to the participant and answer any questions they might have.

Do you have any questions?

<u>5. Physical Assessment:</u>

Here the participant will be asked to be weighed using a scale. Participant height and waist circumference will also be taken with a measuring tape. Lastly, the participant's grip strength will be assessed (see attached questions). After completion, the participant will be thanked and asked to call the PI with any questions they might have throughout the study. The participant will be notified that she will be called at least once throughout the week to see how she is doing with the study. She will also be asked when the research staff should stop by her home at the end of the study to collect her study materials. She will be told that at the last visit, she will be asked a few question about her feelings about the study and some additional health questions. The visit should take approximately 15 minutes. Finally, the participant will receive her $5.00 honorarium.

Appendix H – Study Reference Sheets

These study reference sheets will be attached in the inside jacket of the Palm Pilot© holder.

<u>For Activity/Time Questions:</u>
0 = Did not do at all
15 = less than 15 minutes
30 = about 30 minutes
45 = about 45 minutes
1 = about 1 hour
2 = about 2 hours
3 = 3 or more hours

<u>For Emotion Questions</u>
1 = Not at All
2 = A Little
3 = Moderately
4 = Quite a Bit
5 = Extremely

Pedometer Readings:

	Time 1 (8am)	Time 2 (12pm)	Time 3 (4pm)	Time 4 (8pm)
MON				
TUES				
WED				
THUR				
FRI				
SAT				

Error Log Book

*Please note any errors you made on the Palm Pilot© by pressing the wrong button.

Day (circle): M T W R F S
Time: _______am or pm?
Item Question_______________

____

I wanted my answer to be:

____

____

Day (circle): M T W R F S
Time: _______am or pm?
Item Question_______________

____

I wanted my answer to be:

____

Jenessa's Contact Information

*Please contact immediately if you are having any troubles.
Cell Phone: 685-4631
Home Phone: 265-1608

What to do if:
Lose your stylus?

- **try using the back of a pencil or pen to touch the screen**

Can't see the screen?

- **try moving the dial on the left side of the Palm Pilot©**

Error Log Book

*Please note any errors you made on the Palm Pilot© by pressing the wrong button.

Day (circle): M T W R F S
Time: _______am or pm?
Item Question_______________

____

I wanted my answer to be:

____

____

Day (circle): M T W R F
Time: _______am or pm?
Item Question_______________

____

I wanted my answer to be:

____

Error Log Book

*Please note any errors you made on the Palm Pilot© by pressing the wrong button.

Day (circle): M T W R F S
Time: _______am or pm?
Item Question_______________

____

I wanted my answer to be:

____

____

Day (circle): M T W R F
Time: _______am or pm?
Item Question_______________

____

I wanted my answer to be:

____

Appendix I – Positive and Negative Affect Schedule (PANAS)

<table>
<tr>
<td>PANAS</td>
<td>
Directions: For the next 20 emotion words, please indicate the extent to which you feel this way right now, at the present moment.

The response scale:
“1” Not at all or very slightly
“2” A little
“3” Moderately
“4” Quite a bit
“5” Extremely

The 20 emotion words are:
<table>
<tr><td>Interested</td><td>Hostile</td><td>Nervous</td></tr>
<tr><td>Distressed</td><td>Enthusiastic</td><td>Determined</td></tr>
<tr><td>Excited</td><td>Proud</td><td>Attentive</td></tr>
<tr><td>Upset</td><td>Irritable</td><td>Jittery</td></tr>
<tr><td>Strong</td><td>Alert</td><td>Active</td></tr>
<tr><td>Guilty</td><td>Ashamed</td><td>Afraid</td></tr>
<tr><td>Scared</td><td>Inspired</td><td>Depressed (added)</td></tr>
</table>
</td>
</tr>
</table>

Appendix J – Physical Activity Scale

PAS	Directions: How much time in the last 4 hours have you spent doing the following activities? The response scale: ”15” 15 minutes “30” 30 minutes “45” 45 minutes “1” 1 hour “2” 2 hours “3” 3 hours The 9 activity questions include: Sleep, rest Sitting quietly, watching television, listening to music or reading Working at the computer or desk, sitting in a meeting, eating Standing, washing dishes, cooking, driving Light cleaning, sweeping floors, food shopping with cart, slow dancing, walking downstairs Bicycling, brisk walking, painting or plastering Gardening, carrying, loading or stacking wood, carrying light objects upstairs Aerobics, health club exercises, chopping wood, shoveling snow More effort than previous activities, running, racing on bicycle, playing soccer or tennis

Appendix K - Daily Stress and Social Interaction on the Palm Pilot©

Stress	Question: To what extent do you currently feel stressed? • Response scale is the same as the PANAS
Social	Question1: How many people, besides yourself, are currently around you? *Response (0, 1, 2, 3, 4, 5, 6+) Question2: How much time in the last 3 hours have you spent interacting with friends and family? *Response scale is the same as the PAS

Appendix L – End of Day Health Items

Sleep/Wake	What time did you get up this morning? ________am What time do you plan on going to bed this evening?________pm About how many hours of sleep did you get LAST night? _____ hrs. How well did you sleep last night? Please CIRCLE one BELOW: Poor Fair Good Very Good Excellent
Health Behaviors	Directions: Please circle whether or not you participated in the following behaviors today: Did you eat five or more servings of fruits and vegetables today? YES NO Did you eat any red meat products today? YES NO Did you eat any diary products today? YES NO Overall, do you feel that you ate healthy today? YES NO Did you drink any caffeine today? YES NO If yes, how many drinks did you have_____________ ? If yes, what kinds of caffeine (coffee, tea, soda)? _______________________________________ Did you smoke any cigarettes today? YES NO If yes, how many_______________? Did you drink any alcohol today? YES NO If yes, how many drinks did you have_______________? If yes, what kind of drink did you have (e.g., beer, wine)? ____

Appendix M– Recall of the Day

Recall of the Day

<u>Directions:</u> In the space below, please tell us what you did today. Please include all the things you remember doing today. Please try to keep the events in the order that they occurred.

Morning

Wakeup to
9am____

____

9am to Noon____

____

Afternoon-Early Evening

Noon to
3pm____

____

3pm to 6pm____

____

Evening

6pm to
9pm____

____

9pm to Bedtime____

____

If there is anything else you would like to tell us about your day, please write about it below:

____

____

Appendix N – Midweek Contact Sheet

The following questions will be asked when the participant is called during the middle of the study. Basically, the study wants to be sure participant questions are being answered and to fix any problems that might be occurring.

RID#:____________
Date:____/____/______

Hello Mrs/Ms./Miss____________________, I am calling today to see how you are doing with the Palm Pilot© study. I wanted to see if you had any questions and if there is anything I can do to make the study run smoothly.

Are you experiencing any problems with using the pedometer or Palm Pilot©? Do you have any other concerns or questions for me? If yes, describe below:____
____
____
____
____

If the participant is experiencing any problems with using the devices in the study, the PI will take immediate action to alleviate any problems that might be occurring.

Thank you for taking time to talk this evening. Once again, we want to be sure that we answer any questions you might have while doing this study. We hope that you are able to complete all the information that the study requires in the next couple of days. If you have any problems, please do not hesitate to call me. My number is listed in your Palm Pilot©. Take care and I will see you ___PICK UP DATE/TIME__________________________

Appendix O – Participant Thoughts

Participant Thoughts about Study	Please indicate the extent to which you agree with the following statements regarding the study you just participated in.

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. Overall, I enjoyed being part of this study.	1	2	3	4	5
2. I felt comfortable using the Palm Pilot© on a daily basis.	1	2	3	4	5
3. It did not bother me too much to be paged several times a day.	1	2	3	4	5
4. I would do another study similar to this one.	1	2	3	4	5
5. The researchers did a good job answering my questions.	1	2	3	4	5
6. I felt like I made an important contribution to research.	1	2	3	4	5
7. Sometimes I would respond negatively, because I was frustrated with the Palm Pilot©.	1	2	3	4	5

8. Was this a typical week for you? YES NO (circle)
If No, what happened this week that was out of the ordinary?

____

____

9. If you have any suggestions to improve this study, please describe below

____

____

Appendix P – Medicine Label Check

Fill out this information for each prescription medicine bottle.

Is the participant currently taking medications?   YES   NO

1. Name of medicine:	**2. Name of medicine:**
Purpose of medicine: (Request if not listed)	Purpose of medicine: (Request if not listed)
Dosage/Instructions:	Dosage/Instructions:
Date of last refill: (Request if not listed)	Date of last refill: (Request if not listed)
Name of physician:	Name of physician:
Is name on label same as patients name? YES NO If no, explain:	Is name on label same as patients name? YES NO If no, explain:
Other label information:	Other label information:
How long have you been taking this medication? (mo/yr)	How long have you been taking this medication? (mo/yr)
3. Name of medicine:	**4. Name of medicine:**
Purpose of medicine: (Request if not listed)	Purpose of medicine: (Request if not listed)
Dosage/Instructions:	Dosage/Instructions:
Date of last refill: (Request if not listed)	Date of last refill: (Request if not listed)
Name of physician:	Name of physician:
Is name on label same as patients name? YES NO If no, explain:	Is name on label same as patients name? YES NO If no, explain:
Other label information:	Other label information:
How long have you been taking this medication? (mo/yr)	How long have you been taking this medication? (mo/yr)

5. Name of medicine:	**6. Name of medicine:**
Purpose of medicine: (Request if not listed)	Purpose of medicine: (Request if not listed)
Dosage/Instructions:	Dosage/Instructions:
Date of last refill: (Request if not listed)	Date of last refill: (Request if not listed)
Name of physician:	Name of physician:
Is name on label same as patients name? YES NO If no, explain:	Is name on label same as patients name? YES NO If no, explain:
Other label information:	Other label information:
How long have you been taking this medication? (mo/yr)	How long have you been taking this medication? (mo/yr)
7. Name of medicine:	**8. Name of medicine:**
Purpose of medicine: (Request if not listed)	Purpose of medicine: (Request if not listed)
Dosage/Instructions:	Dosage/Instructions:
Date of last refill: (Request if not listed)	Date of last refill: (Request if not listed)
Name of physician:	Name of physician:
Is name on label same as patients name? YES NO If no, explain:	Is name on label same as patients name? YES NO If no, explain:
Other label information:	Other label information:
How long have you been taking this medication? (mo/yr)	How long have you been taking this medication? (mo/yr)

Appendix Q

Individual Descriptive Information

Descriptive Statistics for Participant #1

Variable	Response or N	Mean	Standard Deviation	Range
Age	73			
Height	5ft 6in 167.64 cm			
Weight	155 lbs 70.46 kg			
Resting Metabolic Rate (RMR)	1273.25 kcal/day 212.21 kcal/4hr			
Positive Affect	24	25.92	7.72	10 - 38
Negative Affect	24	17.25	10.36	10 – 45
Physical Activity (kcal/4hr)	24	307.69	86.03	212.21 – 551.76

Participant 1 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	.616**	.363
Negative Affect (N_{obs} = 24)		-----	-.065
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 2 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	73			
Height	5ft 7in 170.18 cm			
Weight	178 lbs 80.91 kg			
Resting Metabolic Rate (RMR)	1360.44 kcal/day 226.74 kcal/4hr			
Positive Affect	21	22.48	4.77	14 - 32
Negative Affect	21	10.81	1.63	10 – 15
Physical Activity (kcal/4hr)	22	367.15	122.63	226.74 – 690.34

Participant 2 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 21)	-----	-.033	.733**
Negative Affect (N_{obs} = 21)		-----	.026
Physical Activity (kcal/4hr) (N_{obs} = 22)			-----

** $p \leq .01$, * $p \leq .05$

Participant 3 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	60			
Height	5ft 1 in 154.94 cm			
Weight	227.50 lbs 103.41 kg			
Resting Metabolic Rate (RMR)	1618.78 kcal/day 154.94 kcal/4hr			
Positive Affect	21	27.05	7.37	14 - 40
Negative Affect	21	12.71	3.69	10 - 22
Physical Activity (kcal/4hr)	21	438.04	221.90	269.80 – 1222.36

Participant 3 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 21)	-----	.311	.652**
Negative Affect (N_{obs} = 21)		-----	.126
Physical Activity (kcal/4hr)			
(N_{obs} = 21)			-----

** $p \leq .01$, * $p \leq .05$

Participant 4 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	66			
Height	5ft 9.25 in 175.90 cm			
Weight	261.50 lbs 118.86 kg			
Resting Metabolic Rate (RMR)	1773.03 kcal/day 295.50 kcal/4hr			
Positive Affect	24	28.46	11.43	10 – 47
Negative Affect	24	11.79	3.68	10 – 24
Physical Activity (kcal/4hr)	24	664.91	341.24	295.50 – 1459.44

Participant 4 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.067	.640**
Negative Affect (N_{obs} = 24)		-----	.168
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 5 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	86			
Height	5ft 4 in 162.56 cm			
Weight	143 lbs 65 kg			
Resting Metabolic Rate (RMR)	1154.05 kcal/day 192.34 kcal/4hr			
Positive Affect	22	19.09	4.60	12 – 29
Negative Affect	22	12.32	2.55	10 – 19
Physical Activity (kcal/4hr)	22	334.92	141.59	192.34 – 655.74

Participant 5 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 22)	-----	-.112	.409
Negative Affect (N_{obs} = 22)		-----	.247
Physical Activity (kcal/4hr) (N_{obs} = 22)			-----

** $p \leq .01$, * $p \leq .05$

Participant 6 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	79			
Height	5ft 3 in 160.02 cm			
Weight	151 lbs 68.64 kg			
Resting Metabolic Rate (RMR)	1207.78 kcal/day 201.30 kcal/4hr			
Positive Affect	23	27.09	8.07	12 – 45
Negative Affect	23	12.22	2.89	10 –24
Physical Activity (kcal/4hr)	22	462.56	226.42	201.30 – 955.27

Participant 6 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 23)	-----	.196	.081
Negative Affect (N_{obs} = 23)		-----	-.038
Physical Activity (kcal/4hr) (N_{obs} = 22)			-----

** $p \leq .01$, * $p \leq .05$

Participant 7 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	83			
Height	5ft 2 in 157.48 cm			
Weight	167 lbs 75.91 kg			
Resting Metabolic Rate (RMR)	1253.75 kcal/day 208.96 kcal/4hr			
Positive Affect	23	33.61	4.84	21 – 42
Negative Affect	23	12.09	2.98	10 – 23
Physical Activity (kcal/4hr)	23	396.78	137.15	208.96 – 688.54

Participant 7 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 23)	-----	-.064	.167
Negative Affect (N_{obs} = 23)		-----	-.019
Physical Activity(kcal/4hr) (N_{obs} = 23)			-----

** $p \leq .01$, * $p \leq .05$

Participant 8 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	89			
Height	5ft 3.25 in 160.66 cm			
Weight	190 lbs 86.36 kg			
Resting Metabolic Rate (RMR)	1330.27 kcal/day 221.71 kcal/4hr			
Positive Affect	24	29.13	4.93	19 – 37
Negative Affect	24	12.63	2.98	10 – 21
Physical Activity (kcal/4hr)	24	372.88	162.20	221.71 – 789.66

Participant 8 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect ($N_{obs} = 24$)	-----	.060	.136
Negative Affect ($N_{obs} = 24$)		-----	-.035
Physical Activity (kcal/4hr) ($N_{obs} = 24$)			-----

** $p \leq .01$, * $p \leq .05$

Participant 9 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	90			
Height	5ft 3 in 160.02 cm			
Weight	127.50 lbs 57.95 kg			
Resting Metabolic Rate (RMR)	1054.60 kcal/day 175.77 kcal/4hr			
Positive Affect	23	19.61	5.09	11 – 32
Negative Affect	23	15.17	3.73	10 – 24
Physical Activity (kcal/4hr)	23	230.26	55.86	175.77 – 392.12

Participant 9 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 23)	-----	-.454*	-.074
Negative Affect (N_{obs} = 23)		-----	.515*
Physical Activity(kcal/4hr) (N_{obs} = 23)			-----

** $p \leq .01$, * $p \leq .05$

Participant 10 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	84			
Height	4ft 11 in 66.36 cm			
Weight	146 lbs 66.36 kg			
Resting Metabolic Rate (RMR)	1145.42 kcal/day 190.90 kcal/4hr			
Positive Affect	18	33.94	2.36	31 – 38
Negative Affect	18	12.56	2.73	10 –18
Physical Activity (kcal/4hr)	18	499.37	544.64	190.90 – 2578.09

Participant 10 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	.407	.404
Negative Affect (N_{obs} = 24)		-----	.074
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 11 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	69			
Height	5ft 6.50 in 168.91 cm			
Weight	210.50 lbs 95.68 kg			
Resting Metabolic Rate (RMR)	1526.82 kcal/day 254.47 kcal/4hr			
Positive Affect	24	15.21	2.70	10 – 22
Negative Affect	24	10.46	1.18	10 – 15
Physical Activity (kcal/4hr)	24	368.23	123.13	254.47 – 730.02

Participant 11 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.345	-.029
Negative Affect (N_{obs} = 24)		-----	-.321
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 12 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	6-			
Height	5ft 1 in 154.94 cm			
Weight	176 lbs 80.00 kg			
Resting Metabolic Rate (RMR)	1396.40 kcal/day 232.73 kcal/4hr			
Positive Affect	22	26.14	7.09	11 – 43
Negative Affect	22	10.64	1.18	10 – 14
Physical Activity (kcal/4hr)	22	358.84	153.05	232.73 – 865.05

Participant 12 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect ($N_{obs} = 22$)	-----	.212	.133
Negative Affect ($N_{obs} = 22$)		-----	-.118
Physical Activity (kcal/4hr) ($N_{obs} = 22$)			-----

** $p \leq .01$, * $p \leq .05$

Participant 13 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	63			
Height	5ft 2 in 157.48cm			
Weight	125 lbs 56.82 kg			
Resting Metabolic Rate (RMR)	1166.39 kcal/day 194.40 kcal/4hr			
Positive Affect	24	33.71	4.94	25 - 42
Negative Affect	24	10.21	.83	10 - 14
Physical Activity (kcal/4hr)	24	397.65	140.88	194.40 – 715.09

Participant 13 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	.343	.017
Negative Affect (N_{obs} = 24)		-----	-.149
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 14 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	77			
Height	4ft 9.5 in 146.05 cm			
Weight	136 lbs 61.82 kg			
Resting Metabolic Rate (RMR)	1128.66 kcal/day 188.11 kcal/4hr			
Positive Affect	22	43.68	7.37	16 – 49
Negative Affect	22	11.45	2.82	10 – 19
Physical Activity (kcal/4hr)	22	233.77	54.43	376.38 – 233.77

Participant 14 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 22)	-----	-.217	-.489*
Negative Affect (N_{obs} = 22)		-----	.219
Physical Activity (kcal/4hr) (N_{obs} = 22)			-----

** $p \leq .01$, * $p \leq .05$

Participant 15 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	76			
Height	5ft 4.5 in 163.83 cm			
Weight	232 lbs 105.45 kg			
Resting Metabolic Rate (RMR)	1578.13 kcal/day 263.02 kcal/4hr			
Positive Affect	21	25.33	5.54	12 – 33
Negative Affect	21	12.76	3.11	10 – 22
Energy Expenditure (kcal/4hr)	21	740.44	331.51	263.02 – 1854.60

Participant 15 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect ($N_{obs} = 21$)	-----	-.479*	.502*
Negative Affect ($N_{obs} = 21$)		-----	-.386
Physical Activity (kcal/4hr) ($N_{obs} = 21$)			-----

** $p \leq .01$, * $p \leq .05$

Participant 16 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	56			
Height	5ft 7 in 172.09 cm			
Weight	225 lbs 102.27 kg			
Resting Metabolic Rate (RMR)	1655.94 kcal/day 275.99 kcal/4hr			
Positive Affect	24	28.04	4.51	22 – 37
Negative Affect	24	14.25	5.16	10 – 26
Physical Activity (kcal/4hr)	24	683.64	273.05	444.78 – 1601.16

Participant 16 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.259	.036
Negative Affect (N_{obs} = 24)		-----	-.245
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 17 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	71			
Height	5ft 6.5 in 168.91cm			
Weight	181 lbs 82.27 kg			
Resting Metabolic Rate (RMR)	1390.04 kcal/day 231.67 kcal/4hr			
Positive Affect	24	40.17	1.71	36 – 46
Negative Affect	24	10.25	1.22	10 – 16
Physical Activity (kcal/4hr)	24	300.71	83.77	231.67 – 533.03

Participant 17 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 21)	-----	.104	-.027
Negative Affect (N_{obs} = 21)		-----	.189
Energy Expenditure (kcal/4hr) (N_{obs} = 21)			-----

** $p \leq .01$, * $p \leq .05$

Participant 18 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	77			
Height	5ft 1 in 154.94 cm			
Weight	169 lbs 76.82 kg			
Resting Metabolic Rate (RMR)	1286.27 kcal/day 214.38 kcal/4hr			
Positive Affect	20	20.10	4.94	10 – 28
Negative Affect	20	12.35	2.76	10 – 18
Physical Activity (kcal/4hr)	20	345.81	129.70	214.38 – 712.38

Participant 18 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 21)	-----	.225	-.081
Negative Affect (N_{obs} = 21)		-----	.082
Physical Activity (kcal/4hr) (N_{obs} = 21)			-----

** $p \leq .01$, * $p \leq .05$

Participant 19 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	69			
Height	5ft 3.5 in 161.29 cm			
Weight	182 lbs 82.73 kg			
Resting Metabolic Rate (RMR)	1390.80 kcal/day 231.80 kcal/4hr			
Positive Affect	24	24.42	3.34	18 – 29
Negative Affect	24	10.25	.61	10 – 12
Physical Activity (kcal/4hr)	24	398.40	211.04	231.80 – 912.10

Participant 19 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect ($N_{obs} = 24$)	-----	.054	.291
Negative Affect ($N_{obs} = 24$)		-----	-.100
Physical Activity (kcal/4hr) ($N_{obs} = 24$)			-----

** $p \leq .01$, * $p \leq .05$

Participant 20 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	70			
Height	5ft 1.5 in 156.21 cm			
Weight	145.50 lbs 66.14 kg			
Resting Metabolic Rate (RMR)	1219.85 kcal/day 203.31 kcal/4hr			
Positive Affect	24	29.67	3.00	24 – 37
Negative Affect	24	10.50	.98	10 – 14
Physical Activity (kcal/4hr)	24	316.33	108.10	203.31 – 635.21

Participant 20 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	.341	-.185
Negative Affect (N_{obs} = 24)		-----	-.122
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 21 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	69			
Height	5ft 6 in 167.64 cm			
Weight	168 lbs 76.36 kg			
Resting Metabolic Rate (RMR)	1341.14 kcal/day 223.52 kcal/4hr			
Positive Affect	24	26.04	4.89	19 – 37
Negative Affect	24	10.75	1.36	10 – 15
Physical Activity (kcal/4hr)	24	486.32	274.435	275.76 – 1463.25

Participant 21 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	.211	.446*
Negative Affect (N_{obs} = 24)		-----	.229
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 22 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	68			
Height	5ft 6.75 in 169.55 cm			
Weight	309 lbs 140.45 kg			
Resting Metabolic Rate (RMR)	1957.94 kcal/day 326.32 kcal/4hr			
Positive Affect	23	20.96	6.71	13 – 42
Negative Affect	23	10.57	.90	10 – 13
Physical Activity (kcal/4hr)	23	600.55	272.50	326.32 – 1482.57

Participant 22 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.026	.094
Negative Affect (N_{obs} = 24)		-----	.001
Physical Activity(kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 23 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	66			
Height	5ft 3.5 in 161.29 cm			
Weight	172 lbs 78.18 kg			
Resting Metabolic Rate (RMR)	1883.22 kcal/day 226.95 kcal/4hr			
Positive Affect	21	21.76	3.69	16 – 30
Negative Affect	21	11.71	1.85	10 - 17
Physical Activity (kcal/4hr)	22	556.88	341.71	226.95 – 1664.11

Participant 23 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.407	.065
Negative Affect (N_{obs} = 24)		-----	-.086
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 24 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	79			
Height	5ft 2 in 157.48 cm			
Weight	146 lbs 66.36 kg			
Resting Metabolic Rate (RMR)	1181.87 kcal/day 196.98 kcal/4hr			
Positive Affect	24	24.42	3.31	16 – 31
Negative Affect	24	10.38	.71	10 – 12
Physical Activity (kcal/4hr)	24	428.33	121.58	240.48 – 756.71

Participant 24 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.217	.373
Negative Affect (N_{obs} = 24)		-----	-.268
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 25 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	57			
Height	5ft 2.5 in 158.75 cm			
Weight	182 lbs 82.73 kg			
Resting Metabolic Rate (RMR)	1442.88 kcal/day 240.41 kcal/4hr			
Positive Affect	23	23.35	4.06	15 – 29
Negative Affect	23	10.87	2.14	10 – 19
Physical Activity (kcal/4hr)	24	522.68	153.06	262.44 – 870.48

Participant 25 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	.126	.546**
Negative Affect (N_{obs} = 24)		-----	-.051
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 26 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	77			
Height	5ft 5 in 165.10 cm			
Weight	181 lbs 82.27 kg			
Resting Metabolic Rate (RMR)	1355.36 kcal/day 225.89 kcal/4hr			
Positive Affect	22	28.68	6.85	10 – 40
Negative Affect	22	10.55	.96	10 – 13
Physical Activity (kcal/4hr)	22	536.24	390.66	237.26 – 1683.05

Participant 26 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 22)	-----	-.045	.163
Negative Affect (N_{obs} = 22)		-----	-.293
Physical Activity (kcal/4hr) (N_{obs} = 22)			-----

** $p \leq .01$, * $p \leq .05$

Participant 27 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	68			
Height	5ft 4 in 158.75 cm			
Weight	188 lbs 85.45 kg			
Resting Metabolic Rate (RMR)	1423.57 kcal/day 237.26 kcal/4hr			
Positive Affect	22	43.91	2.04	39 – 47
Negative Affect	22	10.09	.29	10 – 11
Physical Activity (kcal/4hr)	24	362.15	195.56	200.31 – 1127.60

Participant 27 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.065	.151
Negative Affect (N_{obs} = 24)		-----	-.090
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 28 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	69			
Height	5ft 2.75in 157.48cm			
Weight	139lbs 66.36kg			
Resting Metabolic Rate (RMR)	1181.88 kcal/day 196.98 kcal/4hr			
Positive Affect	24	35.83	6.29	24 - 44
Negative Affect	24	10.33	0.96	10 - 14
Physical Activity (kcal/4hr)	23	438.53	254.30	210.80 – 946.68

Participant 28 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	.081	.431*
Negative Affect (N_{obs} = 24)		-----	-.083
Physical Activity (kcal/4hr) (N_{obs} = 23)			-----

** $p \leq .01$, * $p \leq .05$

Participant 29 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	61			
Height	5ft 9in 175.26cm			
Weight	203lbs 92.27kg			
Resting Metabolic Rate (RMR)	1542.82 kcal/day 257.14 kcal/4hr			
Positive Affect	24	30.88	2.61	26 - 38
Negative Affect	24	10.17	0.64	10 - 13
Physical Activity (kcal/4hr)	24	558311	204.40	257.14 – 968.83

Participant 30 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} =)	-----	.039	.340
Negative Affect (N_{obs} =)		-----	- .072
Physical Activity (kcal/4hr) (N_{obs} =)			-----

** $p \leq .01$, * $p \leq .05$

Participant 30 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	66			
Height	5ft 9 in 175.26 cm			
Weight	171.50 lbs 77.95 kg			
Resting Metabolic Rate (RMR)	1383.31 kcal/day 230.55 kcal/4hr			
Positive Affect	23	21.87	5.45	10 – 32
Negative Affect	23	14.09	2.97	10 - 21
Physical Activity (kcal/4hr)	23	412.87	120.65	257.06 – 660.83

Participant 30 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	.290	.337
Negative Affect (N_{obs} = 24)		-----	-.010
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 31 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	56			
Height	5ft 2in 157.48cm			
Weight	294lbs 133.64kg			
Resting Metabolic Rate (RMR)	1942.44 kcal/day 323.74 kcal/4hr			
Positive Affect	24	14.75	4.43	10 - 24
Negative Affect	24	10.42	0.72	10 - 13
Physical Activity (kcal/4hr)	24	517.49	189.22	323.74 – 1052.42

Participant 31 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.187	-.021
Negative Affect (N_{obs} = 24)		-----	.297
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 32 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	74			
Height	5ft 2in 157.48cm			
Weight	145 lbs 65.91 kg			
Resting Metabolic Rate (RMR)	1207.62 kcal/day 201.27 kcal/4hr			
Positive Affect	24	18.13	2.71	13 - 23
Negative Affect	24	11.42	1.98	10 - 15
Physical Activity (kcal/4hr)	24	440.61	176.98	228.02 – 1003.48

Participant 32 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.449*	-.524**
Negative Affect (N_{obs} = 24)		-----	.660**
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 33 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	65			
Height	5ft 10.5in 70.50cm			
Weight	189 lbs 85.91 kg			
Resting Metabolic Rate (RMR)	1478.64 kcal/day 246.44 kcal/4hr			
Positive Affect	24	14.5	4.22	10 - 16
Negative Affect	24	11.21	1.74	10 - 16
Physical Activity (kcal/4hr)	24	593.50	182.52	246.44 – 1138.84

Participant 33 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	-.027	.349
Negative Affect (N_{obs} = 24)		-----	.293
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 34 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	65			
Height	5ft 6.5in 168.91cm			
Weight	151 lbs			
68.64 kg				
Resting Metabolic Rate (RMR)	1295.58 kcal/day 215.93 kcal/4hr			
Positive Affect	24	22.50	5.21	14 - 31
Negative Affect	24	10.13	0.45	10 - 12
Physical Activity (kcal/4hr)	24	413.68	164.59	215.93 – 842.25

Participant 34 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} =)	-----	-.270	-.175
Negative Affect (N_{obs} =)		-----	.349
Physical Activity (kcal/4hr) (N_{obs} =)			-----

** $p \leq .01$, * $p \leq .05$

Participant 35 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	69			
Height	5ft 2in 157.48cm			
Weight	125 lbs 56.82 kg			
Resting Metabolic Rate (RMR)	1143.90 kcal/day 190.65 kcal/4hr			
Positive Affect	24	34.83	4.34	28 - 43
Negative Affect	24	10.00	0.00	10 - 10
Physical Activity (kcal/4hr)	24	384.79	248.86	190.65 – 1267.80

Participant 35 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} = 24)	-----	.	.515*
Negative Affect (N_{obs} = 24)		-----	.
Physical Activity (kcal/4hr) (N_{obs} = 24)			-----

** $p \leq .01$, * $p \leq .05$

Participant 36 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	72			
Height	5ft 4in 162.56cm			
Weight	139 lbs 63.18 kg			
Resting Metabolic Rate (RMR)	1199.52 kcal/day 199.92 kcal/4hr			
Positive Affect	24	30.67	4.01	21 - 36
Negative Affect	24	11.50	1.64	10 - 15
Physical Activity (kcal/4hr)	24	512.90	319.50	212.30 – 1152.64

Participant 36 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect ($N_{obs} = 24$)	-----	.145	-.165
Negative Affect ($N_{obs} = 24$)		-----	.165
Physical Activity (kcal/4hr) ($N_{obs} = 24$)			-----

** $p \leq .01$, * $p \leq .05$

Participant 37 Descriptive Statistics

Variable	Response or N	Mean	Standard Deviation	Range
Age	58			
Height	5ft 3in 161.93cm			
Weight	208 lbs 94.55 kg			
Resting Metabolic Rate (RMR)	1565.28 kcal/day 260.88 kcal/4hr			
Positive Affect	23	21.70	4.42	12 - 28
Negative Affect	23	13.61	3.88	10 - 23
Physical Activity (kcal/4hr)	23	474.71	270.85	260.88 – 1281.37

Participant 37 Bivariate Correlations among Study Variables

Variable	1	2	3
Positive Affect (N_{obs} =)	-----	-.021	.015
Negative Affect (N_{obs} =)		-----	.011
Physical Activity (kcal/4hr) (N_{obs} =)			-----

** $p \leq .01$, * $p \leq .05$

Appendix R

Individual Affect and Physical Activity Descriptives by Study Day

Daily Descriptive Statistics for Participant #1

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	32.5	6.56	130	23 – 38
	Tuesday	31.25	4.35	125	27 – 35
	Wednesday	22.50	9.03	89	10 – 30
	Thursday	26.72	3.77	107	22 – 31
	Friday	22.00	8.12	88	10 – 27
	Saturday	20.75	7.93	83	11 - 29
Negative Affect	Monday	32.75	8.81	131	25 – 45
	Tuesday	24.75	11.76	99	11 – 38
	Wednesday	12.25	4.50	49	10 – 19
	Thursday	11.20	1.91	46	10 – 14
	Friday	12.00	2.83	48	10 – 16
	Saturday	10.25	.50	41	10 - 11
Physical Activity	Monday	253.01	29.22	1012.06	211.03 – 278.48
	Tuesday	338.31	62.85	1353.24	287.72 – 422.62
	Wednesday	263.93	35.53	1055.71	211.03 – 287.72
	Thursday	290.72	55.03	1162.87	211.03 – 327.43
	Friday	257.98	46.35	1031.91	211.03 – 302.27
	Saturday	263.31	50.82	1053.25	211.03 – 318.21

Daily Descriptive Statistics for Participant #2

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	23.73	4.11	94.91	19 – 29
	Tuesday	20.40	2.63	81.58	18 – 24
	Wednesday	19.75	1.50	79	18 – 21
	Thursday	19.75	1.50	79	18 – 21
	Friday	23.37	7.43	93.48	14 – 32
	Saturday	27.75	2.06	111	26 - 30
Negative Affect	Monday	10.79	1.48	43.14	10 – 13
	Tuesday	10.58	.68	42.30	10 – 11.30
	Wednesday	11.25	2.5	45	10 – 15
	Thursday	10.00	.00	40	10 – 10
	Friday	12.20	2.10	48.81	10 – 14
	Saturday	10.00	.00	40	10 - 10
Physical Activity	Monday	321.19	61.28	1284.77	244.43 – 392.27
	Tuesday	352.62	85.42	1410.48	280.91 – 463.81
	Wednesday	286.89	46.40	1147.55	226.74 – 339.97
	Thursday	318.74	79.81	1274.94	226.74 – 421.37
	Friday	431.09	210.56	1724.37	226.74 – 690.43
	Saturday	477.08	87.52	1908.31	403.65 – 577.07

Daily Descriptive Statistics for Participant #3

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	32.75	3.10	131	30-37
	Tuesday	29.21	5.80	116.84	23-37
	Wednesday	29.30	1.53	93.18	21-24.18
	Thursday	25	13.11	100	14-40
	Friday	25.75	7.93	103	16-34
	Saturday	26.46	3.06	105.84	22-28.84
Negative Affect	Monday	13.75	5.68	55	10-22
	Tuesday	15.16	5.46	60.62	10-22
	Wednesday	12.15	1.98	48.62	10.62-15
	Thursday	12.50	2.38	50	10-15
	Friday	10.50	1.00	42	10-12
	Saturday	11.16	.87	44.62	10-12
Physical Activity	Monday	474.11	139.50	1896.44	341.37-668.35
	Tuesday	442.38	161.74	1769.50	269.80-602.27
	Wednesday	362.22	58.16	1448.89	317.51-443.37
	Thursday	655.59	514.75	2322.37	269.80-1357.26
	Friday	340.44	49.52	1361.76	269.80-382.08
	Saturday	440.52	160.03	1762.10	269.80-602.27

Daily Descriptive Statistics for Participant #4

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	27.75	12.66	111	10-40
	Tuesday	29	13.32	116	10-11
	Wednesday	25.50	11.03	102	10-36
	Thursday	25.50	5.07	102	18-29
	Friday	34.50	17.02	138	10-47
	Saturday	28.50	12.40	114	10-36
Negative Affect	Monday	10.50	.58	42	10-11
	Tuesday	10.25	.50	41	10-11
	Wednesday	12.25	3.2	49	10-17
	Thursday	16.50	7.05	66	10-24
	Friday	11	2.00	44	10-14
	Saturday	10.25	.50	41	10-11
Physical Activity	Monday	628.98	495.26	2515.93	295.50-1365.84
	Tuesday	621.81	224.67	2487.25	295.50-809.96
	Wednesday	744.15	499.86	2976.60	295.50-1459.44
	Thursday	598.41	176.69	2393.65	440.03-848.16
	Friday	730.70	398.17	2922.80	295.50-1146.17
	Saturday	665.43	364.86	2661.72	295.50-1141.70

Daily Descriptive Statistics for Participant #5

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	20.25	5.06	81	14-26
	Tuesday	17.25	4.11	69	12-21
	Wednesday	20.71	3.68	82.85	16-25
	Thursday	19.25	2.63	77	17-23
	Friday	20.75	6.65	83	14-29
	Saturday	17.25	4.99	69	12-24
Negative Affect	Monday	12.75	2.21	51	10-15
	Tuesday	13	2.94	52	10-17
	Wednesday	13.47	3.88	53.89	10-19
	Thursday	13.5	1.73	54	11-15
	Friday	10.25	.50	41	10-11
	Saturday	10.50	1.00	42	10-12
Physical Activity	Monday	377.99	212.93	1511.97	192.34-655.74
	Tuesday	389.4316	161.84	1557.73	192.34-575.86
	Wednesday	352.91	51.18	1411.64	280.76-400.69
	Thursday	386.62	126.91	1546.48	219.49-526.22
	Friday	283.76	142.11	1135.04	192.34-491.71
	Saturday	221.71	35.94	886.86	192.34-265.63

Daily Descriptive Statistics for Participant #6

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	32.75	1.71	131	31-35
	Tuesday	28.29	6.32	113.17	21-36
	Wednesday	32.25	14.24	129	12-45
	Thursday	24.25	5.50	97	19-29
	Friday	22.75	1.50	91	21-24
	Saturday	23.59	7.94	94.35	13-30
Negative Affect	Monday	15.25	5.85	61	12-24
	Tuesday	12	1.41	48	10-13
	Wednesday	11.75	2.06	47	10-14
	Thursday	11.50	1.73	46	10-14
	Friday	11.50	.58	46	11-12
	Saturday	11.80	1.72	47.20	10-14
Physical Activity	Monday	433.48	194.76	1733.91	201.30-623.17
	Tuesday	404.90	170.14	1619.62	201.30-617.74
	Wednesday	350.61	136.76	1402.44	201.30-531.37
	Thursday	630	262.60	2520.03	325.72-944.08
	Friday	563.84	345.64	2255.35	374.65-1081.08
	Saturday	428.16	245.72	1712.65	201.30-716.83

Daily Descriptive Statistics for Participant #7

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	35.75	3.77	143	32-41
	Tuesday	34	5.83	136	28-42
	Wednesday	33.50	1.29	134	32-35
	Thursday	35.32	1.84	141.27	34-38
	Friday	37	2.83	148	33-39
	Saturday	26.25	3.59	105	21-29
Negative Affect	Monday	11.50	1.29	46	10-13
	Tuesday	12.50	2.38	50	10-15
	Wednesday	14.5	5.92	58	10-23
	Thursday	12.67	1.05	50.68	11.68-14
	Friday	10	0.000	40	10-10
	Saturday	11.25	2.50	45	10-15
Physical Activity	Monday	365.51	83.17	1462.04	276.28-475.54
	Tuesday	348.68	81.12	1394.72	235.75-408.90
	Wednesday	489.91	159.69	1875.64	276.28-634.95
	Thursday	391.62	115.09	1566.47	296.20-555.25
	Friday	494.26	211.99	1977.03	208.96-688.54
	Saturday	308.83	80.38	1235.31	208.96-396.51

Daily Descriptive Statistics for Participant #8

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	27.25	7.93	109	19-35
	Tuesday	29	6.27	116	24-37
	Wednesday	27	4.97	108	23-34
	Thursday	34.25	.96	137	33-35
	Friday	29.75	2.22	119	27-32
	Saturday	27.50	1.91	110	26-30
Negative Affect	Monday	15.75	3.59	63	13-21
	Tuesday	11.75	.50	47	11-12
	Wednesday	13	3.37	52	11-18
	Thursday	13.25	4.03	53	10-19
	Friday	11	2.00	44	10-14
	Saturday	11	1.15	44	10-12
Physical Activity	Monday	434.53	248.42	1738.13	253.19-789.66
	Tuesday	281.32	113.48	1525.30	221.71-478.61
	Wednesday	254.76	43.60	1019.06	221.71-313.63
	Thursday	394.23	153.64	1576.92	221.71-561.72
	Friday	474.51	211.60	1898.04	221.71-725.42
	Saturday	297.89	105.70	1191.57	221.71-445.85

Daily Descriptive Statistics for Participant #9

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	24.19	6.22	96.77	16.77-32
	Tuesday	18	.000	72	18-18
	Wednesday	20	6.38	80	11-26
	Thursday	16.75	4.99	67	13-24
	Friday	20.75	5.56	83	13-26
	Saturday	17.25	2.36	69	14-19
Negative Affect	Monday	14.8	1.47	59.20	14-17
	Tuesday	14.5	2.89	58	11-18
	Wednesday	12.25	1.26	49	11-14
	Thursday	19	3.56	76	16-24
	Friday	15.25	5.38	61	10-22
	Saturday	15	4.08	60	12-21
Physical Activity	Monday	230.28	36.79	921.12	192.67-276.34
	Tuesday	246.55	102.02	986.20	175.77-392.12
	Wednesday	207.04	28.49	828.16	175.77-242.54
	Thursday	230.28	20.39	921.13	214.65-260.28
	Friday	253.94	83.22	1015.78	175.77-368.46
	Saturday	204.08	26.45	816.33	175.77-229.86

Daily Descriptive Statistics for Participant #10

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	33.79	.92	135.14	33-35
	Tuesday	34.79	2.72	139.14	32-38
	Wednesday	34.29	2.73	137.14	31-37
	Thursday	33.37	1.60	133.48	31-34.48
	Friday	34.25	2.87	137	31-38
	Saturday	32.37	1.48	129.48	31-34.48
Negative Affect	Monday	12.82	3.78	51.28	10-18
	Tuesday	12.82	.56	51.28	12-13.28
	Wednesday	12.32	2.90	49.28	10-16
	Thursday	11.96	2.16	47.85	10-15
	Friday	12.25	2.22	49	10-15
	Saturday	13.21	3.00	52.85	10-17
Physical Activity	Monday	425.63	225.77	1702.54	190.90-731.62
	Tuesday	444.43	166.44	1777.71	219.30-582.24
	Wednesday	409.17	167.68	1636.69	190.90-599.66
	Thursday	304.86	134.82	1219.44	190.90-454.77
	Friday	900.77	1123.61	3603.10	190.90-2578.09
	Saturday	358.58	116.64	1434.32	190.90-454.77

Daily Descriptive Statistics for Participant #11

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	17.25	3.59	69	14-22
	Tuesday	17.50	2.38	70	16-21
	Wednesday	15.50	1.73	62	14-18
	Thursday	11.75	1.71	47	10-14
	Friday	14.75	.50	59	14-15
	Saturday	14.50	1.29	58	13-16
Negative Affect	Monday	10	.000	40	10-10
	Tuesday	10	.000	40	10-10
	Wednesday	10	.000	40	10-10
	Thursday	11.50	2.38	46	10-15
	Friday	11	1.41	44	10-13
	Saturday	10.25	.50	41	10-11
Physical Activity	Monday	432.80	205.92	1731.20	254.47-730.02
	Tuesday	408.94	114.59	1635.78	254.47-529.08
	Wednesday	326.26	67.40	1305.06	254.47-404.34
	Thursday	388.85	180.30	1555.39	254.47-654.67
	Friday	310.56.72	64.78	1242.27	254.47-366.66
	Saturday	341.96	58.41	1367.85	254.47-373.56

Daily Descriptive Statistics for Participant #12

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	20.75	8.14	83	11-30
	Tuesday	27.63	4.96	110.52	21-33
	Wednesday	28	3.37	112	23-30
	Thursday	27	6.27	108	19-32
	Friday	23	2.71	92	21-27
	Saturday	30.09	11.32	120.36	19-43
Negative Affect	Monday	12	.82	48	11-13
	Tuesday	10.28	.56	41.11	10-11.11
	Wednesday	10.50	1.00	42	10-12
	Thursday	10	.000	40	10-10
	Friday	10	.000	40	10-10
	Saturday	11.19	1.91	44.77	10-14
Physical Activity	Monday	389.09	111.51	1528.37	232.73-491.09
	Tuesday	453.56	277.40	1814.23	266.64-865.05
	Wednesday	291.47	77.38	1165.87	232.73-395.82
	Thursday	357.07	148.25	1428.28	232.73-526.64
	Friday	334.46	87.55	1337.83	232.73-436.18
	Saturday	316.51	138.58	1266.06	232.73-521.82

Daily Descriptive Statistics for Participant #13

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	35.75	5.32	143	30-42
	Tuesday	32	4.76	128	29-39
	Wednesday	34	4.32	136	28-38
	Thursday	31.75	2.06	127	29-34
	Friday	31.50	7.33	126	25-42
	Saturday	37.25	4.65	149	31-42
Negative Affect	Monday	11.25	1.89	45	10-14
	Tuesday	10	.000	40	10-10
	Wednesday	10	.000	40	10-10
	Thursday	10	.000	40	10-10
	Friday	10	.000	40	10-10
	Saturday	10	.000	40	10-10
Physical Activity	Monday	307.25	98.69	1229	194.40-421.48
	Tuesday	316.51	88.47	1266.03	212.08-421.48
	Wednesday	454.62	141.30	1818.49	252.97-558.48
	Thursday	449.99	221.40	1799.97	250.21-715.09
	Friday	429.00	168.95	1716.01	229.76-641.36
	Saturday	428.52	82.61	1714.08	335.84-536.95

Daily Descriptive Statistics for Participant #14

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	39.75	5.44	159	32-44
	Tuesday	48	.82	192	47-49
	Wednesday	38	14.79	152	16-48
	Thursday	47	2.00	188	44-48
	Friday	43.45	5.33	173.80	37.80-48
	Saturday	44.70	2.50	178.80	42-48
Negative Affect	Monday	10.25	.50	41	10-11
	Tuesday	14.25	4.92	57	10-19
	Wednesday	11.50	3.00	46	10-16
	Thursday	10	.000	40	10-10
	Friday	11.55	1.93	46.20	10-14
	Saturday	11.40	1.89	45.60	10-14
Physical Activity	Monday	242.80	30.72	971.18	208.81-282.66
	Tuesday	274.75	70.60	1099.02	213.28-376.38
	Wednesday	238.32	92.23	953.30	188.11-376.38
	Thursday	224.75	42.87	898.99	200.69-288.79
	Friday	223.21	48.75	892.82	188.11-295.21
	Saturday	209.12	6.04	836.49	200.69-213.71

Daily Descriptive Statistics for Participant #15

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	26.25	2.87	105	24-30
	Tuesday	29	3.16	116	25-32
	Wednesday	27.25	5.06	109	23-33
	Thursday	20	9.27	80	12-33
	Friday	21.27	7.05	85.06	11-27
	Saturday	24.50	3.42	98	20-28
Negative Affect	Monday	11.25	1.26	45	10-13
	Tuesday	11.75	3.50	47	10-17
	Wednesday	10.75	.96	43	10-12
	Thursday	15.50	4.65	62	11-22
	Friday	14.66	3.21	58.63	11.63-19
	Saturday	14	2.16	56	12-17
Physical Activity	Monday	1037.39	553.54	4149.55	648.80-1854.60
	Tuesday	724.26	191.32	2897.03	524.24-923.85
	Wednesday	733.13	337.87	2932.50	393.63-1172.98
	Thursday	546.51	221.01	2186.03	263.02-796.69
	Friday	516.82	178.35	2067.28	263.02-657.44
	Saturday	714.96	205.12	2859.86	482.71-956.73

Daily Descriptive Statistics for Participant #16

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	24.75	1.26	99	23-26
	Tuesday	28.50	5.68	114	25-37
	Wednesday	26.25	3.40	105	22-29
	Thursday	29	5.72	116	24-37
	Friday	28	5.23	112	23-33
	Saturday	31.75	3.40	127	27-35
Negative Affect	Monday	21.25	6.18	85	13-26
	Tuesday	16.25	6.65	65	11-26
	Wednesday	12.75	1.89	51	10-14
	Thursday	11	.82	44	10-12
	Friday	12.5	3.00	50	10-16
	Saturday	11.75	2.87	47	10-16
Physical Activity	Monday	306.95	68.39	1227.79	231.67-374.99
	Tuesday	306.95	87.71	1227.79	231.67-432.41
	Wednesday	315.97	101.25	1263.87	231.67-461.37
	Thursday	281.86	67.73	1127.42	231.67-374.99
	Friday	346.52	134.50	1386.08	231.67-533.03
	Saturday	246.03	28.71	984.10	231.67-289.09

Daily Descriptive Statistics for Participant #17

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	40.75	0.96	163	40 – 42
	Tuesday	41.50	3.00	166	40 – 46
	Wednesday	40.00	0.00	160	40 – 40
	Thursday	40.00	0.00	160	40 – 40
	Friday	39.75	1.89	159	37 – 41
	Saturday	39.00	2.00	156	36 - 40
Negative Affect	Monday	11.50	3.00	46	10 – 16
	Tuesday	10.00	0.00	40	10 – 10
	Wednesday	10.00	0.00	40	10 – 10
	Thursday	10.00	0.00	40	10 – 10
	Friday	10.00	0.00	40	10 – 10
	Saturday	10.00	0.00	40	10 - 10
Physical Activity	Monday	306.95	68.39	1227.79	231.67 – 374.99
	Tuesday	306.95	87.71	1227.79	231.67 – 432.41
	Wednesday	315.97	101.25	1263.87	231.67 – 461.37
	Thursday	281.86	67.73	1127.42	231.67 – 374.99
	Friday	346.52	134.50	1386.08	231.67 – 533.03
	Saturday	246.03	28.71	984.10	231.67 – 289.09

Daily Descriptive Statistics for Participant #18

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	25.75	3.20	103	21-28
	Tuesday	20.75	3.40	83	18-25
	Wednesday	20	2.94	80	17-23
	Thursday	20.89	2.17	83.55	19-24
	Friday	17.03	4.78	68.10	10-20.10
	Saturday	16.91	5.32	67.62	11-22.52
Negative Affect	Monday	11.50	1.29	46	10-13
	Tuesday	12	2.16	48	10-15
	Wednesday	16.75	1.89	67	14-18
	Thursday	10.84	1.11	43.34	10-12.34
	Friday	11.59	1.95	46.35	10-14
	Saturday	11.40	1.11	45.58	10-12.35
Physical Activity	Monday	318.72	67.18	1274.90	261.48-409.53
	Tuesday	296.83	53.40	1187.33	258.16-375.84
	Wednesday	365.89	181.32	1463.55	214.38-624.99
	Thursday	377.04	72.15	1508.16	275.01-429.83
	Friday	363.30	233.91	1453.20	214.38-712.42
	Saturday	301.78	65.73	1207.12	248.08-396.14

Daily Descriptive Statistics for Participant #19

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	25.00	4.08	100	19 – 28
	Tuesday	25.50	1.29	102	24 – 27
	Wednesday	24.75	4.19	99	19 – 29
	Thursday	26.75	2.06	107	24 – 29
	Friday	20.25	1.71	81	18 – 22
	Saturday	24.25	3.10	97	20 - 27
Negative Affect	Monday	10.50	1.00	42	10 – 12
	Tuesday	10.00	.00	40	10 – 10
	Wednesday	10.25	.50	41	10 – 11
	Thursday	10.5	1.0	42	10 – 12
	Friday	10.25	.50	41	10 – 11
	Saturday	10.00	.00	40	10 - 10
Physical Activity	Monday	480.57	290.72	1922.27	278.83 – 912.10
	Tuesday	490.54	317.00	1962.16	231.80 – 901.33
	Wednesday	484.19	272.40	1936.76	231.80 – 752.88
	Thursday	273.4	41.62	1093.62	231.80 – 325.87
	Friday	300.54	46.80	1202.14	249.89 – 362.04
	Saturday	361.16	112.92	144.62	231.80 – 506.83

Daily Descriptive Statistics for Participant #20

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	32	5.60	128	24 – 37
	Tuesday	25.50	1.73	102	24 – 27
	Wednesday	29.75	0.96	119	29 – 31
	Thursday	30.25	0.96	121	29 – 31
	Friday	30.5	1.00	122	29 – 31
	Saturday	30.00	0.00	120	30 - 30
Negative Affect	Monday	11.25	1.89	45	10 – 14
	Tuesday	10.25	0.50	41	10 – 11
	Wednesday	10.00	0.00	40	10 – 10
	Thursday	10.50	1.00	42	10 – 12
	Friday	10.00	0.00	40	10 – 10
	Saturday	11.00	0.82	44	10 – 12
Physical Activity	Monday	385.17	141.29	1540.67	225.23 – 569.16
	Tuesday	323.55	60.26	1294.21	247.34 – 379.44
	Wednesday	359.50	194.12	1438.01	203.31 – 635.21
	Thursday	282.38	49.80	1129.52	225.33 – 330.75
	Friday	256.02	63.97	1024.10	203.31 – 348.12
	Saturday	291.38	75.13	1165.51	203.31 – 379.44

Daily Descriptive Statistics for Participant #21

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	25.00	3.56	100	22 – 30
	Tuesday	24.25	5.12	97	19 – 30
	Wednesday	23.75	4.50	95	20 – 30
	Thursday	31.25	0.50	125	31 – 32
	Friday	27.00	7.35	108	21 – 37
	Saturday	25.00	4.32	100	21 - 31
Negative Affect	Monday	11.25	1.50	45	10 – 13
	Tuesday	11.75	2.36	47	10 – 15
	Wednesday	10.5	1.00	42	10 –12
	Thursday	10.00	0.00	40	10 – 10
	Friday	11.00	1.41	44	10 – 13
	Saturday	10.00	0.00	40	10 - 10
Physical Activity	Monday	655.47	543.55	2621.87	295.80 – 1463.25
	Tuesday	386.31	13.12	1545.23	374.16 – 404.53
	Wednesday	1130.75	831.08	4523.00	309 – 2219
	Thursday	556.23	358.90	2224.93	275.76 – 1082.40
	Friday	549.25	311.24	2196.99	291.85 – 1002.22
	Saturday	425.33	148.42	1701.34	321.92 – 645.07

Daily Descriptive Statistics for Participant #22

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	21.00	5.83	84	13 – 27
	Tuesday	23.25	12.92	93	13 – 42
	Wednesday	22.00	5.35	88	19 – 30
	Thursday	18.75	6.13	75	13 – 25
	Friday	17.25	2.63	69	15 – 21
	Saturday	22.75	4.65	90.99	17.99 - 29
Negative Affect	Monday	11.00	1.41	44	10 – 13
	Tuesday	10.00	0.00	40	10 – 10
	Wednesday	10.75	0.96	43	10 – 12
	Thursday	11.00	1.15	44	10 – 12
	Friday	10.5	0.58	42	10 – 11
	Saturday	10.12	0.22	40.43	10 – 10.43
Physical Activity	Monday	475.66	128.31	1902.62	326.32 – 605.58
	Tuesday	441.24	37.44	1764.96	396.13 – 486.34
	Wednesday	646.66	294.82	2586.65	326.32 – 924.84
	Thursday	556.65	236.21	2226.59	326.32 – 765.60
	Friday	580.18	210.64	2320.72	326.32 – 808.35
	Saturday	852.43	456.04	3409.72	398.70 – 1482.57

Daily Descriptive Statistics for Participant #23

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	20.50	1.00	82	20 – 22
	Tuesday	20.75	2.22	83	18 – 23
	Wednesday	22.14	1.31	88.55	21 – 24
	Thursday	21.00	6.22	84	16 – 30
	Friday	21.19	1.68	84.77	19 – 23
	Saturday	24.89	4.86	99.55	20 - 30
Negative Affect	Monday	12.75	3.10	51	10 – 17
	Tuesday	12.25	2.06	49	10 – 14
	Wednesday	10.54	0.63	42.17	10 – 11.17
	Thursday	11.50	1.73	46	10 – 13
	Friday	11.92	0.83	47.67	11 – 13
	Saturday	11.04	0.82	44.17	10 - 12
Physical Activity	Monday	605.86	325.78	2423.43	313.87 – 1072.59
	Tuesday	417.54	175.77	1670.14	226.95 – 649.47
	Wednesday	836.64	667.05	3346.56	280.67 – 1805.96
	Thursday	590.24	438.95	2360.96	280.67 – 1231.34
	Friday	463.11	138.62	1852.43	297.27 – 632.87
	Saturday	511.83	190.06	2047.31	226.95 – 613.25

Daily Descriptive Statistics for Participant #24

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	23.00	4.76	92	16 – 26
	Tuesday	25.00	2.45	100	22 – 28
	Wednesday	24.25	2.75	97	21 – 27
	Thursday	24.50	3.11	98	20 – 27
	Friday	23.00	2.45	92	21 – 26
	Saturday	26.75	4.35	107	21 - 31
Negative Affect	Monday	10.75	0.96	43	10 - 12
	Tuesday	10.00	0.00	40	10 – 10
	Wednesday	10.5	1.00	42	10 – 12
	Thursday	10.25	0.50	41	10 – 11
	Friday	10.75	0.96	43	10 – 12
	Saturday	10.00	0.00	40	10 - 10
Physical Activity	Monday	403.58	131.59	1614.34	240.48 – 522.00
	Tuesday	417.37	50.60	1669.49	349.92 – 467.71
	Wednesday	420.30	91.09	1681.20	325.69 – 544.57
	Thursday	387.30	84.74	1549.19	319.00 – 493.59
	Friday	426.36	91.17	1705.43	347.41 – 557.95
	Saturday	515.10	237.31	2060.39	240.48 – 756.71

Daily Descriptive Statistics for Participant #25

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	22.00	2.71	88	18 – 24
	Tuesday	24.50	1.73	98	22 – 26
	Wednesday	22.25	5.91	89	15 – 28
	Thursday	20.75	3.77	83	18 – 26
	Friday	24.50	4.73	98	18 – 28
	Saturday	25.75	3.95	103	21 - 29
Negative Affect	Monday	13.5	4.36	54	10 – 19
	Tuesday	10.25	0.50	41	10 – 11
	Wednesday	10.00	0.00	40	10 – 10
	Thursday	10.25	0.50	41	10 – 11
	Friday	10.00	0.00	40	10 – 10
	Saturday	11.00	1.41	44	10 - 13
Physical Activity	Monday	453.70	128.14	1814.80	273.24 – 556.46
	Tuesday	536.77	90.87	2147.09	458.48 – 626.28
	Wednesday	608.41	253.06	2433.63	262.44 – 870.48
	Thursday	554.01	129.33	2216.03	458.48 – 734.26
	Friday	446.44	98.91	1785.76	298.99 – 503.35
	Saturday	536.76	196.58	2147.06	273.24 – 704.35

Daily Descriptive Statistics for Participant #26

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	35.50	5.69	142	27 – 39
	Tuesday	27.82	12.97	111.28	10 – 40
	Wednesday	29.95	1.31	119.78	29 – 31.78
	Thursday	26.00	3.56	104	22 – 29
	Friday	27.25	3.69	109	23 – 32
	Saturday	26.00	4.08	104	22 – 30
Negative Affect	Monday	10.75	1.50	43	10 – 13
	Tuesday	10.15	0.30	40.59	10 – 10.59
	Wednesday	10.41	0.49	41.59	10 – 11
	Thursday	10.50	1.00	42	10 – 12
	Friday	10.50	1.00	42	10 – 12
	Saturday	11.00	1.15	44	10 - 12
Physical Activity	Monday	398.73	146.01	1594.93	267.29 – 604.88
	Tuesday	514.06	106.16	2056.26	409.85 – 620.08
	Wednesday	488.25	198.05	1953.01	237.26 – 689.43
	Thursday	494.06	337.20	1976.25	237.26 – 975.36
	Friday	631.45	679.36	2525.80	237.26 – 1648.65
	Saturday	759.90	697.13	3039.59	237.26 – 1772.02

Daily Descriptive Statistics for Participant #27

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	44.41	1.77	177.65	43 – 47
	Tuesday	45.08	1.34	180.33	44 – 47
	Wednesday	44.00	1.63	176	42 – 46
	Thursday	43.50	1.00	174	43 – 45
	Friday	45.00	2.31	180	43 – 47
	Saturday	41.50	1.91	166	39 - 43
Negative Affect	Monday	10.30	0.48	41.18	10 – 11
	Tuesday	10.00	0.00	40	10 – 10
	Wednesday	10.25	0.50	41	10 – 11
	Thursday	10.00	0.00	40	10 – 10
	Friday	10.00	0.00	40	10 – 10
	Saturday	10.00	0.00	40	10 - 10
Physical Activity	Monday	342.71	137.90	1370.85	200.31 – 531.36
	Tuesday	424.70	108.70	1698.81	303.56 – 552.04
	Wednesday	489.00	444.99	1956.01	200.31 – 1152.64
	Thursday	309.82	69.69	1239.28	225.03 – 390.55
	Friday	353.27	133.87	1413.10	212.67 – 498.19
	Saturday	298.36	71.73	1193.43	212.67 – 365.51

Daily Descriptive Statistics for Participant #28

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	29.25	2.99	117	25 – 32
	Tuesday	34.50	4.12	138	29 – 39
	Wednesday	36.00	8.91	144	26 – 44
	Thursday	40.00	1.83	160	38 – 42
	Friday	42.50	1.73	170	40 – 44
	Saturday	32.75	6.08	131	24 - 38
Negative Affect	Monday	10.50	1.00	42	10 – 12
	Tuesday	10.00	0.00	40	10 – 10
	Wednesday	11.50	1.91	46	10 – 14
	Thursday	10.00	0.00	40	10 – 10
	Friday	10.00	0.00	40	10 – 10
	Saturday	10.00	0.00	40	10 - 10
Physical Activity	Monday	256.38	85.45	1025.51	210.80 – 384.41
	Tuesday	369.69	284.36	1478.75	224.62 – 796.19
	Wednesday	457.16	112.11	1828.64	308.11 – 568.82
	Thursday	568.82	348.51	2275.27	238.43 – 905.81
	Friday	592.62	361.68	2370.49	269.67 – 1045.17
	Saturday	443.72	241.12	1774.88	247.14 – 795.27

Daily Descriptive Statistics for Participant #29

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	31.00	4.76	124	26 – 36
	Tuesday	32.25	3.86	129	30 – 38
	Wednesday	31.00	2.94	124	28 – 35
	Thursday	30.50	1.00	122	30 – 32
	Friday	30.50	1.00	122	30 – 32
	Saturday	30.00	0.00	120	30 - 30
Negative Affect	Monday	10.00	0.00	40	10 – 10
	Tuesday	10.75	1.50	43	10 – 13
	Wednesday	10.00	0.00	40	10 – 10
	Thursday	10.25	0.50	41	10 – 11
	Friday	10.00	0.00	40	10 – 10
	Saturday	10.00	0.00	40	10 - 10
Physical Activity	Monday	582.83	293.28	2331.30	257.14 – 879.87
	Tuesday	412.94	121.36	1651.75	257.14 – 540.32
	Wednesday	496.07	176.66	1984.29	257.14 – 629.74
	Thursday	707.24	113.26	2828.97	612.99 – 859.61
	Friday	601.11	250.91	2404.42	419.22 – 968.83
	Saturday	548.47	215.13	2193.90	257.14 – 726.63

Daily Descriptive Statistics for Participant #30

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	22.50	3.70	90	20 – 28
	Tuesday	24.50	5.97	98	17 – 31
	Wednesday	25.25	5.74	101	20 – 32
	Thursday	21.50	5.20	86	14 – 26
	Friday	19.25	3.50	77	14 – 21
	Saturday	17.87	6.41	71.48	10 - 25
Negative Affect	Monday	17.25	1.89	69	16 – 20
	Tuesday	16.00	3.92	64	12 – 21
	Wednesday	13.50	1.91	54	12 – 16
	Thursday	12.50	1.71	49	10 – 14
	Friday	11.75	0.50	47	11 – 12
	Saturday	13.63	2.87	54.52	10 - 17
Physical Activity	Monday	385.10	121.41	1540.39	257.06 – 540.37
	Tuesday	455.35	140.31	1821.38	304.04 – 613.86
	Wednesday	451.02	129.58	1804.09	304.04 – 614.72
	Thursday	398.93	119.43	1595.72	257.06 – 513.85
	Friday	390.21	190.21	1560.85	283.58 – 675.24
	Saturday	391.07	32.00	1564.29	371.48 – 438.92

Daily Descriptive Statistics for Participant #31

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	17.00	2.16	68	14 – 19
	Tuesday	14.25	1.71	57	12 – 16
	Wednesday	10.00	0.00	40	10 – 10
	Thursday	20.25	4.99	81	13 – 24
	Friday	16.00	3.92	64	12 – 21
	Saturday	11.00	2.00	44	10 - 14
Negative Affect	Monday	10.25	0.50	41	10 – 11
	Tuesday	10.75	1.50	43	10 – 13
	Wednesday	11.00	0.00	44	11 – 11
	Thursday	10.25	0.50	41	10 – 11
	Friday	10.25	0.50	41	10 – 11
	Saturday	10.00	0.00	40	10 - 10
Physical Activity	Monday	459.02	76.37	1836.08	388.51 – 533.14
	Tuesday	490.39	199.38	1961.55	323.74 – 778.47
	Wednesday	468.46	125.25	1873.85	373.67 – 653.00
	Thursday	495.79	50.55	1983.17	453.29 – 553.14
	Friday	752.85	334.90	3011.41	323.74 – 1052.42
	Saturday	438.44	83.31	1753.77	323.74 – 523.45

Daily Descriptive Statistics for Participant #32

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	16.25	0.50	65	16 – 17
	Tuesday	21.00	0.00	84	21 - 21
	Wednesday	21.00	1.41	84	20 – 23
	Thursday	16.75	3.77	67	10 – 11
	Friday	15.75	1.50	63	15 – 18
	Saturday	18.000	0.82	72	17 - 19
Negative Affect	Monday	10.25	0.50	41	10 – 11
	Tuesday	10.00	0.00	40	10 – 10
	Wednesday	10.00	0.00	40	10 – 10
	Thursday	10.25	0.50	41	10 – 11
	Friday	15.00	0.00	60	15 – 15
	Saturday	13.00	0.00	52	13 - 13
Physical Activity	Monday	342.65	76.68	1370.59	228.02 – 385.31
	Tuesday	389.26	23.32	1557.05	355.43 – 408.92
	Wednesday	369.60	30.88	1478.40	342.85 – 396.35
	Thursday	427.40	189.46	1709.59	272.06 – 657.45
	Friday	736.89	183.45	2947.54	588.25 – 1003.48
	Saturday	362.12	50.64	1448.48	298.81 – 421.50

Daily Descriptive Statistics for Participant #33

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	11.5	1.73	46	10 – 13
	Tuesday	11.75	1.71	47	10 – 14
	Wednesday	15.00	2.16	60	13 – 18
	Thursday	18.00	5.03	72	13 – 25
	Friday	11.25	0.96	45	10 – 12
	Saturday	19.50	3.70	78	14 - 22
Negative Affect	Monday	12.75	2.06	51	10 – 15
	Tuesday	10.75	0.96	43	10 – 12
	Wednesday	10.00	0.00	40	10 – 10
	Thursday	10.50	0.58	72	13 – 25
	Friday	11.75	1.50	47	11 – 14
	Saturday	11.50	3.00	46	10 - 16
Physical Activity	Monday	509.41	202.81	2037.65	246.44 – 716.70
	Tuesday	488.37	163.56	1953.49	276.14 – 617.14
	Wednesday	519.10	109.69	2076.42	383.67 – 646.84
	Thursday	613.64	86.30	2454.56	510.72 – 721.64
	Friday	657.91	104.35	2631.65	503.57 – 721.64
	Saturday	772.53	277.13	3090.12	473.87 – 1138.84

Daily Descriptive Statistics for Participant #34

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	25.25	1.26	101	24 – 27
	Tuesday	29.50	1.29	118	28 – 31
	Wednesday	21.75	4.57	87	17 – 27
	Thursday	22.75	4.79	91	16 – 27
	Friday	16.50	1.29	66	15 – 18
	Saturday	19.25	4.57	77	14 - 25
Negative Affect	Monday	10.00	0.00	40	10 – 10
	Tuesday	10.00	0.00	40	10 – 10
	Wednesday	10.00	0.00	40	10 – 10
	Thursday	10.00	0.00	40	10 – 10
	Friday	10.75	0.96	43	10 – 12
	Saturday	10.00	0.00	40	10 - 10
Physical Activity	Monday	511.10	287.89	2044.36	215.93 – 842.25
	Tuesday	346.62	101.58	1386.49	215.93 – 459.28
	Wednesday	412.01	87.74	1648.04	315.14 – 522.31
	Thursday	303.85	50.00	1215.39	229.46 – 33.15
	Friday	473.94	218.28	1895.77	215.93 – 720.61
	Saturday	434.57	128.37	1738.27	306.09 – 612.61

Daily Descriptive Statistics for Participant #35

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	31.50	2.52	126	28 – 34
	Tuesday	30.75	2.75	123	28 – 34
	Wednesday	34.25	4.65	137	30 – 40
	Thursday	37.25	3.20	149	34 – 40
	Friday	35.00	2.16	140	32 – 37
	Saturday	40.25	3.10	161	36 - 43
Negative Affect	Monday	10.00	0.00	40	10 – 10
	Tuesday	10.00	0.00	40	10 – 10
	Wednesday	10.00	0.00	40	10 – 10
	Thursday	10.00	0.00	40	10 – 10
	Friday	10.00	0.00	40	10 – 10
	Saturday	10.00	0.00	40	10 - 10
Physical Activity	Monday	302.27	44.97	1209.10	236.94 – 339.89
	Tuesday	336.97	138.58	1347.87	190.65 – 524.95
	Wednesday	298.14	119.70	1192.56	190.65 – 459.29
	Thursday	309.31	94.90	1237.22	190.65 – 411.54
	Friday	271.63	54.59	1086.53	190.65 – 310.05
	Saturday	790.43	401.35	3161.70	399.55 – 1267.80

Daily Descriptive Statistics for Participant #36

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	33.50	1.91	134	32 – 36
	Tuesday	30.25	3.20	121	27 – 33
	Wednesday	26.75	1.26	107	25 – 28
	Thursday	34.25	0.96	137	33 – 35
	Friday	33.75	0.96	135	33 – 35
	Saturday	25.50	3.00	102	21 - 27
Negative Affect	Monday	11.00	0.00	44	11 – 11
	Tuesday	10.25	0.50	41	10 – 11
	Wednesday	10.25	0.50	41	10 – 11
	Thursday	10.75	1.50	43	10 – 13
	Friday	12.75	1.26	51	11 – 14
	Saturday	14.00	0.82	56	13 - 15
Physical Activity	Monday	575.66	334.35	2302.66	212.30 – 895.58
	Tuesday	690.74	533.37	2762.94	224.68 – 1152.64
	Wednesday	355.06	99.47	1420.25	212.30 – 435.74
	Thursday	298.24	125.17	1192.95	212.30 – 481.64
	Friday	439.01	191.13	1756.04	212.30 – 626.36
	Saturday	718.71	344.10	2874.83	212.30 – 974.52

Daily Descriptive Statistics for Participant #37

Variable	Day	Mean	Standard Deviation	Total	Range
Positive Affect	Monday	18.25	6.13	73	12 – 26
	Tuesday	20.00	2.16	80	18 – 23
	Wednesday	24.00	1.83	96	22 – 26
	Thursday	21.00	4.76	84	18 – 28
	Friday	22.50	5.20	90	15 – 27
	Saturday	24.58	2.91	98.32	22 - 28
Negative Affect	Monday	10.75	0.96	43	10 – 12
	Tuesday	13.00	2.45	52	11 – 16
	Wednesday	11.75	1.50	47	11 – 14
	Thursday	15.00	5.35	60	10 – 21
	Friday	18.5	4.92	73	14 – 23
	Saturday	13.07	0.93	52.27	12 – 14.27
Physical Activity	Monday	345.37	66.52	1381.48	281.80 – 428.27
	Tuesday	599.63	284.97	2398.52	315.14 – 992.78
	Wednesday	337.22	69.90	1348.87	260.88 – 428.71
	Thursday	334.11	120.20	1336.46	260.88 – 511.97
	Friday	492.27	181.92	1969.07	260.88 – 660.89
	Saturday	707.81	487.64	2831.23	260.88 – 1281.37

Appendix S

Individual Affect and Physical Activity Descriptives by Time of Day

Descriptive Statistics by Time of Day for Participant #1

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	17.17	7.68	103	10-27
	1200	28.68	5.68	172	21-35
	1600	28.68	4.72	172	25-38
	2000	29.17	6.18	175	18-35
Negative Affect	0800	14.50	6.44	87	10-25
	1200	21	11.73	126	10-38
	1600	17	13.91	102	10-45
	2000	16.50	9.71	99	10-30
Energy Expenditure	0800	234.17	56.68	1405.02	211.03-349.87
	1200	285.89	31.59	1715.35	231.72-327.43
	1600	301.72	68.01	1810.33	225.58-422.62
	2000	289.72	19.90	1738.34	258.62-318.21

Descriptive Statistics by Time of Day for Participant #2

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	20.26	4.07	121.58	14-26
	1200	23	5.10	138	19-32
	1600	22.41	5.39	134.48	18-29
	2000	24.15	3.31	144.91	21-30
Negative Affect	0800	11.38	1.74	68.30	10-14
	1200	11.67	2.25	70	10-15
	1600	10.14	.33	60.81	10-10.81
	2000	10.02	.06	60.14	10-10.14
Energy Expenditure	0800	268.20	69.61	1609.20	226.74-403.65
	1200	402.48	146.65	2414.88	290.42-690.34
	1600	391.27	108.85	2347.62	290.42-523.94
	2000	396.45	107.67	2378.72	297.49-577.07

Descriptive Statistics by Time of Day for Participant #3

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	23.70	5.65	142.18	14-31
	1200	26.33	6.86	158	14-34
	1600	29.14	8.14	174.84	16-37
	2000	29.14	7.08	174.84	21-40
Negative Affect	0800	10.27	.44	61.62	10-11
	1200	13.50	2.66	81	10-17
	1600	14.94	5.52	89.62	10-22
	2000	11.44	1.50	68.62	10-14
Physical Activity	0800	303.58	60.62	1821.50	269.80-419.51
	1200	374.75	93.41	2248.49	269.80-548.66
	1600	502.21	156.80	3013.23	317.51-725.51
	2000	629.64	379.31	3777.82	341.37-1357.26

Descriptive Statistics by Time of Day for Participant #4

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	13.17	7.76	79	10-29
	1200	34.83	10.19	209	18-47
	1600	35.33	5.79	212	28-45
	2000	30.50	3.51	183	27-36
Negative Affect	0800	10	.000	60	10-10
	1200	13.17	4.71	79	10-21
	1600	12.83	5.49	77	10-24
	2000	11.17	1.47	67	10-14
Energy Expenditure	0800	333.07	92.02	1998.40	295.50-1998.40
	1200	1019.88	369.73	6119.27	489.70-1459.44
	1600	740.77	269.07	4444.64	414.57-1141.70
	2000	565.94	126.76	3395.64	440.03-734.83

Descriptive Statistics by Time of Day for Participant #5

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	19.33	4.84	116	12-25
	1200	21.14	5.35	126.85	16-29
	1600	17.33	4.55	104	12-23
	2000	19.17	2.93	115	16-24
Negative Affect	0800	12.33	1.63	74	10-15
	1200	12.98	2.68	77.89	10-17
	1600	10.83	1.60	65	10-14
	2000	12.83	3.54	77	10-19
Physical Activity	0800	259.49	105.02	1556.95	192.34-416.48
	1200	411.65	154.52	2469.90	192.34-655.74
	1600	283.40	82.02	1700.43	219.49-444.40
	2000	387.07	153.89	2322.44	192.34-575.86

Descriptive Statistics by Time of Day for Participant #6

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	21.50	8.12	129	12-32
	1200	31.33	5.05	188	10-14
	1600	29.73	9.11	178.35	20-45
	2000	26.70	6.50	160.17	19-35
Negative Affect	0800	11.67	1.51	70	10-14
	1200	12	1.90	72	10-14
	1600	12.20	.75	73.20	11-13
	2000	13.33	5.32	80	10-24
Physical Activity	0800	250.93	78.42	1505.57	201.30-374.65
	1200	678.50	229.88	4070.97	405.09-1081.08
	1600	560.27	221.14	3361.61	316.87-944.08
	2000	384.31	95.81	2305.85	248.21-536.81

Descriptive Statistics by Time of Day for Participant #7

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	33.17	4.54	199	28-39
	1200	33	3.41	198	27-37
	1600	34.38	7.53	206.27	21-42
	2000	34	3.58	204	28-39
Negative Affect	0800	12.50	2.17	75	10-15
	1200	13.83	4.83	83	10-23
	1600	11.61	1.63	69.68	10-14
	2000	10.33	.82	62	10-12
Energy Expenditure	0800	495.36	173.37	2972.14	208.96-688.54
	1200	410.20	109.91	2461.19	296.20-615.70
	1600	383.22	116.91	2299.30	235.75-557.94
	2000	296.43	52.97	1778.57	208.96-343.60

Descriptive Statistics by Time of Day for Participant #8

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	26	5.02	156	19-34
	1200	28.83	4.71	173	22-35
	1600	29	4.77	174	23-35
	2000	32.67	3.83	196	26-37
Negative Affect	0800	13.33	2.50	80	11-18
	1200	11.50	1.97	69	10-15
	1600	11.83	1.47	71	10-14
	2000	13.83	4.88	83	10-21
Energy Expenditure	0800	233.67	18.74	1402.04	221.71-262
	1200	454.26	213.80	2725.56	221.71-789.66
	1600	408.50	103.25	2451.01	273.34-561.72
	2000	395.07	176.01	2370.42	221.71-725.42

Descriptive Statistics by Time of Day for Participant #9

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	16.30	3.44	97.77	11-21
	1200	21	7.38	126	13-32
	1600	20.67	3.78	124	16-26
	2000	20	4.24	120	13-24
Negative Affect	0800	14.03	2.76	84.20	11-19
	1200	16.17	4.98	90	10-24
	1600	15	4.98	90	10-24
	2000	15.33	3.78	92	12-22
Energy Expenditure	0800	192.67	33.80	1156.03	175.77-260.28
	1200	259.72	66.53	1558.32	214.65-392.12
	1600	229.72	30.76	1378.31	187.60-276.34
	2000	232.68	68.93	1396.05	175.77-368.46

Descriptive Statistics by Time of Day for Participant #10

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	34	1.90	204	32-37
	1200	32.74	1.06	196.42	31-34
	1600	33.83	3.43	203	31-38
	2000	34.67	1.17	207.96	33-36
Negative Affect	0800	13.67	2.88	82	11-18
	1200	13.64	2.31	81.84	10-17
	1600	11.33	2.16	68	10-15
	2000	11.62	1.35	69.70	10-13
Energy Expenditure	0800	195.63	11.59	1173.80	190.90-219.30
	1200	378.44	95.12	2270.64	190.90-450.28
	1600	881.65	840.92	5289.92	382.87-2578.09
	2000	439.91	68.90	2639.44	361.28-557.42

Descriptive Statistics by Time of Day for Participant #11

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	14.50	2.43	87	11-18
	1200	15.67	3.67	94	10-21
	1600	15.67	3.44	90	12-22
	2000	15	1.10	90	14-17
Negative Affect	0800	11	2.00	66	10-15
	1200	10.67	1.21	64	10-13
	1600	10.17	.41	61	10-11
	2000	10	.000	60	10-10
Energy Expenditure	0800	254.47	.000	1526.82	254.47-254.47
	1200	403.92	133.63	2423.51	254.47-654.67
	1600	378.94	42.58	2273.64	313.91-442.01
	2000	435.60	165.61	2613.57	288.80-730.02

Descriptive Statistics by Time of Day for Participant #12

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	21.73	1.77	130.36	19-24
	1200	29.67	4.63	178	22-36
	1600	28.92	8.67	173.52	18-43
	2000	24	7.87	144	11-33
Negative Affect	0800	10.80	.98	64.77	10-12
	1200	10.50	1.22	63	10-13
	1600	11.19	1.60	67.11	10-14
	2000	10.17	.41	61	10-11
Energy Expenditure	0800	265.44	37.65	1592.61	232.73-315.09
	1200	500.95	211.32	3005.69	232.73-865.05
	1600	368.89	85.16	2213.32	232.73-436.18
	2000	288.17	74.44	1729.01	232.73-395.82

Descriptive Statistics by Time of Day for Participant #13

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	32	4.29	192	25-37
	1200	34.33	3.83	206	30-39
	1600	34.83	6.55	209	29-42
	2000	33.67	5.54	202	28-42
Negative Affect	0800	10.17	.41	61	10-11
	1200	10	.000	60	10-10
	1600	10.67	1.63	64	10-14
	2000	10	.000	64	10-10
Energy Expenditure	0800	259.87	81.48	1559.23	194.40-419.80
	1200	532.84	122.49	3197.06	421.48-715.09
	1600	429.58	103.73	2577.49	335.84-558.48
	2000	368.30	109.19	2209.80	265.12-546.33

Descriptive Statistics by Time of Day for Participant #14

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	45.83	3.25	275	40-48
	1200	37.80	12.46	226.80	16-49
	1600	44.80	2.99	268.80	40-48
	2000	45.50	2.81	273	42-48
Negative Affect	0800	11.50	3.67	69	10-19
	1200	12.20	2.40	73.20	10-16
	1600	11.60	3.20	69.60	10-18
	2000	45.50	2.81	273	10-14
Energy Expenditure	0800	208.20	21.62	1249.21	188.11-250.21
	1200	305.45	62.39	1832.71	213.28-376.38
	1600	210.37	19.76	1262.22	188.11-245.74
	2000	217.94	24.88	1307.66	188.11-259.15

Descriptive Statistics by Time of Day for Participant #15

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	22	8.53	132	11-31
	1200	29.83	3.66	179	24-33
	1600	24.33	4.08	146	20-30
	2000	22.68	3.93	136.06	15-26
Negative Affect	0800	15.50	4.55	93	11-22
	1200	12.33	1.86	74	10-14
	1600	12.67	2.73	76	10-17
	2000	11.44	1.96	68.63	10-15
Energy Expenditure	0800	480.99	214.56	2885.95	263.02-793.25
	1200	936.11	510.39	5616.68	482.71-1854.60
	1600	760.51	154.75	4563.06	524.24-923.85
	2000	671.09	160.89	4026.56	524.24-956.73

Descriptive Statistics by Time of Day for Participant #16

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	30.83	4.62	185	26-37
	1200	28.67	3.61	172	25-33
	1600	25	1.10	150	24-27
	2000	27.67	6.10	166	22-37
Negative Affect	0800	12.67	1.75	76	10-14
	1200	16.17	5.15	97	11-26
	1600	16.33	7.55	98	10-26
	2000	11.83	6.10	71	10-20
Energy Expenditure	0800	587.99	115.44	3527.92	475.45-778.53
	1200	613.89	99.28	3683.35	444.78-732.49
	1600	739.82	422.89	4438.92	552.22-1601.16
	2000	792.85	325.61	4757.13	504.24-1336.52

Descriptive Statistics by Time of Day for Participant #17

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	39.17	2.23	235	36-42
	1200	40.17	.41	241	40-41
	1600	41	2.45	246	40-46
	2000	40.33	.52	242	40-41
Negative Affect	0800	10	.000	60	10-10
	1200	10	.000	60	10-10
	1600	10	.000	60	10-10
	2000	11	2.45	66	10-16
Energy Expenditure	0800	279.52	40.85	1677.14	231.67-353.88
	1200	305.60	116.80	1827.58	231.67-533.03
	1600	275.88	68.83	1655.30	231.67-374.99
	2000	342.84	93.84	2057.03	231.67-461.37

Descriptive Statistics by Time of Day for Participant #18

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	17.83	6.08	107	10-28
	1200	20.63	3.32	123.75	18-27
	1600	19.50	4.89	117	11-25
	2000	22.92	2.37	137.52	20-27
Negative Affect	0800	12	2.53	72	10-17
	1200	12.34	1.32	74.04	10-14
	1600	12.83	3.37	77	10-18
	2000	12.21	2.99	73.23	10-18
Energy Expenditure	0800	277.18	78.02	1663.06	214.38-426.25
	1200	382.28	136.48	2293.67	248.08-624.99
	1600	403.45	165.39	2420.73	258.16-712.42
	2000	286.13	22.76	1716.81	268.24-328.87

Descriptive Statistics by Time of Day for Participant #19

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	23	3.69	138	19-27
	1200	26	2.61	156	22-29
	1600	25.50	2.81	153	21-29
	2000	23.17	3.76	139	18-27
Negative Affect	0800	10.67	1.03	64	10-12
	1200	10	.000	60	10-10
	1600	10.17	.41	61	10-11
	2000	10.17	.41	61	10-11
Energy Expenditure	0800	248.68	17.22	1492.10	231.80-278.83
	1200	497.18	255.47	2983.05	231.80-901.33
	1600	546	245.38	3275.99	325.87-912.10
	2000	301.74	56.12	1810.44	231.80-376.50

Descriptive Statistics by Time of Day for Participant #20

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	30.83	3.37	185	27-37
	1200	29.50	3.27	177	24-34
	1600	30.17	2.04	181	27-33
	2000	28.17	3.25	169	24-31
Negative Affect	0800	10.67	.82	64	10-12
	1200	10.83	1.60	65	10-14
	1600	10.33	.82	62	10-12
	2000	10.17	.41	61	10-11
Energy Expenditure	0800	324.72	50.03	1948.30	256.65-363.34
	1200	257.58	77.56	1545.45	203.31-379.44
	1600	297.73	69.69	1786.38	225.33-382.84
	2000	385.31	173.26	2311.89	225.33-635.21

Descriptive Statistics by Time of Day for Participant #21

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	26	4.10	156	21-31
	1200	30.50	4.14	183	24-37
	1600	23.50	3.99	141	21-31
	2000	24.17	4.96	145	19-32
Negative Affect	0800	11.17	1.33	67	10-13
	1200	11.50	2.07	69	10-15
	1600	10.33	.82	62	10-12
	2000	10	.000	60	10-10
Energy Expenditure	0800	322.93	43.81	1937.60	275.76-378.11
	1200	684.55	449.57	4107.29	380.23-1463.25
	1600	571.82	267.61	3430.93	384.18-1082.40
	2000	389.24	35.93	2335.46	354.12-446.44

Descriptive Statistics by Time of Day for Participant #22

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	17.50	3.45	104.99	13-23
	1200	22.83	5.95	137	13-30
	1600	19.33	3.72	116	13-23
	2000	23.67	10.41	142	14-42
Negative Affect	0800	10.41	.80	62.43	10-12
	1200	10.50	1.22	63	10-13
	1600	10.50	.84	63	10-12
	2000	10.83	.75	65	10-12
Energy Expenditure	0800	365.05	66.10	2190.32	326.32-486.34
	1200	622.44	165.60	3734.65	396.13-816.20
	1600	803.06	391.60	4818.34	414.57-1482.57
	2000	577.99	181.03	3467.95	379.66-867.58

Descriptive Statistics by Time of Day for Participant #23

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	19.33	1.75	116	16-21
	1200	23.83	5.08	143	18-30
	1600	22.33	3.50	134	18-28
	2000	21.48	.75	128.87	20-22
Negative Affect	0800	11.50	1.64	69	10-14
	1200	12.67	2.50	76	10-17
	1600	11.50	1.64	69	10-13
	2000	11.00	.55	66.01	10-11.67
Energy Expenditure	0800	280.02	44.79	1680.10	226.95-334.39
	1200	710.78	551.36	4264.70	280.67-1805.96
	1600	664.36	211.51	3986.14	486.80-1072.59
	2000	628.32	310.60	3769.89	367.59-1231.34

Descriptive Statistics by Time of Day for Participant #24

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	22.83	2.48	137	20-26
	1200	27.17	2.04	163	26-31
	1600	26	1.79	156	24-29
	2000	21.67	3.56	130	16-27
Negative Affect	0800	10.33	.82	62	10-12
	1200	10.50	.84	63	10-11
	1600	10.17	.41	61	10-11
	2000	10.50	.84	63	10-12
Energy Expenditure	0800	319	74.91	1914.02	240.48-440.96
	1200	474.80	123.99	2848.81	319-663.16
	1600	467.84	146.11	2807.03	354.09-756.71
	2000	451.69	78.76	2710.17	349.92-544.57

Descriptive Statistics by Time of Day for Participant #25

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	21.67	4.50	130	15-26
	1200	25.67	3.20	154	21-29
	1600	25	3.90	150	18-29
	2000	20.83	2.56	125	18-24
Negative Affect	0800	10.50	.55	63	10-11
	1200	11.33	2.16	68	10-15
	1600	11.50	3.67	69	10-19
	2000	10	.000	60	10-10
Energy Expenditure	0800	368.21	108.30	2209.27	262.44-480.07
	1200	610.91	146.91	3665.44	458.48-870.48
	1600	624.34	96.01	3746.02	503.35-734.26
	2000	487.27	115.57	2923.64	298.99-639.56

Descriptive Statistics by Time of Day for Participant #26

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	28.50	6.57	171	22-38
	1200	32.30	6.66	193.78	22-40
	1600	27.17	9.24	163	10-38
	2000	27.05	2.19	162.28	23-29
Negative Affect	0800	10.67	1.03	64	10-12
	1200	10.60	1.20	63.59	10-13
	1600	10.33	.82	62	10-12
	2000	10.60	.80	63.59	10-12
Energy Expenditure	0800	271.03	69.06	1626.19	237.26-409.85
	1200	714.96	484.90	4289.78	286.11-1648.65
	1600	784.92	530.61	4709.54	334.96-1772.02
	2000	420.05	106.27	2520.31	304.93-593.66

Descriptive Statistics by Time of Day for Participant #27

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	43.88	2.79	263.33	39-47
	1200	44.33	2.34	266	41-47
	1600	43.61	.80	261.65	43-45
	2000	43.83	1.83	263	42-47
Negative Affect	0800	10	.000	60	10-10
	1200	10	.000	60	10-10
	1600	10.20	.40	61.18	10-11
	2000	10.17	.41	61	10-11
Energy Expenditure	0800	267.17	139.86	1603.02	200.31-552.04
	1200	552.04	302.20	3312.21	365.51-1152.64
	1600	321.24	75.82	1928.06	266.33-469.25
	2000	338.03	49.54	2028.19	299.50-461.69

Descriptive Statistics by Time of Day for Participant #28

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	35	5.72	210	26-42
	1200	38.17	5.19	229	30-44
	1600	36.33	7.81	218	24-44
	2000	33.83	7.00	203	25-43
Negative Affect	0800	10.33	.82	62	10-12
	1200	10	.000	60	10-10
	1600	10.67	1.63	64	10-14
	2000	10.33	.82	62	10-12
Energy Expenditure	0800	273.62	46.44	1641.73	219.51-334.24
	1200	698.16	293.33	4188.99	210.80-1045.17
	1600	365.63	196.21	2193.79	210.08-721.40
	2000	454.84	250.95	2729.02	224.62-905.81

Descriptive Statistics by Time of Day for Participant #29

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	30	1.26	180	28-32
	1200	31.83	4.22	191	26-38
	1600	31.33	2.34	188	30-36
	2000	30.33	1.97	182	28-34
Negative Affect	0800	10.17	.41	61	10-11
	1200	10	.000	60	10-10
	1600	10.50	1.22	63	10-13
	2000	10	.000	60	10-10
Energy Expenditure	0800	435.06	297.72	2610.38	257.14-968.83
	1200	541.87	120.51	3251.24	419.22-726.63
	1600	647.06	143.52	3882.35	467.66-879.87
	2000	608.44	193.40	3650.66	386.62-859.61

Descriptive Statistics by Time of Day for Participant #30

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	19.50	4.85	117	10-23
	1200	24.83	4.22	149	21-32
	1600	22.67	5.16	136	16-31
	2000	20.25	6.46	121.48	14-28
Negative Affect	0800	14.33	3.61	86	10-20
	1200	13.83	2.23	83	12-17
	1600	14.67	3.98	88	10-21
	2000	13.42	1.96	80.52	12-17
Energy Expenditure	0800	299.62	42.06	1797.73	257.06-371.48
	1200	532.30	104.85	3193.77	377.53-675.24
	1600	445.59	123.09	2673.56	283.58-614.72
	2000	370.27	43.60	2221.65	297.99-412.40

Descriptive Statistics by Time of Day for Participant #31

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	16.33	4.41	98	10-21
	1200	15	5.44	90	10-24
	1600	15.17	5.12	91	10-23
	2000	12.50	2.35	75	10-16
Negative Affect	0800	10.17	.41	61	10-21
	1200	11.17	.98	67	10-13
	1600	10.17	.41	61	10-11
	2000	10.17	.41	61	10-11
Energy Expenditure	0800	422.70	65.47	2536.18	323.74-523.45
	1200	561.68	290.35	3370.10	323.74-1052.42
	1600	608.92	195.19	3653.50	453.29-982.25
	2000	476.68	113.35	2860.05	323.74-653

Descriptive Statistics by Time of Day for Participant #32

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	18.83	2.99	113	15-23
	1200	18.50	2.59	111	15-21
	1600	17.33	2.80	104	14-21
	2000	17.83	2.93	107	13-21
Negative Affect	0800	11.33	2.16	68	10-15
	1200	11.50	2.07	69	10-15
	1600	11.50	2.07	69	10-15
	2000	11.33	2.16	68	10-15
Energy Expenditure	0800	405.77	132.95	2434.62	272.06-657.45
	1200	461.34	269.64	2768.07	272.06-1003.48
	1600	438.94	88.95	2633.62	371.94-588.25
	2000	445.89	191.06	2675.33	228.02-698.36

Descriptive Statistics by Time of Day for Participant #33

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	14.67	3.72	88	11-21
	1200	14.50	4.76	87	10-21
	1600	13.33	4.46	80	10-22
	2000	15.50	4.76	93	12-25
Negative Affect	0800	11.50	1.87	69	10-15
	1200	10.67	1.21	64	10-13
	1600	11.67	2.42	70	10-16
	2000	11	1.55	66	10-14
Energy Expenditure	0800	493.17	156.24	2859.01	276.14-716.70
	1200	660.36	112.14	3962.19	467.53-787.38
	1600	648.45	289.55	3890.70	246.44-1138.84
	2000	572	103.89	3432	443.07-690.03

Descriptive Statistics by Time of Day for Participant #34

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	22.33	5.72	93	12-25
	1200	24	4.65	144	18-30
	1600	23	4.77	138	17-29
	2000	20.67	6.38	124	14-28
Negative Affect	0800	10	.000	60	10-10
	1200	10.33	.82	62	10-12
	1600	10.17	.41	61	10-11
	2000	10	.000	60	10-10
Energy Expenditure	0800	478.87	161.62	2873.19	229.46-653.10
	1200	530.61	213.44	3183.70	306.09-842.25
	1600	333.13	68.36	1998.70	215.93-409.78
	2000	312.11	81.14	1872.66	215.93-409.78

Descriptive Statistics by Time of Day for Participant #35

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	35.83	3.60	215	32 – 40
	1200	37.83	3.37	227.00	34 – 42
	1600	34.17	5.19	205	28 – 43
	2000	31.50	3.08	189	28 - 36
Negative Affect	0800	10.00	0.00	60	10 – 10
	1200	10.00	0.00	60	10 – 10
	1600	10.00	0.00	60	10 – 10
	2000	10.00	0.00	60	10 - 10
Energy Expenditure	0800	290.88	143.08	1745.30	190.65 – 524.87
	1200	476.69	388.03	2860.15	292.14 – 1257.80
	1600	403.59	279.34	2421.52	226.48 – 969.49
	2000	368.00	119.77	2208.00	190.65 – 524.95

Descriptive Statistics by Time of Day for Participant #36

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	29.17	5.15	175	21 – 35
	1200	31.17	2.93	187	27 – 34
	1600	31.67	3.67	190	27 – 35
	2000	30.67	4.59	184	25 - 36
Negative Affect	0800	11.33	1.37	68	10 – 13
	1200	11.50	2.07	69	10 – 15
	1600	11.50	1.97	69	10 – 14
	2000	11.67	1.51	70	10 - 14
Energy Expenditure	0800	214.37	5.05	1286.19	212.30 – 224.68
	1200	616.81	353.63	3700.88	353.05 – 1152.64
	1600	676.85	315.76	4061.09	274.33 – 1152.64
	2000	543.58	302.47	3261.50	224.68 – 895.58

Descriptive Statistics by Time of Day for Participant #37

Variable	Time (n = 6)	Mean	Standard Deviation	Total	Range
Positive Affect	0800	22.39	5.46	134.32	12 – 28
	1200	23.67	2.94	142	20 – 26
	1600	21.67	5.20	130	15 – 28
	2000	19.17	2.71	115	15 - 22
Negative Affect	0800	14.38	4.76	86.27	10 – 23
	1200	13.00	4.43	78	11 – 22
	1600	12.83	2.93	77	10 – 18
	2000	14.33	3.61	115	15 - 22
Energy Expenditure	0800	326.05	61.64	1956.31	260.88 – 436.06
	1200	348.59	106.32	2091.55	260.88 – 511.97
	1600	507.92	268.99	3047.55	260.88 – 941.69
	2000	695.03	365.23	4170.21	344.58 – 1281.37