The Effects of an Intervention to Foster a Caring and Task-Involving Climate at a University Recreation Center

By
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1

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Abstract

Specific links between social contexts, physical activity motivation and psychological outcomes have received minimal attention in the exercise domain, yet might help explain individuals' decisions whether to engage in exercise. Two theoretical frameworks that may further an understanding of exercise behavior are Achievement Goal Perspective Theory (AGPT; Nicholls, 1984; 1989) and Self-Determination Theory (SDT; Deci & Ryan, 1985, 1991); however little research has combined the theoretical tenants of each to explore how they influence each other. Therefore, the purpose of this study was to combine AGPT and SDT by examining participants' experiences while exercising at a campus recreation center both before and after an intervention with the recreation center staff .The intervention was designed to enhance members' perceptions of a caring and task-involving environment at the recreation center. The pre/post questionnaires completed by members (N= 779, $\bar{x}$ = 20.33, sd = 3.31) included measures of the following: a) climate (e.g. perceptions of the caring, task-, and ego-involving climates), b) psychological needs (e.g. autonomy, competence, and relatedness), c) motivational responses (e.g. extrinsic and intrinsic motivation), d) commitment to exercise and e) psychological well-being (e.g. satisfaction with life, positive and negative mood states and satisfaction-dissatisfaction with body image).

The research questions and hypotheses were presented in three different papers, each targeting a different aspect of the overall study design. The purpose of Study 1 was to validate the psychometric properties of a newly created instrument, known as the Perceived Motivational Climate in Exercise Settings (PMCEQ; Huddleston, Fry & Brown, 2011), designed to assess motivational climates in exercise settings. Using confirmatory factor analysis, the factor structure of the PMCEQ was established. In addition, both the caring climate and positive and negative mood states were used to establish concurrent validity with the instrument. Results revealed

support for a 27-item version of the PMCEQ.

The purpose of Study 2 was to (a) test a model examining whether psychological needs mediated the relationship between exercise participants' perceptions of the climate to their self-determined motivation and (b) test whether self-determined motivation for exercise predicted the basic psychological needs and commitment to exercise, body image and satisfaction with life. Results revealed support for the model, with the change in climate predicting the basic psychological needs, the change in basic psychological needs predicting self-determined motivation and finally the change in self-determined motivation predicting the well-being measures. The final structural model demonstrated a tenable fit (χ^2 (1928, n = 779) =6205.722, p <.001, RMSEA = .053, SRMR = .061, TLI = 0.876, CFI = 0.888). Results suggest that theoretical tenants of AGPT might be an antecedent to SDT and provide insight into the mechanisms by which well-being is influenced by exercise climates.

The purpose of Study 3 was to assess the relationship between perceptions of staff behaviors and members' behaviors in a recreation center facility. Perceptions of a caring, task-involving climate were examined as the mediator between staffs' and members' behaviors. The staff's and members' behaviors were considered from the members' perspective. Results revealed that the intervention did increase perceptions of the caring and task-involving climate while reducing perceptions of the ego-involving climate. The final model demonstrated acceptable fit (χ^2 (378, n = 779)= 1462.277, p = <.001, RMSEA = .061, SRMR=.045, TLI = 0.948, CFI = 0.955), and indicated that staff behaviors predicted perceptions of the task-involving (β = .32, p = .00), ego-involving (β = .19, p = .00) and caring climates (β = .30, p = .00). Likewise, perceptions of the ego-involving climate negatively predicted members' behaviors (β = -1.01, p = .00). Neither perceptions of the task-involving, caring climate nor staff

behaviors significantly predicted members' post-intervention behaviors. Results offer suggestions for recreation center staff behaviors to influence members' exercise experiences.

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Table of Contents

The Psychometric Properties of the Perceived Motivational Climate in Exercise Questionnaire

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Abstract

Given the potential benefits of understanding how the climate may influence individuals' motivational outcomes, there exists a need for instrumentation measuring exercise setting climates. Therefore, the purpose of this study was to validate the psychometric properties of a newly created instrument, known as the Perceived Motivational Climate in Exercise Settings (PMCEQ; Huddleston, Fry & Brown, 2011), designed to assess motivational climates in exercise settings. Current members of a university recreation center (N= 779, $\bar{x}$ = 20.33, sd = 3.31) were asked to complete a survey which included their perceptions of the task- and ego-involving climate, caring climate and positive and negative mood states. Using confirmatory factor analysis, the factor structure of the PMCEQ was established. In addition, both the caring climate and positive and negative mood states were used to establish concurrent validity with the instrument. Results revealed support for a 27-item version of the PMCEQ. Implications for the need for the PMCEQ in exercise settings are discussed.

The Psychometric Properties of the Perceived Motivational Climate in Exercise Questionnaire

Chronic diseases in the United States (US) have reached epidemic proportions and will likely continue to promote poorer quality of life and higher mortality rates (Colagiuri, Colagiuri, Yach & Pramming, 2006; Newman, Steed & Mulligan, 2004). Over one third of all deaths in the US can be attributed to unhealthy lifestyles, and therefore the Centers for Disease Control and Prevention (CDC) has identified lack of physical activity as one of the three high-risk health behaviors ("State of Aging and Health in America", 2007). Surprisingly, less than a third of adults report engaging in regular physical activity (Schoenborn, et al., 2004). Given the high percentage of adults who are sedentary and the links between physical inactivity and morbidity and mortality, increasing exercise habits has been named one of the goals of Healthy People 2010. Unfortunately only one half of exercise participants are likely to continue with a structured exercise program beyond the first 6 months of enrollment (Craig et al., 1999). Based on the importance of exercise to individuals' health and well-being and the number of people who are unsuccessful at maintaining a regular fitness regime, an important area of research investigates individuals' experiences in fitness facilities. One approach for influencing physical activity behavior is to consider individuals' perceptions of the climate within exercise settings and their mood states (Roberts, 1992; Duda 1993), which can be extremely beneficial for exercise leaders interested in maximizing individuals' involvement.

A wealth of research has been conducted examining motivational climates in achievement settings such as sport and physical activity (see Roberts, 2001 for a review). Researchers employing Nicholls' Achievement Goal Perspective Theory (AGPT; 1984, 1989) have examined how individuals interpret personal success in various achievement contexts such

as physical activity. Nicholls contended that individuals in achievement settings strive to demonstrate competence and can be either task- or ego-involved at any moment in time. Individuals who are highly task-involved perceive they are successful when they try their best and make improvements to their performance (i.e., employ self-referenced criteria). Conversely, highly ego-involved individuals perceive success when they outperform others or perform equally with less effort.

Nicholls (1984; 1989) argued, and research has revealed, that individuals' goal perspectives can be influenced by their perceptions of the motivational climate (Dweck & Leggert, 1988). According to Nicholls, motivational climates can be perceived as either task- or ego-involving. A task-involving climate has been defined as one in which individuals' perceive their best efforts are encouraged and recognized, cooperation is fostered and everyone plays an important role (feels valued and welcomed). Conversely, in ego-involving climates individuals perceive that only participants with superior ability are recognized and valued, and negative attention is drawn to those who make mistakes (Newton, Duda & Yin, 2000; Nicholls, 1989). Nicholls maintained that perceptions of a task-involving climate were more conducive to overall positive experiences with a given activity whereas perceptions of an ego-involving climate could be detrimental to individuals' overall experiences. Motivational climates have received considerable attention in both the pedagogy and sport psychology literature and have revealed consistently the benefits of teachers and coaches creating a task-involving climate (e.g., Biddle, 1999; Miller, Roberts & Ommundsen, 2004; Papaioannou, Marsh & Theodorakis, 2004; Pensgaard & Roberts, 2002).

With regard to assessing individuals' perceptions of the climate, Seifriz, Duda and Chi (1992) created the Perceived Motivational Climate in Sport Questionnaire (PMCSQ) to measure

individuals' perceptions of the motivational climate in the sport domain. Focusing on male high school basketball players, Seifriz, et al. found that the athletes clearly distinguished task and ego-involving climates. Specifically, characteristics of a task-involving climate include athletes perceiving that effort is rewarded, improvements noticed, every player is important to the team and mistakes are part of learning. In contrast, an ego-involving climate is evident when athletes perceive that high ability and strong performances are rewarded, rivalry among teammates is encouraged, and mistakes are punished. The researchers conducted an exploratory factor analysis, which suggested two factors were present, reflecting both a mastery (9 items) and performance (12 items) climate. Seifriz, et al. used the term "mastery climate" to indicate task-involving and "performance climate" to indicate ego-involving. Internal consistency was satisfactory (all $a > 0.80$).

In order to further validate the psychometric properties of the PMCSQ, Walling, Duda and Chi (1992) conducted a study involving young athletes in a variety of sports. Confirmatory factor analysis revealed psychometric stability for the PMCSQ, although a considerable amount of unexplained variance was found on the two-factor model suggesting that a revised version of the instrument could be beneficial.

Based on Walling, et al.'s findings, Newton, Duda and Yin (2000) developed the Perceived Motivational Climate in Sport Questionnaire- 2 (PMCSQ-2). The authors generated a large pool of items to test the underlying dimensions of motivational climates and administered the questionnaire to both female basketball and volleyball players. The confirmatory factor analysis resulted in a 30-item, six factor solution including three task-involving subscales (i.e., effort/improvement, important role and cooperative learning) and three ego-involving subscales (i.e., intra-team member rivalry, unequal recognition and punishment for mistakes). Since its

creation, the PMCSQ-2 has been used extensively in physical activity settings (e.g., Balaguer, Duda & Crespo, 1999; Smith, Fry & Ethington, 2005; Reinboth & Duda, 2006; Vazou, Ntoumanis & Duda, 2006).

The original PMCSQ and PMCSQ-2 were created to measure athletes' perceptions of their team environment (Newton, Duda & Yin, 2000; Walling, Duda & Chi, 1992), although the instruments have been used more broadly in non-sport settings such as K-12 physical education classes (e.g., Gonzalez-Cutre, et al., 2009; Ntoumanis, 2002) and college physical activity classes (e.g., Ntoumanis, 2005). Many items on the measures, but not all, are relevant and appropriate for various physical activity settings. For example, exercise settings are likely to differ from sport and physical education in terms of voluntary versus involuntary participation, stated goals, and outside social influences (e.g., peers, parents) (Ntoumanis & Biddle, 1999). Although there are differences between sport and exercise, similarities exist as well. For example, in both settings similar types of activities are performed, the environment can be focused on individuals' effort and improvement verses normative comparison, and both offer comparable psychological and physiological outcomes. In addition, both sport and exercise settings can be achievement-oriented in that individuals strive for particular goals. Yet, given the similarities, research on the motivational climate is limited in the exercise domain. A potential hurdle is that a suitable instrument to measure climate in exercise settings has not yet been fully validated. Huddleston, Fry and Brown (2011) recently created such a measure by adapting and extending the PMCSQ-2 to make it applicable to a corporate fitness facility.

Huddleston's et al., (2011) created the Perceived Motivational Climate in Exercise Settings (PMCEQ) and examined the relationship between employees' perceptions of their corporate fitness center to their intrinsic motivation to exercise. In addition to changing the stem

for each of the PMCSQ-2 items, Huddleston, et al. replaced some questions to better reflect what occurs in exercise settings. For example, individuals in an exercise setting may fail to view themselves as fulfilling an important role. However, exercise climates can be structured to make every individual feel valued and welcomed in that setting. Likewise, while athletes may feel they will be punished by their coaches if they make a mistake during a game or practice, this same phenomenon is not applicable to an exercise setting. However, individuals in an exercise setting may have a heightened awareness of their actions and abilities, causing them to feel conscious or embarrassed when they fail to, for example, demonstrate ability, and lack knowledge of how to use equipment or lack confidence in their ability to choose an appropriate exercise workout. Therefore, some items were changed to better reflect individuals' exercise experiences.

Huddleston, et al. retained 23 of the original 33 PMCSQ-2 items and added 8 new items. Face validity was established by a panel of experts trained in sport and exercise psychology, resulting in a 31-item measure. A confirmatory factor analysis supported strong invariance on both scales. Using the PMCEQ, Huddleston, et al found that employees' perceptions of a task-involving climate were positively related to their interest/enjoyment, perceived competence and effort/importance regarding their exercise program. Subsequent research utilizing the PMCEQ have also established adequate reliability (i.e., task, $\propto$ = .89; ego, $\propto$ = .90) (Brown & Fry, 2009_a). However, previous studies have not had adequate sample size to make multiple group comparisons nor has predictive validity been established and therefore, more extensive exploration of the psychometric properties of the PMCEQ is warranted.

In addition to validating the criterion validity of the PMCEQ, exploring predictive validity would help establish the instrument's ability to study the psychological impact of physical activity in various motivational climates. The influence of motivational climate on

positive and negative mood states in exercise settings has received little attention in the exercise psychology literature, especially given the link between increased physical activity and enhanced positive affect (e.g., Guszkowska & Sionek, 2009; Kanning & Schlict, 2010). Both theoretical tenants of AGPT and motivational climate research suggest that perceptions of a task-involving climate should increase positive mood states. For example, task-involving climates in physical activity classes has been linked to greater enjoyment, perceived ability, and effort towards exercise (Cecchini, et al., 2001). Given that social-environmental elements are thought to influence mood states and enjoyment for exercise is positively related to positive mood enhancement (Raedeke, 2007), perceptions of the climate should be associated with self-reported mood states.

In the exercise psychology field, more research is needed on the potential benefits and associations between individuals' perceptions of the climate and their motivational responses in order to better understand how to heighten commitment to exercise. Given the potential benefits of understanding how the climate may influence individuals' motivational outcomes (Brown & Fry, 2009_a, 2009_b; Huddleston, Fry & Brown, 2011; Moore & Fry, 2009), there exists a need for instrumentation measuring exercise setting climates. Therefore, the purpose of this study was to further validate the psychometric properties of the Perceived Motivational Climate in Exercise Settings Questionnaire. Using confirmatory factor analysis through structural equation modeling, the validity of the PMCEQ was examined to verify the strength of the task- and ego-scales respectively. In addition, the associations between perceptions of the task, ego and caring climate as well as positive and negative mood states were examined. It was hypothesized that the participants' perceptions of a task-involving and caring climate and their positive mood traits would be positively associated. In addition, it was hypothesized that the participants' perceptions

of an ego-involving climate would be negatively associated with perceptions of a task-involving and caring climate and positively associated with their negative mood traits.

Method

Participants

Members of a student recreation center (SRC) on a university campus were invited to complete a survey (N= 770, 51% female; males' $\bar{x}$ age = 20.62, SD = 3.935; females $\bar{x}$ age = 20.12, SD = 2.769) regarding their perceptions of the motivational climate in their facility as well as their exercise frequency. Membership was defined as having used the SRC at least once during the academic year (visits per semester $\bar{x}$ = 38.23, SD = 36.89).

It should be noted that this study is part of a large project examining an intervention with fitness center employees to help them create a more caring and task-involving climate. Due to length, this paper presents only the psychometric qualities of the PMCEQ. (For a full description of the intervention, see Brown & Fry, 2011-Study 2 and 3).

Measures

Motivational Climate. The motivational climate was measured with the 27-item PMCEQ developed by Huddleston, et al. (2011) for use with adult exercise programs. The wording of each question was modified for this study to pertain to the SRC. In addition, the stem "At the rec" was added to the beginning of each item to remind participants to consider their participation at the SRC when completing the survey. The PMCEQ measured the extent of a task versus ego-involving climate in a given setting. The questionnaire uses a 5-point Likert response scale, with options ranging from 1 = strongly disagree to 5 = strongly agree. Items were summed and average scores on each scale were calculated. Items included in the task-involving scale include themes of cooperation, giving best effort and striving for personal improvement and

creating an environment where everyone feels valued and welcomed. Conversely, the ego-involving items include themes of unequal recognition, individuals feeling conscious or embarrassed and creating a sense of rivalry among members. Huddleston reported internal consistency for the task-involving and ego-involving subscales at .88 and .86, respectively.

Caring Climate. The Caring Climate Scale (Newton, Fry, et al., 2007) measured the extent to which participants perceived an environment to be caring; the scale was adapted for SRC members by inserting the stem, "At the rec. . . " . This 13-item scale measured the participants' perceptions of multiple caring elements, including support, concern, and acceptance. Participants responded to the items based on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly degree. Items were summed to achieve a total caring climate score. Previous research has supported the reliability and validity of the CCS (Newton, et al., 2007; Gano-Overway, et al., 2009).

Mood. Since positive and negative affect have been shown to be distinctive and independent of one another (Watson, Clark & Tellegen, 1988), several constructs were used to tap into mood. Positive mood states were measured using constructs from the Profile of Mood States (i.e., vigor, well being, calm) and the Positive and Negative Affect Schedule (PANAS; self assurance and attentiveness; Watson & Clark, 1994). Negative mood states were measured using constructs from the POMS (depression, anxiety, fearful, fatigue, hostility; Usala & Hertzog, 1989). An advantage of the instruments selected is there flexibility for the researcher to indicate time frame (Pressman & Cohen, 2005). For this study, participants were asked to consider the mood items with regard to the last two weeks. Previous studies have demonstrated trait-like stability when using instructions that span over a week (Vlachopoulos, Karageorghis & Terry, 2000; Watson et al., 1988). In addition, research in the exercise psychology field has

reported that the POMS is sensitive to detecting exercise-related mood state changes (Berger & Motl, 2000).

Although the subscale scores for each instrument are typically reported as a sum, for clarity and consistency with the other measures, the scores were reported as averages for this study. Also, while the POMS typically uses a 0-4 scale, a 1-5 scale was used for this study to keep consistent with the other measures. Acceptable reliability has been established for both the POMS (Norcross, Guadagnoli & Prochaska, 1984) and the PANAS (Crawford & Henry, 2004).

Demographics. Participants were asked to report their age and gender.

Missing Data

The data set had a moderate amount of missing at random data on a number of variables. The total percentage of missing data values was 7%. Due to the preference for including all available data in the analysis, 100 imputations were run using Amelia within the R program (R Development Core Team, 2005). All of the information within the data set were used to impute the missing data, thus improving the model's ability to calculate unbiased parameter estimates (Graham, Cumsille & Elek-Fisk, 2003).

Procedure

During the start of the spring semester, participants of the SRC were invited to participate in a study examining students' perceptions of the recreation center. Participants were recruited via an informational table in the main lobby of the SRC as well as through residence halls and selected large-classes on campus and were given a small incentive (i.e., granola bar) for their participation. The data used for this study were part of a larger intervention considering motivational climate in exercise settings and is presented in separate papers.

Data analysis proceeded in four stages to examine the validity of the PMCEQ. First,

internal consistency estimates (coefficientα; Chronbach, 1951) and descriptive statistics were calculated for all study scales using the R program. Second, the latent factor structure of the PMCEQ measurement model was established by evaluating scores from the sample using confirmatory factor analysis (CFA) through the MPlus 6.0 program (Muthén & Muthén, 2008). Content validity for the PMCEQ was established by using gender to provide two separate groups to compare. In addition, criterion validity was established through correlation analysis of the PMCEQ and Caring Climate Scale (CCS). Finally, predictive validity was established by examining students' perceptions of the motivational climate (i.e., PMCEQ and CCS) and their reported negative and positive mood states.

Analysis

Prior to the statistical analyses, the skewness and kurtosis values of all variables were examined to check any violations of multivariate normality assumptions in the sample. Results suggested that the data were normally distributed (i.e., the univariate skewness and kurtosis values are lower than 4 and 16, respectively), and therefore maximum likelihood estimation model (ML) was used (Kline, 2010). For latent variable identification, the fixed-factor method was used, pre-setting the first factor's psi to 1.0 to create a metric scale.

In order to determine model fit, researchers recommend using several fit indices to determine the adequacy of the model (Kline, 2010; Brown, 2006). Multiple goodness of fit tests were used to evaluate the models. The chi-square goodness of fit test assessed absolute fit of the model to the data (χ^2; Joreskog & Sorbom, 1996). Although the chi-square was reported, it was not used in interpretation, because the statistic tests the null hypothesis of perfect fit to the data, which is implausible and usually rejected in models with large samples (Kline, 2010). Therefore, the following measures of relative-fit indexes were used, in which at least .90 is considered an

adequate cutoff value to limit concerns of Type I error rate when observed indicators are measured at the item level: comparative fit index (CFI) and the Tucker-Lewis fit index (TLI) (Bentler & Bonett, 1980). In addition, the absolute fit indices included the root mean square error of approximation (RMSEA) and the standardized root mean residual (SRMR) were interpreted, in which .08 or less is considered a justifiable fit of the data (Little, in press).

In the measurement model, there were a total of 11 latent constructs for both male and female participants. The latent constructs were as follows: perceptions of a task-involving climate (Task), perceptions of an ego-involving climate (Ego), and caring climate (Caring); positive mood states (i.e., Calm, Vigor, Well-being [WB], Self-Assurance [SA]; Attentiveness [ATT]); and negative mood states (Depressed [Depress], Anxiety [Anx], Fearfulness [Fear].)

Parcels (i.e., averaging the sum of two or more indicators) were created to form three manifest indicators for each of the latent constructs. Parceling offers advantages over item-level modeling such as reduced risk for dual loadings of indicators, reductions in sampling error and allowing models to be just-identified (Little, in press). To create parcels for each latent construct, the item-to-construct balancing technique was utilized (Little, et al., 2002).

Results

Internal Consistency and Validity of the PMCEQ

Means, standard deviations and Cronbach's alphas of all the scales are presented in Table 1. In general, all variables showed acceptable internal consistency (i.e., Cronbach's alpha >.70), and the values are consistent with previous research (e.g., Huddleston, Fry & Brown, 2011; Newton, Fry, et al., 2007).

Confirmatory Factor Analyses for PMCEQ

In order to establish the factor structure of the PMCEQ, the first step was to determine whether the construct measured the same across males and females. Specifically, the invariance of loadings and intercepts of the manifest indicators was examined using a two-group mean and covariances structures model. The initial configural model demonstrated acceptable fit (χ^2 (880, n = 779) = 1180.874, p = <.001, RMSEA = .030, SRMR=.041, TLI = 0.975, CFI = 0.979).

Next, following standard procedures to evaluate measurement invariance, the loadings (weak invariance) and intercepts (strong invariance) were equated. Results, shown in Table 2, found no significant changes based on two criteria: 1) the RMSEA Model Test, in which the RMSEA value of the nested model is examined to determine if the value falls within the 90% confidence interval of the comparison model (Little, 1997) and 2) the CFI change, in which the nested model value should not change more than .01 compared to the comparison (Cheung & Rensvold, 2002). The tests of weak and strong invariance revealed that the constructs were measured the same in males and females. The loading, intercept, residual, and squared multiple correlation values for each indicator, along with the variance for each latent construct in the strong metric invariant model, are presented in Table 3.

The homogeneity of the variances and covariances of the latent constructs were also measured to determine whether parameter estimates were equal across groups. The test revealed no significant differences between males or females, as shown in Table 2. No significant differences were found in parameter means either, indicating that the scale for defining the constructs is not significantly different between males and females.

Relationships Between Constructs

To establish criterion validity, the PMCEQ was compared to the Caring Climate Scale (CCS) (see Tables 4 and 5 for correlational analysis between females and males, respectively). Correlational analyses revealed that the task-involving scale of the PMCEQ was positively correlated with CCS while the ego-involving scale of the PMCEQ was negatively correlated with CCS. In addition, the PMCEQ was compared with both positive and negative mood states. All of the positive mood states (i.e., Calm, Vigor, Well-Being, Self-Assuredness, Attentiveness) were positively related to the task-involving climate. All but fatigue of the negative mood states (i.e., Depressed, Anxiety, Hostility, Fearful) were positively associated to the ego-involving climate for females while only three of the negative mood states (i.e., Depressed, Anxiety, Hostility) were positively associated to an ego-involving climate for males.

Discussion

The purpose of this study was to explore the psychometric properties of the PMCEQ using the SEM framework. Males and females were considered separately so that a two-group comparison could be made. The results indicated high loadings across the parceled indicators as well as invariance between indicator loadings and intercepts, which established content validity. Results also revealed support for criterion validity by establishing a positive correlation between the task-involving and caring climate as well as a negative correlation between the ego-involving and caring climate. Finally, perceptions of a task-involving climate were positively associated with positive-mood states (i.e., calm, well-being, vigor, self assuredness, attentiveness) whereas perceptions of an ego-involving climate were positively associated with negative-mood states (i.e., depression, anxiety; fearfulness for females only), which established predictive validity for the instrument.

This study contributes to the exercise psychology field by validating an instrument that can be used to examine perceptions of the motivational climate in exercise settings. According to Nicholls' Achievement Goal Perspective Theory (1984; 1989), achievement settings can be structured to either be task or ego-involving which influence how individuals judge their ability. Though predominately studied in sport (e.g., Reinboth & Duda, 2004; Smith, Balaguer, & Duda, 2006) and educational settings (e.g., Ames, 1992; Ames & Archer, 1992), AGPT can be applied to exercise settings, which can also be achievement-focused in nature. The validation of the PMCEQ allows for the advancement of research examining how the motivational climate influences exercise-related outcomes.

Both the content and criterion validity of the PMCEQ was established through loading and intercept invariance and by comparing the PMCEQ to the Caring Climate Scale. The researchers who created the Caring Climate Scale were attempting to identify an element that, although missing from the work of Nicholls, was a necessary component to maximize individuals' experiences in achievement settings. A caring climate compliments a task-involving climate because the focus is on individuals feeling safe, invited and valued (Newton, et al., 2007). In the initial study describing the development of the CCS, the researchers found a significant moderate correlation between perceptions of the caring climate and task-involving climate (i.e., r=.56), indicating that the two scales were positively associated, yet assessing unique aspects of the environment (Newton, Fry, et al., 2007). Newton, Watson, et al (2007) compared a caring-based climate to a traditional-based climate in a summer youth sport camp serving multiethnic, under-served youth. They found that participants' perceptions of the caring climate were negatively associated with their perceptions of the ego-involving climate. The

current study revealed similar results; perceptions of the caring climate were positively associated with the task-involving climate and negatively associated with ego-involving climate.

Further, this study demonstrated that the variance/covariance and means were equal across groups, thus indicating that the PMCEQ can be used for both male and female populations. AGPT (Nicholls, 1989) suggests that when individuals, regardless of gender, perceive a task-involving climate, they will be more likely to report more optimal cognitive, affective and behavioral motivational responses. In a study to determine whether perceptions of the motivational climate and achievement goals differed among males and females in college-level activity classes, Cunningham and Xiang (2008) utilizing the PMCSQ-2 found that perceptions of the climate were invariant across males and females. However, Huddleston, et al. (2009) were not able to examine gender differences in their sample's responses to the PMCEQ due to their limited sample size. The current study supports the Cunningham and Xiang results, demonstrating that the PMCEQ can be used for both male and female populations to assess perceptions of the motivational climate in exercise settings.

Predictive validity of the PMCEQ was established by comparing the task and ego-involving scales to various positive and negative mood states, respectively. Previous research examining exercise and participants' mood states has found that exercise enhances individuals' positive affect (Guszkowska & Sionek, 2009; Kanning & Schlicht, 2010; Rokka, Mavridis, & Kouli, 2010). While these previous studies have considered participation in physical activity in relation to mood state, an interesting implication of the current study is that exercising alone may not be enough to enhance mood state; rather, mood state may be associated with perceptions of the exercise climate, with more negative emotions emerging when individuals perceive an ego-involving climate and more positive emotions emerging when individuals perceive a task-

involving climate. These results support the work of Cecchini, et al. (2001) who found that perceptions of a task-involving climate were associated with physical education students' self-reported vigor whereas perceptions of an ego-involving climate were associated with participants' self-reported post-competition stress. The link between perceptions of the climate and mood state may have implications for those promoting exercise who wish to maximize individuals' experiences. It may not be enough to simply promote physical activity to increase positive mood; rather, intentionally fostering task-involvement and deemphasizing ego-involvement may be key.

A surprising result in the current study was the overall climate scale means, which indicated that members perceived a fairly neutral task-involving and caring climate. The means from this study were different from Huddleston, et al who found both a higher task-involving and lower ego-involving climate, respectively in an exercise facility. Huddleston, et al examined adult corporate fitness members' perceptions of the climate in their fitness center and the average age of the members was 37.99 ± 9.13 years. The current study was conducted with college students at a university fitness center, and it may be that there are aspects unique to the different fitness centers. For example, it may be that young adults have a greater focus on appearance and therefore fitness professionals might have to be more intentional in promoting an emphasis on task-involvement as compared to the focus of adults at corporate fitness facilities.

Another difference between the two studies is that Huddleston, et al examined corporate fitness centers that included a small staff and the directors each had a college degree in exercise science. The fitness center in the current study was much larger in comparison with over 150 student employees, most of whom were part-time student workers who had no training in

exercise science/psychology. The difference in administration background might also explain the means across the two studies.

Compared to physical activity studies examining the motivational climate (e.g., Cunningham & Xiang, 2008; González-Cutre, et al., 2009) the means of the current study are quite low and suggest that an intentional effort must be made to create a task-involving and caring climate to influence participants' perceptions of the environment in fitness centers. These findings have implications for practice and suggest that the staff of this particular exercise facility might benefit from implementing strategies to create a more caring, task-involving climate.

Limitations/Future Directions

Several limitations to this study should be noted for future research designs. First, the data was collected at a university recreation center which provided many different services including group fitness classes, personal training appointments, intramural leagues and personal exercise equipment (e.g., free weights, nautilus machines and cardio-equipment). While the intentions of this study were to determine the appropriateness of using the PMCEQ in all exercise-related settings, future researchers might extend the current work by considering the PMCEQ with regard to the individual services offered at recreation centers. Not only could researchers consider how the motivational climate influences members' experiences through each of those services, specific strategies could be identified to determine the behaviors that staff members in specific rolls (e.g., personal fitness, group activity, etc) engage in that foster perceptions of a caring and task-involving climate.

Second, the current study did not find a significant correlation between the task-involving and ego-involving scales of the PMCEQ. The theoretical tenants of the AGPT suggests that the

task- and ego-involving climates are moderately negatively correlated (Nicholls, 1989), which has been supported in the sport and physical education research (e.g., Newton, Duda & Yin, 2000; Spittle & Byrne, 2009). Likewise, Huddleston, et al. (2010) found a moderately strong correlation (r = -.63) between the two scales in an exercise facility setting. The lack of correlation between the two scales in the current study may be reflective of the population or the neutral view of the climate as a whole by the participants. Regardless, the correlation between the two scales warrants further exploration in exercise-related settings.

Finally, future researchers can continue to contribute to the construct validity of the instrument by employing the PMCEQ in exercise-related research. For example, it will be useful to explore the extent to which the task-involving and ego-involving scales of the PMCEQ are related to theoretically associated variables, such as intrinsic motivation for exercise, commitment and enjoyment of exercise or other self-reported motivational measures.

In summary, the current health trends in the United States call for identifying ways to increase interest and commitment levels in physical activity. The exercise psychology field can be very beneficial to those seeking to reverse current health trends, but only if proper tools are in place to understand the motivational processes. Given the known benefits of creating a caring, task-involving climate on individuals' physical activity experiences (Fry & Gano-Overway, 2010; Nicholls, 1989; Newton, Fry, et al., 2007), the validated PMCEQ can help researchers better explain individuals' experiences and benefits of exercise engagement. Moreover, intentionally creating a task-involving, caring climate in exercise facilities may influence individuals' mood states and consequently foster greater interest in committing to a physically active lifestyle. This study contributes a needed measure (i.e., the PMCEQ) to motivational

climate research and encourages more exploration of individuals' experiences at fitness-related facilities.

References

Ames, C. (1992). Classrooms: Goals, structure and student motivation. *Journal of Educational Psychology, 84,* 261-271. doi:10.1037/0022-0663.84.3.261

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80*(3), 260-267. doi:10.1037/0022-0663.80.3.260

Berger, B.G. & Motl, R.W. (2000). Exercise and mood: A selective review and synthesis of research employing the Profile of Mood States. *Journal of Applied Sport Psychology, 12,* 69-92. doi:10.1080/10413200008404214

Boyce, B.A., Gano-Overway, L.A., & Campbell, A.L. (2009). Perceived motivational climate's influence on goal orientations, perceived competence, and practice strategies across the athletic season. *Journal of Applied Sport Psychology, 21,* 381-394. doi:10.1080/10413200903204887

Brown, T. A. (2006). *Confirmatory Factor Analysis for Applied Research*. New York: The Guilford Press.

Brown, T.C. & Fry, M.D. (2009a). Relationship of exercise participants' perceptions of the caring climate to their motivational responses in college aerobic classes. Manuscript submitted for publication.

Brown, T.C. & Fry, M.D. (2009b). Students' perceptions of their exercise class environment and their psychological well-being. Manuscript submitted for publication.

Cecchini, J. A., Gonzalez, C., Carmona, A. M., Arruza, J., Escarti, A., & Balague, G. (2001). The Influence of the Physical Education Teacher on Intrinsic Motivation, Self-

Confidence, Anxiety, and Pre- and Post-Competition Mood States. *European Journal of Sport Science, 1*(4), 1. doi:10.1080/17461390100071407

Centers for Disease Control and Prevention. (2008). U.S. physical activity statistics. Retrieved April 22, 2009 from http://www.cdc.gov/nccdphp/dnpa/physical/stats/leisure_time.htm

Colagiuri, R., Colagiuri, S., Yach, D., & Pramming, S. (2006). The answer to diabetes prevention: Science, surgery, service delivery, or social policy? *American Journal of Public Health, 96*(9), 1562-1569.

Craig, C.I., Russell, S.J., Cameron, C., & Beaulieu, A. (1999). *Foundation for joint action: Reducing physical inactivity*. Ottawa, ON: Canadian Fitness and Lifestyle Research Institute.

Crawford, J.R., & Henry, J.D. (2004). The Positive and Negative Affect Schedule (PANSA): Construct validity, measurement properties and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 43,* 245-265. doi:10.1348/0144665031752934

Cunnigham, G.B. & Xiang, P. (2008). Testing the mediating role of perceived motivational climate in the relationship between achievement goals and satisfaction: Are these relationships invariant across sex? *Journal of Teaching in Physical Education, 27*(2), 192-204.

Duda, J. L. (1993). Goals: A social-cognitive approach to the study of achievement motivation in sport. In R. N. Singer, M. Murphey & L. K. Tennant (Eds.), *Handbook of Research on Sport Psychology* (pp. 421-436). New York: Macmillan.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95*, 256-273. doi:10.1348/0144665031752934

Fry, M. D., & Gano-Overway, L. (2010). Exploring the contributions of the caring climate to the youth sport experience. *Journal of Applied Sport Psychology, 22*(3), 294-300. doi: 210.1080/10413201003776352

Godin, G., & Shepard, R. J. (1997). Godin Leisure-Time Exercise Questionnaire. *Medicine & Science in Sports & Exercise, 29*(June Supplement), S36-S38.

Gonzalez-Cutre, D., Scicilia, A., Moreno, J. A., & Fernandez-Balboa, J. M. (2009). Dispositional flow in physical education: Relationships with motivational climate, social goals and perceived competence. *Journal of Teaching in Physical Education, 28*, 422-440.

Guszkowska, M., & Sionek, S. (2009). Changes in mood states and selected personality traits in women participating in a 12-week exercise program. *Human Movement, 10*(2), 163-169. doi:10.2478/v10038-009-0014-2

Huddleston, H., Fry, M.D. & Brown, T.C. (2011). *The relationship between perceived motivational climate and intrinsic motivation in corporate wellness environments*. Manuscript submitted for publication.

Kanning, M., & Schlicht, W. (2010). Be active and become happy: An ecological momentary assessment of physical activity and mood. *Journal of Sport & Exercise Psychology, 32*(2), 253-261.

Kline, R. B. (2010). *Principles and practice of structural equation modeling (3rd Ed.)*. New York: Guilford.

Magyar, T. M., Guivernau, M. R., Gano-Overway, L. A., Newton, M., Mi-Sook, K., Watson, D. L., et al. (2007). The influence of leader efficacy and emotional intelligence

on personal caring in physical activity. *Journal of Teaching in Physical Education, 26,* 310-319.

Newman, S., Steed, L., & Mulligan, K. (2006). Social cognitive predictors of sun protection intention and behavior. *Behavioral Medicine, 32*(2), 57-63. doi:10.3200/BMED.32.2.57-63

Newton, M., Duda, J. L., & Yin, Z. (2000). Examination of the psychometric properties of the Perceived Motivational Climate in Sport Questionnaire-2 in a sample of female athletes. *Journal of Sports Sciences, 18,* 275-290. doi:10.1080/026404100365018

Nicholls, J.G. (1989). *The competitive ethos and democratic education.* Cambridge, MA: Harvard University Press.

Norcross, J.C., Guadagnoli, E., & Prochaska, J.O. (1984). Factor structure of the profile of mood states (POMS): Two partial replications. *Journal of Clinical Psychology, 40,* 1270-1277. doi:10.1002/1097-4679(198409)40:5<1270::AID-JCLP2270400526>3.0.CO;2-7

Ntoumanis, N. (2002). Motivational clusters in a sample of British physical education classes. *Psychology of Sport and Exercise, 3,* 177-194. doi:10.1016/S1469-0292(01)00020-6

Ntoumanis, N. (2005). A prospective study of participation in optional school physical education using a self-determination theory framework. *Journal of Educational Psychology, 97*(3), 444-453. doi:10.1037/0022-0663.97.3.444

Ntoumanis, N., & Biddle, S. J. H. (1999). A review of motivational climate in physical activity. *Journal of Sport Sciences, 17,* 643-665. doi:10.1080/026404199365678

Papaioannou, A., G, Kosmidou, E., Tsigilis, N., & Milosis, D. (2007). Measuring perceived motivational climate in physical education. In J. Liukkonen, Y. V. Auweele, B.

Vereijken, D. Alfermann & Y. Theodorakis (Eds.), *Psychology for Physical Educators* (pp. 35-56). Champaign, IL: Human Kinetics.

Pressman, S. D., & Cohen, S. (2005). Does positive affect influence health? *Psychological Bulletin, 131*(6), 925-971. doi:10.1037/0033-2909.131.6.925

Raedeke, T.D. (2007). The relationship between enjoyment and affective responses to exercise. *Journal of Applied Sport Psychology, 19,* 105-115. doi:10.1080/10413200601113638

Reinboth, M., & Duda, J. L. (2006). Perceived motivational climate, need satisfaction and indices of well-being in team sports: A longitudinal perspective. *Psychology of Sport and Exercise, 7*, 269-286. doi:10.1016/j.psychsport.2005.06.002

Roberts, G. C. (ed.). (1992). *Motivation in Sport and Exercise*. Champaign, IL: Human Kinetics.

Roberts, G. C. (2001). Understanding the dynamics of motivation in physical activity: The influence of achievement goals on motivational processes. In G. C. Roberts (Ed.), *Advances in Motivation in Sport and Exercise*. Champaign, IL: Human Kintetics.

Rokka, S., Mavridis, G., & Kouli, O. (2010). The impact of exercise intensity on mood state of participants in dance aerobics programs. St*udies in Physical Culture & Tourism, 17*(3), 241-245.

Schoenborn C.A., Adams, P.F., Barnes, P.M., Vickerie, J.L. & Schiller, J.S. (2004). Health behaviors of adults: United States, 1999-2001. National Center for Health Statistics. Vital Health Stat, 10 (219).

Seifriz, J. J., Duda, J. L., & Chi, L. (1992). The relationship of perceived motivational climate to intrinsic motivation and beliefs about success in basketball. *Journal of Sport and Exercise Psychology, 14*, 375-391.

Smith, A. L., Balaguer, I., & Duda, J. L. (2006). Goal orientation profile differences on perceived motivational climate, perceived peer relationships, and motivation-related responses of youth athletes. *Journal of Sports Sciences, 24*(12), 1315-1327. doi:10.1080/02640410500520427

Smith, S. L., Fry, M. D., Ethington, C. A., & Li, Y. (2005). The effect of female athletes' perceptions of their coaches' behaviors on their perceptions of the motivational climate. *Journal of Applied Sport Psychology, 17*, 170-177. doi:10.1080/10413200590932470

Spittle, M., & Byrne, K. (2009). The influence of sport education on student motivation in physical education. *Physical Education and Sport Pedagogy, 14*(3), 253-266. doi:10.1080/17408980801995239

State of Aging and Health of America 2007 Report. (2007). Retrieved April 22, 2009 from http://www.cdc.gov.

Usala, P., & Hertzog, C. (1989). Measurement of affective states in adults: Evaluation of an adjective rating scale instrument. *Research on Aging, 11*(4), 403-426. doi:10.1177/0164027589114001

Vazou, S., Ntoumanis, N., & Duda, J. L. (2006). Predicting young athletes' motivational indices as a function of their perceptions of the coach- and peer-created climate. *Psychology of Sport and Exercise, 7*, 215-233. doi:10.1016/j.psychsport.2005.08.007

Walling, M. D., Duda, J. L., & Chi, L. (1992). The Perceived Motivational Climate in Sport Questionnaire: Construct and predictive validity. *Journal of Sport and Exercise Psychology, 15*, 172-183.

Watson, D., Clark, L.A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality Social Psychology, 54,* 1063-1070. doi:10.1037/0022-3514.54.6.1063

Table 1

Descriptive Statistics and Internal Consistency of Each Measure

	Females			Males		
Measure	*M*	*SD*	α	*M*	*SD*	α
Task	3.32	.64	.91	3.20	.61	.91
Ego	2.91	.59	.90	3.05	.63	.90
Caring	3.92	.62	.94	3.89	.64	.93
Calm	3.33	.83	.76	3.64	.86	.79
Vigor	3.46	.87	.82	3.45	.84	.76
Well-Being	3.81	.75	.77	3.80	.75	.74
Self-Assurance	3.32	.81	.85	3.62	.75	.86
Attentiveness	3.46	.73	.75	3.58	.77	.80
Depressed	1.68	.77	.82	1.68	.83	.82
Anxiety	2.06	.98	.72	2.06	.88	.74
Fearful	1.48	.70	.81	1.46	.66	.77

Table 2

Fit Indices for the Pre-Post Confirmatory Factor Analysis

	χ^2	df	*p*	$\Delta\chi^2$	df	*p*	RMSEA	RMSEA 90% CI	SRMR	CFI	NNFI (TLI)	Tenable?
Configural Invariance	1180.874	880	.000				.030	.025-.034	.041	.979	.975	
Weak Invariance	1181.732	902	.000				.028	.024-.033	.041	.981	.977	Yes
Strong Invariance	1183.225	924	.000				.027	.022-.031	.041	.982	.979	Yes
Variance/ Covariance	1185.454	968	.000	3.722	66	1.00	.024	.019-.029	.042	.985	.984	Yes
Means	1184.529	935	.000	1.304	11	.999	.026	.021-.031	.042	.983	.980	Yes

Table 3

Loading and Intercept Values, Residuals and R^2 Values for Each Indicator, and the Estimated Latent Variance from the Strong Metric Invariance Model

	Equated Estimates		Standardized	Females		Males	
Indicator	*Loading (SE)*	*Intercept (SE)*	*Loading*[a]	*Theta*	R^2	*Theta*	R^2
Task-Involving (Task):	Estimated Latent Variance (Females = 1.00; Males = 1.06)						
Task1	.55(.02)	3.30(.03)	.70(.03)	.09	.77	.09	.78
Task2	.55(.02)	3.37(.03)	.88(.02)	.08	.78	.08	.81
Task3	.55(.02)	3.28(.03)	.88(.02)	.12	.71	.13	.71
Ego-Involving (Ego):	Estimated Latent Variance (Females = 1.00; Males = 1.07)						
Ego1	.54(.03)	2.82(.03)	.94(.01)	.30	.49	.30	.51
Ego2	.61(.03)	2.97(.03)	.94(.01)	.11	.78	.10	.79
Ego3	.61(.03)	2.99(.03)	.93(.01)	.11	.77	.11	.78
Caring (Care):	Estimated Latent Variance (Females =1 .00; Males = 1.00)						
Care1	.60(.02)	3.86(.03)	.88(.02)	.05	.89	.05	.89
Care2	.63(.02)	3.93(.03)	.89(.01)	.05	.88	.05	.89
Care3	.64(.02)	3.89(.03)	.85(.02)	.06	.87	.06	.82
Calmness (Calm):	Estimated Latent Variance (Females =1 .00; Males = .99)						
Calm1	.76(.04)	3.56(.05)	.75(.03)	.45	.55	.44	.56
Calm2	.67(.04)	3.38(.05)	.89(.03)	.61	.43	.57	.43
Calm3	.77(.04)	3.38(.05)	.761.03)	.44	.59	.42	.58
Vigor (Vigor):	Estimated Latent Variance (Females =1 .00; Males = 1.04)						
Vigor1	.75 (.04)	3.55(.05)	.77(.02)	.39	.50	.41	.59
Vigor2	.77 (.04)	4.02(.04)	.70(.03)	.61	.59	.51	.49

1	Vigor3	.72 (.04)	3.57(.04)	.76(.02)	.39	.48	.43	.57
2	Well-Being (WB): Estimated Latent Variance (Females =1 .00; Males = 1.01)							
3	WB1	.54 (.03)	4.02(.04)	.68(.03)	.38	.48	.54	.46
4	WB2	.66 (.04)	3.61(.02)	.70(.03)	.45	.49	.51	.49
5	WB3	.70 (.04)	3.61(.05)	.71(.03)	.49	.51	.50	.50
6	Depressed (Depress): Estimated Latent Variance (Females =1 .00; Males = .94)							
7	Depress1	.66 (.04)	1.65(.04)	.74(.02)	.36	.53	.45	.55
8	Depress2	.84 (.04)	1.68(.05)	.84(.02)	.30	.70	.30	.70
9	Depress3	.71 (.04)	1.83(.04)	.77(.02)	.34	.57	.41	.59
10	Anxiety (Anx): Estimated Latent Variance (Females =1 .00; Males = .99)							
11	Anx1	.77 (.05)	2.09(.05)	.70(.03)	.62	.48	.51	.49
12	Anx2	.70 (.04)	2.12(.05)	.64(.03)	.69	.41	.59	.41
13	Anx3	.80 (.04)	2.06(.05)	.71(.03)	.63	.51	.50	.50
14	Fear (Fear): Estimated Latent Variance (Females =1 .00; Males = .94)							
15	Fear1	.66 (.03)	1.408(.04)	.828(.02)	.20	.70	.31	.69
16	Fear2	.64 (.03)	1.449(.04)	.826(.02)	.19	.68	.32	.42
17	Fear3	.66 (.04)	1.718(.04)	.685(.03)	.49	.46	.53	.53
18	Self-Assuredness (SA): Estimated Latent Variance (Females =1 .00; Males = 1.03)							
19	SA1	.77 (.03)	3.52(.04)	.88(.01)	.18	.78	.23	.77
20	SA2	.74 (.03)	3.32(.04)	.82(.02)	.27	.67	.33	.67
21	SA3	.73 (.03)	3.46(.04)	.87(.02)	.17	.76	.24	.76
22	Attentative (Att): Estimated Latent Variance (Females =1 .00; Males = .98)							
23	Att1	.70 (.03)	3.64(.04)	.88(.02)	.14	.77	.22	.78

1	Att2	.70(.04)	3.51(.04)	.738(.02)	.41	.54	.46	.54
2	Att3	.54 (.04)	3.19(.04)	.560(.03)	.77	.873	.69	.31
3								
4								

Table 4

Pearson Product Correlations Between Constructs; Females Upper Triangle; Males Lower Triangle

Measure	1	2	3	4	5	6	7	8	9	10	11
1. Task	1.00	.02	.52*	.34*	.26*	.31*	.31*	.29*	-.10	-.14	-.06
2. Ego	.02	1.00	-.16*	.01	-.03	-.02	.07	-.05	.18*	.21*	.11
3. Caring	.50*	-.16*	1.00	.21*	.21*	.23*	.15*	.17*	-.10	-.13	-.07
4. Calm	.33*	.01	.21*	1.00	.65*	.77*	.52*	.47*	-.41*	-.43*	-.21*
5. Vigor	.24*	-.03	.12	.64*	1.00	.95*	.67*	.63*	-.43*	-.26*	-.21*
6. WB	.29*	-.02	.23*	.76*	.92*	1.00	.73*	.67*	-.56*	-.42*	-.27*
7. SA	.30*	.07	.15*	.52*	.65*	.79*	1.00	.79*	-.31*	.17*	-.18*
8. ATT	.28*	-.05	.17*	.47*	.62*	.67*	.79*	1.00	-.31*	-.18*	-.14
9. Depress	-.10	.18*	-.10	-.42*	-.43*	-.42*	-.32*	-.32*	1.00	.76*	.65*
10. Anxiety	-.14	.21*	-.13	-.43*	-.26*	-.42*	.17*	-.18*	.78*	1.00	.73*
11. Fear	-.06	.11	-.07	-.22*	-.21*	-.28*	-.15*	-.14	.69*	.76*	1.00

Figure 1: Correlational Model for the Female group. Task = task-involving climate; Ego = ego-involving climate; care = caring climate; WB = well-being mood state; Anx = anxiety mood state; Fear = fearful mood state; SA = self-assuredness mood state; Att = attentativeness mood state.

Note. Only significant correlations between mood and climate are depicted. See Table 4 for the full Pearson product correlational analysis.

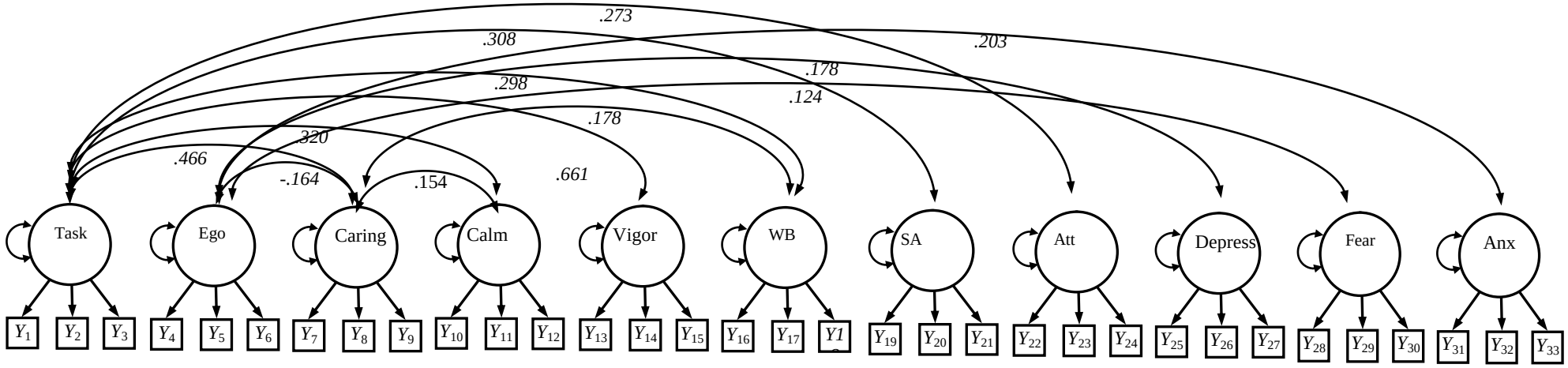
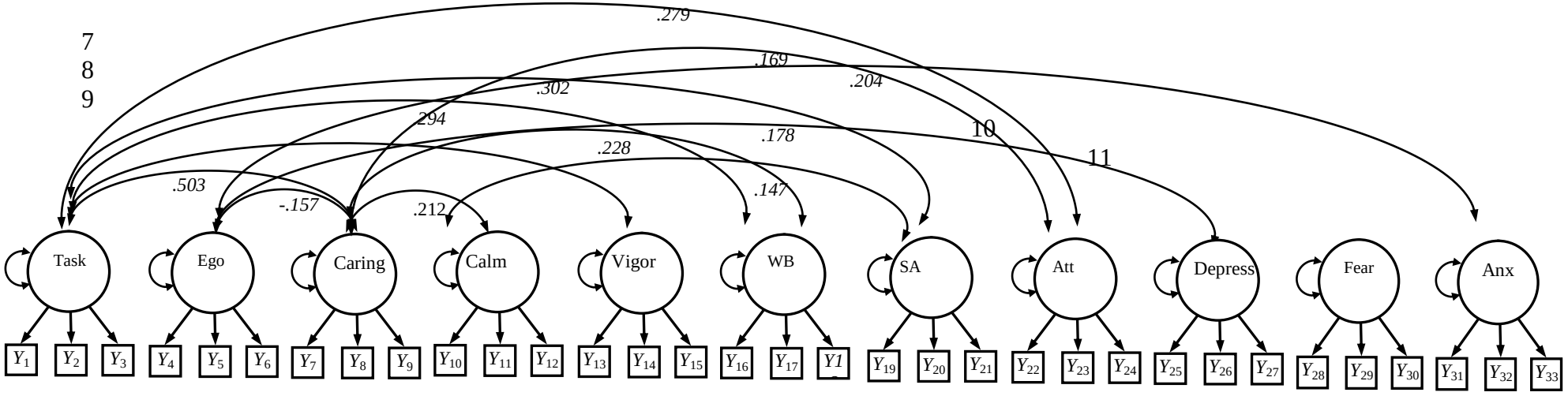


Figure 2: Correlational Model for the Male group. Task = task-involving climate; Ego = ego-involving climate; care = caring climate; WB = well-being mood state; Anx = anxiety mood state; Fear = fearful mood state; SA = self-assuredness mood state; Att = attentativeness mood state.

Note. Only significant correlations between mood and climate are depicted. See Table 4 for the Pearson product correlational analysis for males only.



Integrating Achievement Goal Perspective Theory and Self-Determination Theory in an Intervention with a University Recreation Center

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Abstract

Specific links between social contexts, physical activity motivation and psychological outcomes have received minimal attention in the exercise domain, yet might help explain individuals' decisions whether to engage in exercise. Two theoretical frameworks that have received considerable attention in the exercise psychology domain to further an understanding of exercise behavior are Achievement Goal Perspective Theory (AGPT; Nicholls, 1984; 1989) and Self-Determination Theory (SDT; Deci & Ryan, 1985, 1991); however little research has combined the theoretical tenants of each to explore how they influence each other. Therefore, the purpose of this study was to combine AGPT and SDT by examining participants' experiences while exercising at a campus recreation center both before and after an intervention with the recreation center staff (i.e., the intervention was designed to influence participants' perceptions of the climate). Using Structural Equation Modeling, a change model was created to examine the cross-lagged paths between Time 1 and Time 2 indicators on the following: climate (i.e., task-involving, ego-involving, caring); basic psychological needs (i.e., autonomy, competence, relatedness); motivation to exercise (i.e., extrinsic, intrinsic); and psychological well-being (i.e., life satisfaction, commitment to exercise, body image). Results revealed support for the model, with the change in climate predicting the basic psychological needs, the change in basic psychological needs predicting self-determined motivation and finally the change in self-determined motivation predicting the well-being measures. The final structural model demonstrated a tenable fit (χ^2 (1928, n = 779) =6205.722, p <.001, RMSEA = .053, SRMR = .061, TLI = 0.876, CFI = 0.888). Results suggest that theoretical tenants of AGPT might be an antecedent to SDT and provide insight into the mechanisms by which well-being is influenced by exercise climates.

Integrating Achievement Goal Perspective Theory and Self-Determination Theory in an Intervention with a University Recreation Center

Extensive research has confirmed a connection between regular physical activity and improved quality of life indicators such as decreased risk of certain chronic diseases (Penedo & Dahn, 2005). In addition, regular exercise has been linked to psychological well-being, including body image issues (Herrera, Johnston & Steele, 2004) as well as reduced symptoms of depression, anxiety, and stress (Babyak, et al., 2000; Hassmen, Koivula & Uutela, 2000). Yet, despite the known benefits of physical activity, nearly one third of all Americans report sedentary behaviors (National Center for Health Statistics [NCHS], 2006), which in turn increases their risk of obesity and onset of chronic diseases (Salmon, Bauman, Crawford, Timperio & Owen, 2000). Given that individuals choose whether to engage in physical activity or sedentary behaviors, research considering the motivational processes that underlie choices is critical for understanding how to maximize individuals' participation and investment in physical activity. The purpose of this study, therefore, was to examine potential mechanisms which may influence individuals' decisions to engage in exercise.

Two theoretical frameworks that have received considerable attention in the exercise psychology domain to further an understanding of exercise behavior are Achievement Goal Perspective Theory (AGPT; Nicholls, 1984; 1989) and Self-Determination Theory (SDT; Deci & Ryan, 1985, 1991). AGPT is a social-cognitive framework that focuses on individuals' conceptions of ability as influencing their cognitive, affective and behavioral responses in achievement settings. A major component of AGPT involves the motivational climate perceived by individuals in health and physical activity settings. SDT is a needs-based framework indicating that individuals' decision to engage in a particular activity is influenced by the degree

to which their motivation is self-determined. Self-determined motivation is predicted to lead to more adaptive behaviors and positive motivational outcomes (Ryan & Deci, 2000). Limited research has examined how the motivational climate can hinder or foster more self-determined exercise motivation. Research employing AGPT and SDT together may provide insight on how to enhance the success of exercise interventions.

Motivational Climate

According to Nicholls (1984; 1989), achievement settings such as exercise can be viewed as either task- or ego-involving. In task-involving climates, the emphasis is on individuals' effort and improvement. Cooperation among participants is fostered and an attempt is made to help every individual feel that he/she plays an important role in the group. In task-involving exercise settings, leaders push individuals to pursue challenging tasks, exert high personal effort and set self-improvement goals (Huddleston, Fry, & Brown, 2011).

In contrast, ego-involving climates foster competition among participants, normative comparison to others and punishment for mistakes. In ego-involving climates, positive behavioral outcomes can only be achieved when individuals perceive they have outperformed those around them (Huddleston, Fry & Brown, 2011). Furthermore, ego-involving exercise climates that emphasize extrinsic goal framing (e.g., better physique, weight loss, attractiveness, etc) distract participants' attention away from the exercise itself, instead focusing their attention on comparing themselves to and outperforming others (Vansteenkiste, Matos, Lens & Soenens, 2007).

In relation to a task-involving climate, AGPT researchers have considered another aspect of physical activity environments that is not specifically addressed in Nicholls' work; the extent to which individuals perceive a caring climate. A caring climate is one where a safe and

supportive environment fosters a sense of belonging and students feel their teachers have a genuine concern for their well-being (Magyar et al., 2007). Research in the physical domain has stemmed from Noddings' (1984, 1992, 1995) philosophical writings which argue that caring should be a major aim of education. Battastich and colleagues (1997) applied Noddings' work to research examining caring communities within schools. Newton, Watson, et al (2007) extended the work of caring within schools to youth sport settings. Specifically, they compared a caring-based climate to a traditional-based climate in a summer camp serving multiethnic, under-served youth. They found that those in the caring program had higher empathetic concern for other campers, expressed greater desire for future participation and reported lower perceptions of an ego-involving climate.

Few studies have measured both the caring and task-involving climate together in exercise settings, but those that have found promising results. For example, in college-level activity classes, students who perceived a high caring and task-involving climate were more likely to report higher hope, happiness and physical self-concept (Brown & Fry, 2009a). In a follow-up study, the researchers found college students' perceptions of a high task, high caring and low ego-involving aerobic class environment was associated with higher intrinsic motivation and commitment to physical activity, as well as more intrinsically motivating reasons for participating in exercise (i.e., health, fitness, enjoyment) as opposed to extrinsic goals (i.e., attractiveness, body tone, weight management) (Brown & Fry, 2009b). These studies suggest a link exists between individuals' perceptions of the climate and their psychological well-being although more research is needed.

Self-Determined Motivation

According to SDT, motivation to participate in a given activity lays on a continuum with amotivation on one end of the spectrum and intrinsic motivation on the other (Deci & Ryan, 1985). The type of motivation in between the two ends move from being more controlled to being more autonomous. To be controlled implies a need to act from pressure or demand, so the more controlled forms of motivation (i.e., external and introjected) are influenced by an outside pressure or desire, such as from feelings of guilt or the desire to obtain a prize. The most autonomous form of motivation (i.e., intrinsic) suggests that the given activity is performed for the inherent joy and satisfaction, and not for any separable consequences associated with the behavior (Ryan & Deci, 2000).

More self-determined reasons for exercise have been linked to measures of psychological well-being. For example, self-determined motivation has been associated with enhanced physical self-worth in exercise settings (Thogersen-Ntoumani & Ntoumanis, 2007). Likewise, research has linked more self-determined reasons for exercise with more positive affect, increased physical activity and higher physical self-worth (Vlachopoulos, Karageorghis & Terry, 2000; Wilson & Rodgers, 2002). Less self-determined motivation for physical activity has been shown to predict unhappiness and negative affect (Standage, Duda & Ntoumanis, 2005). In addition, more controlling reasons for exercise have been associated with lower self-esteem (Kernis, Paradise, Whitaker, Wheatman & Goldman, 2000).

The type of motivation individuals' possess is determined by the degree to which their need for competence, autonomy and relatedness are satisfied in their particular contexts (Deci & Ryan, 2002). Deci & Ryan (2002) argue that when basic psychological needs are authentically satisfied within social contexts, well-being is positively impacted. In contrast, ill-being results when those needs are not met. More specifically, individuals feel competent when they believe

they can achieve their intended outcomes. Autonomy is met when individuals believe they are the originator and in control of their decisions. Finally, relatedness indicates individuals feel a personal connection with individuals within their social milieu (Deci & Ryan, 2002). According to Deci and Ryan, all three psychological needs are fundamental to psychological well-being.

When structured appropriately, social contexts have the potential to satisfy the psychological needs which in turn strengthen individuals' commitment to the activity as well as their psychological well-being (Ryan & Deci, 2000; Sheldon, Elliot, Kim & Kaser, 2001). Studies that have applied SDT to the exercise domain have supported a motivational continuum for exercise behaviors (e.g., Mullen, Markland & Ingledew, 1997; Wilson, Rodgers, Blancard & Gessell, 2003; Wilson, Rodgers & Fraser, 2002). However, the specific links between social contexts, physical activity motivation and behavioral outcomes have received minimal attention in the exercise domain (Vallerand, 2001).

Integrating AGPT and SDT

Both AGPT and SDT offer insight into explaining individuals' exercise behaviors and subsequent outcomes. Researchers have advocated for more empirical research to advance an understanding of how AGPT and SDT together predict individuals' exercise experiences (Biddle, Soos & Chatzirantis, 1999). However, to date few studies have integrated both theories, although the few that have bridged concepts have found promising results. For example, Standage, Duda and Ntoumanis (2003) found that perceptions of a task-involving climate (termed mastery) influenced individuals' perceptions of autonomy, competence and relatedness in physical education classes. Likewise, Quested and Duda (2009) found that perceptions of a task-involving climate were positively associated with satisfaction of the basic psychological needs among hip hop dancers, and that satisfaction of the need for competence mediated the

relationship between climate and positive and negative affective states. In addition, perceptions of task-involving climates have been associated with intrinsic motivation in physical activity settings (Kavussanu & Roberts, 1996; Newton & Duda, 1999; Vallerand & Losier, 1999) whereas perceptions of an ego-involving climate have been associated with less self-determined motivation (Parish & Treasure, 2003).

Physical educators and exercise leaders can intentionally create classes that emphasize task-involving characteristics of the climate (Digelidis, Papaionnou, Laparidis & Christodoulidis, 2003) that specifically target individuals' basic psychological needs (Edmunds, Ntoumanis & Duda, 2008). This is of benefit to individuals as perceptions of task-involving climates in both the sport and physical education domains have been shown to support feelings of competence (Ferrer-Caja & Weiss, 2000; Kavussanu & Roberts, 1996; Reinboth, Duda & Ntoumanis, 2004), autonomy (Ferrer-Caja & Weiss, 2000; Standage, et al., 2003) and to a lesser-extent, relatedness (Sarrazin, et al., 2002).

Proposed Mediating Model of Motivational Outcomes

Vallerand's (1997, 2001) proposed hierarchical model of motivation may offer insight into the integration of SDT and AGPT. The proposed model suggests that social factors (i.e., origin climate, task-involving climate and ego-involving climate) lead to the fulfillment of psychological mediators (i.e., perceptions of autonomy, competence and relatedness). If the psychological mediators are satisfied, the degree of self-determined motivation is met, consequently influencing affective, behavioral and cognitive consequences (see Vallerand & Losier, 1999 for a copy of the proposed sequential pattern of relationships). Deci and Ryan (1991; Ryan & Deci, 2000) have also suggested similar associations among the constructs.

Minimal research attention has been devoted to examining the mediator model (Kowal & Fortier; Ntoumanis, 2001; Standage, Duda & Ntoumanis, 2003, 2005), but the research that does exist has found that fulfillment of psychological needs plays a role in motives regulating exercise behavior (Wilson & Rogers, 2008). More self-determined motivation promotes both psychological well-being (Edmunds, Ntoumanis & Duda, 2007; Wilson & Rodgers, 2002) and enduring patterns of behavior in the sport and exercise fields (Mullan & Markland, 1997; Pelletier, Fortier, Vallerand & Briere, 2001). As such, interventions targeting the motivational climate should consider the mediating effects of psychological need fulfillment and the potential outcomes on overall motivational and psychological outcomes.

Therefore, the purpose of this study was twofold: (a) to determine the effectiveness of an intervention to influence students' perceptions of the overall climate at their exercise facility; (b) to determine the mediating effect of the basic psychological needs by exploring the interrelationships between theoretical tenants of Achievement Goal Perspective Theory and Self-Determination Theory. Based on theoretical explanations (Deci & Ryan, 1985; Nicholls, 1984; Vallerand, 1997, 2001) and empirical evidence (Cox & Williams, 2008; Standage, Duda & Ntoumanis, 2003; Wilson & Rodgers, 2002), it was hypothesized that, (a) perceptions of the climate at Time 1 would predict scores on the basic psychological needs (i.e., autonomy, competence, relatedness) at Time 2, (b) basic psychological needs at Time 1 would predict level of self-determined motivation (i.e., extrinsic, intrinsic) at Time 2, and (c) self-determined motivation at Time 1 would predict commitment to exercise, satisfaction with life and body image at Time 2.

Method

Participants

Current student members (*N* = 779; $\bar{x}$ = 20.33 years, sd=3.307; n= 390 females & 300 males, 89 unknown) of a university student recreation center were invited to complete a survey prior to an intervention with the staff (i.e., the intervention consisted of training sessions on how to create a positive, caring, task-involving climate and was tailored to the individual staffs found at the recreation center). Following the intervention, the same students were contacted to complete the post survey. The survey contained the same measurements pre and post. Of those contacted, 282 completed the post survey, which was a 36% completion rate.

The intervention was delivered to the student recreation center staff (*N* = 150) and included information about the research in exercise psychology on creating a caring and task-involving climate, as well as many strategies they could use to create such an environment. Specific strategies for enhancing members' perceptions of their autonomy, competence and relatedness in relation to their exercise experiences were emphasized. Staff included anyone who might have contact with members of the recreation center such as front desk workers, group fitness instructors, personal trainers, floor supervisors, office staff, upper management and janitorial services. Separate sessions (*n* = 12) lasting approximately 75 minutes each were delivered to the individual staffs, allowing the examples offered to be tailored to the specific staff duties.

Procedures

Utilizing both a written and on-line format, pre surveys were collected for several weeks prior to the intervention. The training sessions took place over the course of one month and post surveys were collected a minimum of 6-weeks following the last training session for a total of four weeks. The results presented in this paper are part of a larger project. (For a full description of the intervention, see Brown & Fry, 2011-Study 3).

Participants were recruited at the entrance of the student recreation center as well as key areas across campus (i.e., the student union, residence halls and two large classes on the campus). Only those who were considered "regular users" (i.e. have been to the student recreation center at least five times since the start of the new semester) were invited to participate. Participants were given a granola bar for completing the pre survey and a water bottle for completing the post survey.

Measures

Motivational Climate. The 27-item PMCEQ measures the extent to which individuals perceive a task or ego-involving climate in an exercise setting (Huddleston, Fry & Brown, 2011). The wording of each question was modified for this study to pertain to the SRC. The questionnaire uses a 5-point Likert response scale, with options ranging from 1 = strongly disagree to 5 = strongly agree. The task-involving scale measures the extent to which participants experience cooperation, put forth their best effort, strive for improvement, and feel valued and welcomed. The ego-involving scale measures the extent to which individuals feel conscious or embarrassed, as well as experience unequal recognition, and intra member rivalry in exercise settings. Huddleston, et al. reported internal consistency for the task-involving and ego-involving scales at .88 and .86, respectively.

Caring Climate. The Caring Climate Scale (Newton, Fry, et al., 2007) measures the participants' perceptions of multiple caring elements, including support, concern and acceptance. The stem for each item is "In the rec center. . ." and participants respond to the 13 items based on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly degree. Items are summed and averaged to achieve a total caring climate score. Previous research has supported the reliability and validity of the CCS (Newton, et al., 2007; Gano-Overway, et al., 2009).

Basic Needs Satisfaction. The Psychological Need Satisfaction in Exercise (PNSE; Wilson, Rogers, Rodgers & Wild, 2006) was used to determine the degree to which participants experienced satisfaction of the three basic needs identified in the Self Determination Theory (Deci & Ryan, 1985, 1991). The PNSE is an 18-item measure made up of three subscales (6 items each) designed to measure participants' perceptions of autonomy, competence and relatedness experienced during a typical exercise session. The questionnaire uses a 6-point Likert scale, with 1 = false to 6 = true. However, for consistency purposes with this study, the scale was modified to a 5-point Likert scale, with 1 = false and 5 = true. Wilson, et al. (2006) provided initial evidence supporting the structural and convergent validity of the PNSE among young adult exercisers. The alpha coefficients for the subscales ranged from .90 to .91. Likewise, Wilson & Rogers (2008) found alpha coefficients ranging from .91 to .93 for the PNSE subscales among a sample of undergraduate students and college staff enrolled in aerobic classes.

Behavioral Regulation in Exercise. The 15-item Behavioral Regulation in Exercise Questionnaire (BREQ, Mullan, Markland & Inglewdew, 1997) was used to assess participants' level of motivation on the self-determination continuum described by Deci and Ryan (1985, 1991). The BREQ includes the following subscales: external, introjected, identified and intrinsic forms of regulation of exercise behavior, The BREQ was designed so that a mean score could be calculated for each multidimensional scale. For the purposes of this study and in the interest of parsimony, only the extrinsic and intrinsic scores were utilized to represent opposite ends of the continuum of motivation. Although the original questionnaire uses a 0-4 Likert scale, the scale was changed to 1-5 to keep the measures consistent in this current study. This change in scale has appeared in other research utilizing the BREQ (e.g., Wilson, Rodgers & Fraser, 2002). The

questionnaire in this study uses a 5-point Likert response scale, with options ranging from 1 = not true for me to 5 = very true for me. Structural validity for the instrument has been supported (Wilson, Rodgers & Fraser, 2002) and alpha levels have ranged from .70 to .92 for the four-factor structure across research studies (Mullan & Markland, 1997; Mullan, et al., 1997; Edmunds, et al., 2006).

Commitment. Exercise commitment was measured using the Exercise Commitment Scale **(**Alexandris, Zaharidis, Tsorbatzoudis, & Grouios, 2002**)**, which was modified from Scanlan et al. (1993) original Sport Commitment Scale. The modified version was created to assess commitment to exercise-related activity in a health club setting. Alexandris et al. scale originally included enjoyment, investment, social constraints, and involvement opportunities. For the purposes of this study, only the commitment to exercise scale will be included. The Exercise Commitment Scale uses a scale ranging from 1= Not at All to 5 = Extremely. Items will be summed and averaged to achieve a total exercise commitment score. Alexandris, et al. (2002) measured internal consistency at .86 and the factor structure was supported through confirmatory factor analysis.

Satisfaction with Life. The cognitive judgment of an individual's life was measured with the Satisfaction with Life Scale (SWLS; Diener, et al., 1985). Sample items included, "I am satisfied with my life" and "If I could live my life over, I would change almost nothing." The 5-item scale utilizes a seven-point Likert scale, with options ranging from 1 = strongly disagree to 7 = strongly agree. The SWLS has been shown to have favorable psychometric properties (Pavot & Diener, 1993). For example, in a study with undergraduate students, researchers recounted a test-retest correlation coefficient of .82 and alpha coefficient of .87 (Diener, Emmons, Larsen, & Griffin, 1985).

Body Image. The Body Image States Scale (BISS; Cash, Fleming, Alindogan, Steadman & Whitehead, 2002) measures individuals' evaluation of their physical appearance at a particular moment in time and is sensitive to positive and negative situation contexts. The 6-item measure taps into the continuum of dissatisfaction to satisfaction with 1) overall physical appearance; 2) body size and shape; 3) weight; 4) physical attractiveness; 5) comparison between look and feelings; and 6) comparison between self and average people. A 9-point Likert scale is used, with half the items presented in a negative to positive direction and vice versa for the other half. The 6-items are summed and averaged; higher BISS scores on the 9-point dimension indicate more favorable body image states. To test internal reliability, researchers administer the scale in both neutral, positive and negative contexts. The alpha levels have been lower in neutral contexts, due to less variability in item 5 which involves a comparison of current feelings relative to usual feelings. In positive and negative contexts, the alpha levels have ranged from .78 TO .84. Test-retest reliability over a 2-3 week period was .69 for women and .68 for men ($p < .001$) (Cash, et al., 2002).

Demographics. Participants were asked to report their age and gender.

Missing Data

The data set had a moderate amount of missing at random data on a number of variables. The total percentage of missing data values was 35%. Due to the potential of harmful effects of not including all available data in the analysis, 100 imputations were run using Amelia within the R program (R Development Core Team, 2005). All of the information within the data set were used to impute the missing data, thus improving the model's ability to calculate unbiased parameter estimates (Graham, Cumsille & Elek-Fisk, 2003).

Analysis

Structural equation modeling (SEM) was used to examine the research questions using MPlus 6 (Muthén & Muthén, 2008). SEM allows researchers to examine relationships among multiple latent constructs measured longitudinally. An advantage of SEM is that factorial invariance can be established by comparing factor loadings and intercepts across time (Kline, 2011). To test the proposed hypotheses, the following steps are outlined: (a) a test of the measurement model that specified the relationship between indicators (e.g., observed variables) and latent constructs (e.g., unobserved variables); (b) a test of the measurement equivalence in the measurement of these models across the pre-intervention (e.g., Time 1) and post-intervention (e.g., Time 2) time points; (c) tests of the structural models that specify the casual relationships between the latent constructs from Time 1 to Time 2 (Brown, 2006; Kline, 2011; Little, 1997).

In the measurement model, there were a total of 22 latent constructs, 11 representing Time 1 and the same constructs repeated in Time 2. The latent constructs were as follows: three representing perceptions of the climates (caring, task, ego), three representing basic psychological needs (autonomy [aut], competence [com], relatedness [rel]), two representing the ends of the self-determination continuum (intrinsic [int], extrinsic [ext]) two representing well-being (satisfaction with life [life], body image [body]) and finally commitment to exercise [commit].

Parcels (i.e., averaging the sum of two or more indicators) were created to form three manifest indicators for each of the latent constructs. Parceling offers advantages over item-level modeling such as reduced risk for dual loadings of indicators, reductions in sampling error and allowing models to be just-identified (Little, in press). To create parcels for each latent construct, the item-to-construct balancing technique was utilized (Little, et al., 2002). In addition, to set the

scale, the fixed factor method was utilized, which fixes the psi on each latent construct to 1.0 (Kline, 2011).

Results

Means, standard deviations and alpha levels for each of the latent constructs are reported in Table 1. The results of the measurement models and structural models will be reported separately.

Measurement Model

The measurement model attempts to establish strong invariance (i.e., invariance of the loadings and intercepts of indicators) across the pre and post groups. A two-group mean and covariance structure model was used. First, an alternative null model was established due to the longitudinal nature of the data (χ^2 (2220, n = 779) = 47608.380, p = .001). The freely estimated configural invariance model demonstrated acceptable fit (χ^2 (1815, n = 779) = 5591.051, p = <.001, RMSEA = .052, SRMR = .040, TLI = 0.944, CFI = 0.917). Following standard procedures to evaluate measurement invariance, the loadings were equated (weak invariance) followed by the intercepts (strong invariance). Based on the model indices, only partial strong invariance was established after allowing the first and second parcel on intrinsic motivation to freely estimate.

The results, reported in Table 2, revealed no significant changes in fit based on the RMSEA Model Test (Little, 1997) and test of change in CFI (Cheung & Rensvold, 2002), thus indicating invariance of latent constructs between pre and post measurement. The loadings, intercepts, residuals and squared multiple correlation values for the indicators are reported in Table 3, along with the variance for each latent construct in the strong invariant model. Finally,

the relationships between latent means across pre and post measures were evaluated to determine if significant changes occurred. Results between latent means are reported in Table 4.

Structural Models

A ½ longitudinal mediation structural model was hypothesized, with basic psychological needs mediating the relationship between perceptions of the climate and motivation to exercise as well as the relationship with the well-being measures. However, after evaluating the equivalence of variances and covariances in the structural model, there were significant differences in the variances of the constructs between time points ($\Delta\chi2(11, n=779) = 147.888$, $p<.001$) as well as correlations ($\Delta\chi2(169, n=779) = 2560.391$, $p<.001$). Thus, the assumption of stationarity was not met (i.e., unchanging casual structure over time) and therefore, a ½ longitudinal mediation design could not be established (Cole & Maxwell, 2003; Maxwell & Cole, 2007).

Since the homogeneity of parameter tests suggested that a change had occurred between Time 1 and Time 2, a change model was created. The purpose of the change model was to test the casual nature of the relationships between Time 1 and Time 2 constructs by regressing the Time 2 indicators on the Time 1 indicators, thus controlling for the influence of Time 1.

Focusing on the overall time-lagged affects, results indicated that the change in climate (i.e., caring, task-and ego-involving) predicted the basic psychological needs as hypothesized, but not equally across constructs. Specifically, only the change in ego-involving climate negatively predicted all of the basic psychological needs (autonomy: $\beta= -1.366$, $p< .01$; competence: $\beta= -.134$, $p< .01$; relatedness: $\beta= -.128$, $p< .01$). The change in caring only predicted autonomy ($\beta= .119$, $p< .01$) while the change in task-involving climate positively predicted only competence ($\beta= .171$, $p< .01$).

Likewise, the basic psychological needs predicted motivation to exercise as hypothesized, although again not equally across each construct. Only the change in autonomy predicted intrinsic motivation ($\beta = .216$, $p < .01$) while all three needs negatively predicted extrinsic motivation.

Finally, the well-being measures (i.e., commitment to exercise, satisfaction with life and body image) were positively predicted by intrinsic and negatively predicted by extrinsic motivation, although the change in ego-involving climate on commitment to exercise was not statistically significant ($\beta = -.099$, $p < .012$). The final structural model demonstrated a tenable fit (χ^2 (1928, n = 779) =6205.722, p <.001, RMSEA = .053, SRMR = .061, TLI = 0.876, CFI = 0.888). Although TLI and CFI are considered only mediocre fit, both fit statistics tend to worsen as more variables are added to the model (Kenny & McCoach, 2003) and therefore RMSEA and SRMR may be a more reliable measure for a study of this size. The final structural model is presented in Figure 1.

Discussion

The purpose of this study was two-fold: (a) to determine the effectiveness of an intervention regarding members' perceptions of a recreation center, and (b) to explore the interrelationships between theoretical tenants of Achievement Goal Perspective Theory and Self-Determination Theory. Using an SEM framework, the questions regarding the theories and intervention were explored. The results partly supported the hypothesized relationships between AGPT and SDT; specifically, there were unidirectional, cross-lagged effects between perceptions of climate and the basic psychological needs; between the basic psychological needs and motivation to exercise; and between motivation to exercise and measures of well-being. In addition, perceptions of the task-involving and caring climate positively predicted life satisfaction and

body image. However, the mediation effects of the basic psychological needs could not be established because the correlations between Time 1 and Time 2 constructs changed over the course of time and thus violated the assumption of stationarity (Cole & Maxwell, 2003).

Summary of Findings

Invariance of the Loadings and Intercepts. First, the construct comparability of the eleven latent constructs were evaluated (i.e., caring, task, ego, autonomy, competence, relatedness, intrinsic, extrinsic, commitment to exercise, satisfaction with life and body image) between Time 1 and Time 2. Establishing factorial invariance provides a basis for future researching comparing and assessing these constructs in exercise settings. Ensuring that the loadings and intercepts of each of the latent constructs were equivalent provided a basis for comparing the construct's variance, correlations and means (Little, 1997).

Effectiveness of the Intervention. After establishing strong invariance across the two time points, the equivalence of the construct's variances, covariances and correlations were evaluated. These procedures demonstrated there were differences across the groups in the variances and correlations of the constructs as well as latent mean differences, thus suggesting the effectiveness of the intervention in changing members' perceptions of the recreation center climate. While perceptions of the caring and task-involving climate significantly increased, perceptions of the ego-involving climate decreased. Likewise, competence, relatedness, intrinsic motivation to exercise and two of the well-being measures (commitment to exercise, commitment to exercise) increased. The results are consistent with previous research that has employed interventions to elicit a change in need satisfaction and more self-determined motivation for exercise (Ryan & Deci, 2000; Wilson, et al., 2003).

Only extrinsic motivation to exercise and perceived autonomy did not significantly change between time points. Ryan and Deci (2000) explain that extrinsic motivation involves doing an activity (such as exercise) because the activity is instrumental to a separate consequence or reward, not because the activity is rewarding in it of itself. One possible explanation for the lack of change might be that those who are extrinsically motivated may be less inclined to notice a caring or task-involving climate, despite efforts of the staff to foster such a climate, because they are more focused on a separate reward. Another possible explanation may involve the population, which included all college students on a university campus. In a similar sample population, Kilpatrick, Hebert and Bartholomew (2005) found that college students were more likely to report body-related motivation for exercise (e.g., appearance, weight management) than intrinsically-oriented reasons such as enjoyment. Given college-students propensity to be appearance-driven, perhaps this study's intervention was not enough to influence a change in extrinsically-motivated goals.

As for the lack of change in autonomy, this finding may reflect the nature of a recreation center environment. Recreation centers are purposefully set-up to allow members to exercise as they wish. Members are free to choose which equipment or type of exercise they want to perform without seeking permission. The mean on autonomy on Time 1 was high (i.e., 4.40 out of 5.00) suggesting the members already felt autonomous in their exercise choices. The results of this study regarding autonomy are not inconsistent with other longitudinal designs aimed at influencing the basic psychological needs. For example, in their longitudinal study on exercise-related perceptions, Wilson, et al (2003) found a significant decrease in perceived autonomy at the end of a 12-week exercise program session while relatedness and competence increased.

Another interesting finding from the study was the decrease in body image from pre to post intervention. The pre surveys (i.e., Time 1) were completed during January and the post surveys (i.e., Time 2) were completed in the Spring. As the study participants were all college students, the timing of survey collection could have played a role in influencing their body image. Spring time can be associated with warmer weather and more revealing clothes and thus could have influenced participants' body image score. College students, in particular, have a high rate of distorted self body image and perceptions of ideal body weight (Stuhldreher & Ryan, 1999). Recent National College Health Assessment data indicate that while 69% of college females and 59% of college males are at a desirable BMI, a high number of them (i.e., 60% for females and 30% and males) intend to lose weight (American College Health Association [ACHA], 2006). Thus, despite the influences intended by the intervention, the study could have been swayed by survey timing.

Intercorrelations Between Constructs. The change model included a correlational analysis between both Time 1 constructs and Time 2 constructs and demonstrated positive relationships between perceptions of a caring, task-involving climate, basic psychological needs, intrinsic motivation for exercise and psychological well-being. Likewise, negative relationships exist between perceptions of ego-involving climates and the subsequent measures. These findings are consistent with previous research (Kowal & Fortier, 2000; Wilson, et al., 2003) and theory (Nicholls, 1989; Ryan & Deci, 2000) and imply that positive consequences are associated with individuals perceiving a caring, task-involving climate. In addition, perceptions of the climate were related to the basic psychological needs, but not equally across constructs, suggesting that each concept (i.e., task-involving, ego-involving, caring) may be important to incorporate if the basic psychological needs are to be met.

As for SDT, the basic psychological needs were moderately and positively intercorrelated, which is constant with previous research (Reinboth, Duda & Ntoumanis, 2004). Both intrinsic and extrinsic motivation were related to the measures of well-being (i.e., satisfaction with life and body image) and commitment to exercise. While intrinsic motivation was positively related to the three measures, extrinsic motivation was negatively related. These findings are consistent with SDT, which suggests that self-determined motivation should lead to enhanced wellbeing (Deci & Ryan, 2002). In addition, this study's findings are aligned with previous research demonstrating that intrinsic motivation is related to positive motivational consequences in the exercise domain (Kowal & Fortier, 2000; Li, 1999; Wilson et al., 2003). In this particular study, self-determined motivation (i.e., intrinsic motivation) was most highly positively correlated with commitment to exercise, which has important implications for fitness centers facilities interested in addressing individuals' lifelong exercise adherence. Fitness professionals who can influence members' intrinsic motivation may also have a positive effect on their wellbeing.

Change Model: Cross Lagged Paths. While the correlational analysis revealed support for the interconnectedness of the constructs, the cross-lagged path analysis suggested how the constructs predicted one another. The change model supported the theoretical hypothesis for perceptions of the climate predicting the basic psychological needs; the basic psychological needs predicting self-determined motivation; and self-determined motivation predicting measures of well-being. Although the meditational role of the basic psychological needs could not be established, the current study suggests that perceptions of the motivational climate influence members' motivation to exercise by satisfying their needs for autonomy, competence and relatedness. Previous research in exercise settings has supported the role of motivational

climate influencing the basic psychological needs (Cox & Williams, 2008; Quested & Duda, 2009).

In addition, and in line with theoretical underpinnings (Deci & Ryan, 2000), the basic psychological needs had direct affects on both intrinsic and extrinsic motivation. Interestingly, however, in the current study, only the change in autonomy positively predicted intrinsic motivation. While theoretically, autonomy plays an important role in influencing motivation to exercise, competence has been shown to have the strongest influence of the basic psychological needs on intrinsic motivation (Ntoumanis, 2001). However, all three basic psychological needs had direct effects on extrinsic motivation, which has been supported in previous research in exercise settings (Murcia, Coll & Pérez, 2009).

Both intrinsic and extrinsic motivation predicted the well-being measures, with the highest regression between intrinsic motivation and commitment to exercise. Theoretical tenants of SDT argue that motivation can potentially enhance positive consequences in exercise settings (Deci & Ryan, 2000). The results of this study suggest that by increasing intrinsic motivation, individuals' satisfaction with life, commitment to exercise and body image can all increase as well. In addition, perceptions of climate (specifically task-involving and caring climates) can have a positive effect on increasing life satisfaction and body image.

Study Limitations

Several limitations of this study should be noted. First, the data was only collected at two time points and thus, only a ½ longitudinal design could be constructed. In addition, the assumption of stationarity was violated and therefore mediation could not be tested (Cole & Maxwell, 2003). Previous studies suggesting a mediating role between basic psychological needs and self-determined motivation to exercise (e.g., Cox & Williams, 2008; Standage et al.,

2006) did not include a longitudinal design and therefore could not test for true mediation (Cole & Maxwell, 2003). Future studies should consider at least three time points for data collection so that the overall indirect effect process can be properly examined. Without the longitudinal design, the predictive nature of the constructs cannot be proved. That is, while the intervention suggests a direction for how the relationships between constructs occurred, a true longitudinal design (i.e., with at least three time points) is necessary to establish baseline and final results.

Second, the study involved an entire recreation center which included a myriad of fitness offerings, some very different in nature. For example, members participating in solitary exercises (e.g., running, bicycling) may have different perceptions of the effects of an intervention compared to those participating in group-fitness (e.g., rock climbing, aerobics). In addition, staff of the recreation center have varying degrees of interactions with the members. While some members may participate in activities that require a great deal of interaction (e.g., personal trainers), other members may prefer a more solitary workout. Therefore, the direct effects of the constructs may not have been as evident with this particular population. Future studies might target a population who interact often with recreation center staff to determine how varying levels of daily contact influence the model.

Third, this particular study targeted college students and cannot be generalized to the entire adult population. While recreation centers have similar missions and goals, the nuances of a recreation center found on a college campus may be very different from those found in the general population, given the different clientele and business model.

Implications for Future Research

The purpose of this study was to explore the effects of an intervention with recreation center staff on members' perceptions of the environment and their exercise experiences. The use

of structural equation modeling allowed for flexible examination of the interrelationships of the two theories' constructs providing direction for future research in the exercise psychology field. Perhaps most importantly, this research provides evidence for the effectiveness of an intervention to influence members' perceptions and exercise experiences at a recreation center. According to Ryan and Deci (2000), understanding how to create social environments that satisfy psychological need satisfaction and increase intrinsic motivation is essential to influencing personal development and well-being. Given that minimal time and resources were used to deliver the intervention (i.e., 1-hour training), and that members' intrinsic motivation, satisfaction with life and commitment to exercise increased as a result, recreation center personnel might consider including information on how to create a caring, task-involving climate in their staff training.

Increasing college students' interest and commitment to exercise can influence their lifelong activity levels. The findings of the current study suggest a mechanism for positively impacting college students' well-being through physical activity; specifically their satisfaction with life, body image and commitment to future exercise. By fostering a caring, task-involving climate, recreation center staff can impact members' autonomy, competence and relatedness, which influences their self-determined motivation for exercise. Combining the theoretical tenants of AGPT and SDT such as in the present work holds a particular attraction for those in the exercise psychology field interested in intervention strategies for influencing exercisers' experiences. Influencing the well-being of exercisers by reengineering the motivational climate offers a practical tool recreation center personnel can implement.

References

Alexandris, K., Zahariadis, P., Tsorbatzoudis, C., & Grouios, G. (2002). Testing the Sport Commitment Model in the Context of Exercise and Fitness Participation. *Journal of Sport Behavior, 25*(3), 217.

American College Health Association. (2006). American College Health Association – national college health assessment (ACHA-NCHA) web summary, Spring 2005 Data. Retrieved December 9, 2010, from http://www.acha.org/projects_programs/WEIGHTS05.cfm

Babyak, M. A., Blumenthal, J. A., Herman, S., Khatri, P., Doraiswarny, P. M., Moore, K. A., et al. (2000). Exercise treatment for major depression: Maintenance of therapeutic benefit at 10 months. *Psychosomatic Medicine, 62,* 633-638.PMid:11020092

Battistich, V., & Hom, A. (1997). The relationship between students' sense of their school as a community and their involvement in problem behaviors. *American Journal of Public Health, 87*(12), 1997-2001.doi:10.2105/AJPH.87.12.1997

Biddle, S., Soos, I., & Chatzirasrantis, N. (1999). Predicting physical activity intentions using goal perspectives and self-determination approaches. *European Psychologist, 4,* 83-89.

Brown, T. A. (2006). Confirmatory factor analysis for applied research. New York: Guilford.

Brown, T.C. & Fry, M.D. (2009a). Relationship of exercise participants' perceptions of the caring climate to their motivational responses in college aerobic classes. Manuscript submitted for publication.

Brown, T.C. & Fry, M.D. (2009b). Students' perceptions of their exercise class environment and their psychological well-being. Manuscript submitted for publication.

Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond Body

Image as a Trait: The Development and Validation of the Body Image States Scale. *Eating Disorders, 10*(2), 103-113. doi:10.1080/10640260290081678

Cheung, G.W., & Rensvold, R.B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233-255. doi:10.1207/S15328007SEM0902_5

Cole, D.A. & Maxwell, S.E. (2003). Testing meditational models with longitudinal data: Myths and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558-577.doi:10.1037/0021-843X.112.4.558

Cox, A., & Williams, L. (2008). The role of perceived teacher support, motivational climate, and psychological need satisfaction in students' physical education motivation. *Journal of Sport & Exercise Psychology, 30*, 222-239. PMid:18490792

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior (2nd ed). New York: Plenum Press.

Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), Nebraska Symposium on Motivation: Vol. 38. Perspectives on motivation (pp. 237-288). Lincoln: University of Nebraska Press.

Deci, E. L., & Ryan, R. M. (2002). Handbook of self-determination research. Rochester, NY: University of Rochester Press.

Diener, E., Emmons, R., Larsen, R., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49,* 71-75. doi:10.1207/s15327752jpa4901_13

Digelidis, N., Papaioannou, A., Lapardidis, K., & Christodoulidis, T. (2003). A one-year

intervention in 7th grade physical education classes aiming to change motivational climate and attitudes towards exercise. *Psychology of Sport and Exercise, 4,* 195-210. doi:10.1016/S1469-0292(02)00002-X

Edmunds, J., Ntoumanis, N., & Duda, J. L. (2006). A Test of Self-Determination Theory in the Exercise Domain. *Journal of Applied Sport Psychology, 36*(9), 2240-2265. doi:10.1111/j.0021-9029.2006.00102.x

Edmunds, J., Ntoumanis, N., & Duda, J. L. (2007). Adherence and Well-being in Overweight and Obese Patients Referred to an Exercise on Prescription Scheme: A Self-Determination Theory Perspective. *Psychology of Sport and Exercise, 8*(5), 722-740. doi:10.1016/j.psychsport.2006.07.006

Edmunds, J., Ntoumanis, N., & Duda, J. L. (2008). Testing a self-determination action theory based teaching style intervention in the exercise domain. *European Journal of Social Psychology, 38,* 375-388. doi:10.1002/ejsp.463

Ferrer-Caja, E., & Weiss, M. R. (2000). Predictors of intrinsic motivation among adolescent students in physical education. *Research Quarterly for Exercise and Sport, 71*, 267-279. PMid:10999264

Graham, J.W., Cumsille, P.E., & Elek-Fisk, E. (2003) Methods for handling missing data. In J. Schinka & W.F. Velicer (Eds.), Research methods in psychology (Vol. 2, pp. 87-114). New York: John Wiley & Sons.

Hassmen, P., Koivula, N., & Uutela, A. (2000). Physical exercise and psychological well-being: A population study in Finland. *Preventive Medicine, 30*(1), 17-25. doi:10.1006/pmed.1999.0597

Herrera, E.A., Johnston, C.A., & Steele, R.G. (2004). A comparison of cognitive and behavioral

treatments for pediatric obesity. *Children's Health Care, 33* (2), 151-167. doi:10.1207/s15326888chc3302_5

Huddleston, H., Fry, M.D. & Brown, T.C. (2011). The relationship between perceived motivational climate and intrinsic motivation in corporate wellness environments. Manuscript submitted for publication.

Kavussanu, M., & Roberts, G. C. (1996). Motivation in physical activity contexts: The relationship of perceived motivational climate to intrinsic motivation and self-efficacy. *Journal of Sport and Exercise Psychology, 18,* 264-280.

Kenny, D.A., & McCoach, D.B. (2003). Effects of the number of variables on measures of fit in structural equation modeling. *Structural Equation Modeling, 10*(3), 333-351. doi:10.1207/S15328007SEM1003_1

Kernis, M. H., Paradise, A. W., Whitaker, D. J., Wheatman, S. R., & Goldman, B. N. (2000). Master of one's psychological domain? Not likely if one's self-esteem is unstable. *Personality and Social Psychology Bulletin, 26*(10), 1297-1305. doi:10.1177/0146167200262010

Kilpatrick, M., Hebert, E., & Bartholomew, J. (2005). College students' motivation for physical activity: Differentiating men's and women's motives for sport participation and exercise. *Journal of American College Health, 54*(2), 87-94. Retrieved from EBSCOhost. doi:10.3200/JACH.54.2.87-94

Kline, R. B. (2010). Principles and practice of structural equation modeling (3rd Ed.). New York: Guilford.

Kowal, J., & Fortier, M. (2000). Testing relationships from the hierarchical model of intrinsic

and extrinsic motivation using flow as a motivational consequence. *Research Quarterly for Exercise and Sport, 71,* 171-181. PMid:10925814

Li, F. (1999). The Exercise Motivation scale: Its multifaceted structure and construct validity. *Journal of Applied Sport Psychology, 11,* 97-115. doi:10.1080/10413209908402953

Little, T.D. (1997). Mean and covariance structures (MACS) analyses of cross-cultural data: Practical and theoretical issues. *Multivariate Behavioral Research, 32*(5), 53-76. doi:10.1207/s15327906mbr3201_3

Little, T.D., Cunningham, W.A., Shahar, G., & Widaman, K.F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*(2), 151-173. doi:10.1207/S15328007SEM0902_1

Magyar, T. M., Guivernau, M. R., Gano-Overway, L. A., Newton, M., Mi-Sook, K., Watson, D. L., et al. (2007). The Influence of Leader Efficacy and Emotional Intelligence on Personal Caring in Physical Activity. *Journal of Teaching in Physical Education, 26*, 310-319.

Maxwell, S.E., & Cole, D.A. (2007). Bias in cross sectional analysis of longitudinal mediation. *Psychological Methods, 12,* 23-44. doi:10.1037/1082-989X.12.1.23

Mullan, E., & Markland, D. (1997). Variations in Self-Determination Across the Stages of Chang for Exercise in Adults. *Motivation and Emotion, 21*(4), 349-362. doi:10.1023/A:1024436423492

Mullan, E., Markland, D., & Ingledew, D. K. (1997). A graded conceptualization of self determination in the regulation of exercise behaviour: Development of a measure using confirmatory factor analytic procedures. *Personality and Individual Differences, 23*(5), 745-752. doi:10.1016/S0191-8869(97)00107-4

Murcia, J. A. M., Coll, D. G.-C., & Pérez, L. M. R. (2009). Self-determined motivation and physical education importance. *Human Movement, 10*(1), 5-11. doi:10.2478/v10038-008-0022-7

Muthén, B. and Muthén, L. (2008). Mplus User's Guide. Los Angeles, CA: Muthén & Muthén.

National Center for Health Statistics. (2006). Fast stats a to z. Retrieved February 16, 2009, from http://www.cdc.gov/nchs/fastats/exercise.htm

Newton, M., & Duda, J. L. (1999). The interaction of motivational climate, dispositional goal orientations, and perceived ability in predicting indices of motivation. *International Journal of Sport Psychology, 30,* 63-82.

Newton, M., Fry, M., Watson, D., Gano-Overway, L., Mi-Sook, K., Magyar, M., et al. (2007). Psychometric Properties of the Caring Climate Scale in a Physical Activity Setting. *Revisa de Psicologia del Deporte, 16*(1), 67-84.

Newton, M., Watson, D. L., Gano-Overway, L., Fry, M., Mi-Sook, K., & Magyar, M. (2007). The Role of a Caring-Based Intervention in a Physical Activity Setting. *The Urban Review, 39*(3), 281-299. doi:10.1007/s11256-007-0065-7

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice and performance. *Psychological Review, 91,* 328-346. doi:10.1037/0033 295X.91.3.328

Nicholls, J.G. (1989). The competitive ethos and democratic education. Cambridge, MA: Harvard University Press.

Noddings, N. (1984). Caring: A feminine approach to ethics and moral education. Berkeley: University of California Press.

Noddings, N. (1992). The challenge to care in schools: An alternative approach to education.

NY: Teachers College Press.

Noddings, N. (1995). Teaching themes of care. Phi Delta Kappan, 76, 675-679.

Ntoumanis, N. (2001). A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology*, *71*(2), 225-242. doi:10.1348/000709901158497

Parish, L. E., & Treasure, D. C. (2003). Physical activity and situational motivation in physical education: Influence of the motivational climate and perceived ability. *Research Quarterly for Exercise and Sport, 74,* 173-182. PMid:12848230

Pavot, W., & Diener, E. (1993). Review of the Satisfaction with Life Scale. *Psychological Assessment, 5,* 164-172. doi:10.1037/1040-3590.5.2.164

Pelletier, L. G., Fortier, M., Vallerand, R. J., & Briere, N. M. (2001). Associations among perceived autonomy support, forms of self-regulation, and persistence: A prospective study. *Motivation and Emotion, 25*(4), 279-306. doi:10.1023/A:1014805132406

Penedo, F. J., & Dahn, J. R. (2005). Exercise and well-being: a review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry, 18*(2), 189-193. doi:10.1097/00001504-200503000-00013

Quested, E., & Duda, J. L. (2009). Perceptions of the motivational climate, need satisfaction and the indices of well- and ill-being among hip hop dancers. *Journal of Dance Medicine and Science, 13,* 10-19. PMid:19416610

R Development Core Team (2005). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL http://www.R-project.org.

Reinboth, M., Duda, J. L., & Ntoumanis, N. (2004). Dimensions of Caching Behavior, Need

Satisfaction, and the Psychological and Physical Welfare of Young Athletes. *Motivation and Emotion, 28*(3), 297-313. doi:10.1023/B:MOEM.0000040156.81924.b8

Ryan, R. M., & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist, 55*(1), 68-78. doi:10.1037/0003-066X.55.1.68

Salmon, J.J., Bauman, A., Crawford, D. & Timperio, A. (2000). The association between television viewing and overweight among Australian adults. *International Journal of Obesity and Related Metabolic Disorders, 24*(5), 600-607. doi:10.1038/sj.ijo.0801203

Sarrazin, P., Vallerand, R. J., Guillet, E., Pelletier, I. G., & Cury, F. (2002). Motivation and dropout in female handballers: A 21-month prospective study. *European Journal of Social Psychology, 32*, 395-418. doi:10.1002/ejsp.98

Scanlan, T., Carpenter, P., Schmidt, G., Simons, J., & Keller, B. (1993) An introduction to the sport commitment model. *Journal of Sport and Exercise Psychology, 15,* 1-15.

Sheldon, K., Elliot, A., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology, 80*, 325-339. doi:10.1037/0022-3514.80.2.325

Standage, M., Duda, J. L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. *Journal of Educational Psychology, 95*(1), 97-110. doi:10.1037/0022-0663.95.1.97

Standage, M., Duda, J. L., & Ntoumanis, N. (2005). A test of self-determination theory in school physical education. *British Journal of Educational Psychology, 75*, 411-433. doi:10.1348/000709904X22359

Thogersen-Ntoumanis, C., & Ntoumanis, N. (2007). A Self-Determined Theory approach to the study of body image concerns, self-presentation and self-perceptions in a sample of aerobic instructors. *Journal of Health Psychology, 12,* 301-315. doi:10.1177/1359105307074267

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), Advances in experimental social psychology (Vol. 29, pp. 271-360). Sand Diego: Academic Press.

Vallerand, R. J. (2001). A hierarchical model of intrinsic and extrinsic motivation in sport and exercise. In G. C. Roberts (Ed.), Advances in motivation in sport and exercise (pp. 263-320). Champaign, IL: Human Kinetics.

Vallerand, R. J., & Losier, G. F. (1999). An integrative analysis of intrinsic and extrinsic motivation. *Journal of Applied Sport Psychology, 11*, 142-169. doi:10.1080/10413209908402956

Vansteenkiste, M., Matos, L., Lens, W., & Soenens, B. (2007). Understanding the impact of intrinsic versus extrinsic goal framing on exercise performance: The conflicting role of task and ego involvement. *Psychology of Sport & Exercise, 8*(5), 771-794. doi:10.1016/j.psychsport.2006.04.006

Vlachopoulos, S. P., Karageorghis, C. I., & Terry, P. C. (2000). Motivation profiles in sport: A Self-Determination Theory perspective. *Research Quarterly for Exercise and Sport, 71*, 387-397. PMid:11125536

Wilson, P. M., & Rodgers, W. M. (2002). The relationship between exercise motives and physical self-esteem in female exercise participants: An application of self-determination theory. *Journal of Applied Biobehavioral Research, 7,* 30-43.

Wilson, P. M., & Rodgers, W. T. (2008). Examining the relationships between perceived psychological need satisfaction and behavioral regulation in exercise. *Journal of Applied Biobehavioral Research, 13*(3), 119-142. doi:10.1111/j.1751-9861.2008.00031.x

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

Wilson, P. M., Rogers, W. T., Rodgers, W. M., & Wild, T. C. (2006). The Psychological Need Satisfaction in Exercise Scale. *Journal of Sport & Exercise Psychology*, *28*(3), 231-251.

Table 1

Means, sd, alpha levels of latent constructs, Time 1 and Time 2

	Time 1 (pre-intervention)			Time 2 (post-intervention)		
Construct	Mean	SD	α	Mean	SD	α
Caring	3.92	.64	.94	4.10	.61	.85
Task	3.36	.60	.89	3.54	.64	.94
Ego	2.92	.55	.88	2.69	.69	.94
Autonomy	4.40	.76	.76	4.38	.62	.94
Competence	4.10	.78	.90	4.37	.62	.94
Relatedness	3.53	.97	.90	3.75	.82	.90
Intrinsic	3.72	.87	.83	3.97	.66	.71
Extrinsic	2.04	.85	.79	2.00	.94	.79
Commitment	3.74	.84	.74	4.11	.63	.85
Life	5.22	1.09	.70	5.43	.93	.78
Body	5.76	1.44	.72	5.54	1.19	.80

Note. Body image reported on 9-point Likert scale. All other scales reported on 5-point Likert scale.

Table 2

Fit Indices for the Pre-Post Confirmatory Factor Analysis

Model	χ^2	df	*p*	$\Delta\chi^2$	*p*	RMSEA	RMSEA 90% CI	SRMR	CFI	TLI	Tenable?
Alternative Null	47608.380	2220	.000	---	---	---	---	---	---	---	---
Configural Invariance	5591.051	1815	.000	---	---	.052	.050-.053	.040	.917	.944	---
Weak Invariance	5851.364	1837	.000	---	---	.053	.051-.055	.043	.912	.900	Yes
Partial Strong Invariance[1]	6179.631	1856	.000	---	---	.055	.053-.056	.044	.905	.886	Yes
Homogeneity of Variances[2]	5999.252	1848		147.888	.000	.054	.052-.055	.054	.899	.882	No
Homogeneity of Variances/Covariances[2]	8740.022	2025		2560.391	.000	.063	.062-.065	.119	.853	.898	No
Equality of Means[2]	6329.996	1867		150.365	.000	.055	.054-.057	.055	.891	.875	No

[1]Allowing first and second parcel on intrinsic to freely estimate
[2]Evalued with the χ^2 Difference Test

Table 3

Loading and Intercept Values, Residuals and R^2 Values for Each Indicator, and the Estimated Latent Variance from the Strong Metric Invariance Model

	Equated Estimates		Standardized	Pre		Post	
Indicator	*Loading (SE)*	*Intercept (SE)*	*Loading*[a]	*Theta*	R^2	*Theta*	R^2
Caring (Care): Estimated Latent Variance (Pre =1 .00; Post = 1.01)							
Care1	.60 (.02)	3.92(.02)	.94(.01)	.12	.89	.12	.88
Care2	.63 (.02)	3.91(.02)	.94(.01)	.12	.88	.09	.91
Care3	.63 (.02)	3.91(.02)	.94(.01)	.12	.88	.15	.85
Task-Involving (Task): Estimated Latent Variance (Pre = 1.00; Post = 1.54)							
Task1	.55(.02)	3.41(.02)	.87(.01)	.25	.75	.13	.88
Task2	.58(.02)	3.36(.02)	.92(.01)	.16	.84	.07	.93
Task3	.62(.02)	3.31(.02)	.90(.01)	.19	.81	.02	.88
Ego-Involving (Ego): Estimated Latent Variance (Pre = 1.00; Post = 1.71)							
Ego1	.51(.02)	2.77(.023)	.68(.02)	.54	.46	.30	.71
Ego2	.63(.02)	2.94(.024)	.90(.01)	.20	.80	.10	.91
Ego3	.62(.02)	2.99(.024)	.88(.01)	.23	.77	.12	.88
Autonomy (Aut): Estimated Latent Variance (Pre = 1.00; Post = 1.01)							
Aut1	.68(.02)	4.41(.03)	.89(.01)	.20	.80	.17	.83
Aut2	.66(.02)	4.35(.03)	.89(.01)	.21	.79	.20	.80
Aut3	.68(.02)	4.37(.03)	.89(.01)	.21	.79	.18	.82
Competence (Com): Estimated Latent Variance (Pre = 1.00; Post = .73)							
Com1	.70(.02)	4.16(.03)	.86(.01)	.25	.75	.18	.82
Com2	.78(.02)	4.02(.03)	.89(.01)	.21	.79	.23	.77

1	Com3	.79 (.02)	4.06 (.03)	.89(.01)	.20	.80	.15	.85
2	Relatedness (Rel): Estimated Latent Variance (Pre = 1.00 Post = .85)							
3	Rel1	.97(.03)	3.37(.04)	.86(.01)	.25	.75	.27	.73
4	Rel2	1.01(.03)	3.51(.04)	.92(.01)	.15	.85	.15	.91
5	Rel3	.81(.03)	3.65(.03)	.85(.01)	.28	.72	.30	.70
6	Intrinsic Motivation (Int): Estimated Latent Variance (Pre = 1.00; Post = 1.28)							
7	Int1	.67(.02)	3.97(.03)	.79(.02)	.38	.62	.03	.70
8	Int2	.59(.03)	2.90(.04)	.54(.02)	.71	.29	.58	.42
9	Int3	.74(.03)	4.03(.03)	.85(.02)	.27	.73	.35	.65
10	Extrinsic Motivation (Ext): Estimated Latent Variance (Pre = 1.00; Post = .89)							
11	Ext1	.66(.03)	1.91(.03)	.68(.02)	.54	.46	.45	.55
12	Ext2	.75(.03)	2.04(.04)	.72(.02)	.49	.51	.48	.52
13	Ext3	.88(.04)	2.26(.04)	.78(.02)	.40	.60	.40	.60
14	Commitment to Exercise (Commit): Estimated Latent Variance (Pre = 1.00; Post = .75)							
15	Commit1	.87(.03)	3.58(.04)	.85(.01)	.28	.72	.18	.82
16	Commit2	.65(.02)	4.07(.03)	.79(.02)	.37	.63	.39	.61
17	Commit3	.56(.02)	3.72(.03)	.68(.02)	.54	.46	.57	.43
18	Satisfaction with Lie (Life): Estimated Latent Variance (Pre = 1.000; Post = .8)							
19	Life1	1.032(.04)	5.18(.04)	.82(.01)	.33	.67	.34	.66
20	Life2	1.06(.03)	5.28(.04)	.91(.02)	.17	.83	.20	.81
21	Life3	.97(.04)	5.14(.05)	.76(.02)	.43	.58	.43	.57
22	Body Image (Body): Estimated Latent Variance (Pre = 1.00; Post = .71)							
23	Body1	1.26(.04)	5.80(.05)	.85(.02)	.27	.73	.50	.50

Body2	1.28(.04)	5.58(.05)	.90(.01)	.19	.81	.22	.78	
Body3	1.51(.05)	5.87(.06)	.88(.01)	.22	.78	.47	.53	

[a] Common Metric Completely Standardized Solution

Table 4

Changes in latent means between Time 1 (pre-intervention) and Time 2 (post-intervention)

Construct	*Means Difference*	*Standard Error*	*Estimated S.E.*	*p*	*Cohen's d*
Caring-Post	0.29	.04	6.88	.00	.28
Task-Post	0.28	.04	6.34	.00	.28
Ego-Post	-0.34	.05	-6.83	.00	.29
Auton- Post	-0.08	.05	-1.53	.13	.04
Compet-Post	0.37	.05	7.67	.00	.37
Relate- Post	0.42	.05	8.58	.00	.24
Intrinsi- Post	0.21	.05	4.01	.00	.28
Extrinsi- Post	-.07	.05	-1.48	.14	.04
Comit- Post	0.43	.04	9.89	.00	.50
Life- Post	0.10	.05	2.24	.02	.20
Body- Post	-.22	.05	-4.57	.00	.17

Table 5

Correlations between Latent Constructs for Time 1(upper triangle) and Time 2 (lower triangle), Change Model

Care = Caring Climate Pre; Task = Task-involving Climate Pre; Ego= Ego-involving Climate Pre; Aut = Autonomy Pre; Com = Competence Pre; Int = Intrinsic Motivation Pre; Ext = Extrinsic Motivation Pre; Commit = Commitment to Exercise Pre; Life = Life Satisfaction Pre; Body = Body Image Pre.

	Care	Task	Ego	Aut	Com	Rel	Int	Ext	Commit	Life	Body
Care	1.00	.49*	-.16*	.23*	.22*	.24*	.02	.06	.00	.22*	.19*
Task	.40*	1.00	.01	.20*	.26*	.35*	.07	.04	.14*	.14*	.18*
Ego	-.26*	-.59*	1.00	-.18*	-.06	-.04	-.06	.20*	-.07	-.13*	.03
Aut	.18*	.18*	-.19*	1.00	.62*	.18*	.37*	-.27*	.29*	.23*	.18*
Com	.09	.19*	-.18*	.48*	1.00	.45*	.50*	-.12*	.55*	.32*	.30*
Rel	.05	.16*	-.16*	.38*	.43*	1.00	.20*	-.11*	.27*	.19*	.10
Int	.13*	.18*	-.17*	.26*	.18*	.15*	1.00	.01	.82*	.19*	.10
Ext	.04	.07	.03	-.18*	-.11	-.01	-.12	1.00	-.01	-.01	-.15*
Commit	.15*	.10*	-.16	.25*	.09	.16*	.65	-.18*	1.00	.16*	.22*
Life	.23*	.21*	-.17*	.08	.14*	.05	.19*	-.13*	.20*	1.00	.36*
Body	.21*	.29*	-.15*	.13*	.10*	.10*	.20*	-.15*	.23*	.49*	1.00

*Note. * p < .01; Time 1 (upper triangle); Time 2 (lower triangle).*

Figure Caption

Figure 1a: ½ Longitudinal Change Model.

Figure 1b: Direct Paths Between Motivational Climate and Well-being Measures.

Task = Task-involving Climate; Ego= Ego-involving Climate; Caring = Caring Climate; Autonomy = Autonomy Basic Psychological Need; Competence = Competence Basic Psychological Need; Intrinsic = Intrinsic Motivation; Extrinsic = Extrinsic Motivation; Commit = Commitment to Exercise; Life = Life Satisfaction; Body Image = Body Image State.

Note: Correlation paths are not represented in this model but are present in the analysis.

Figure 1a:

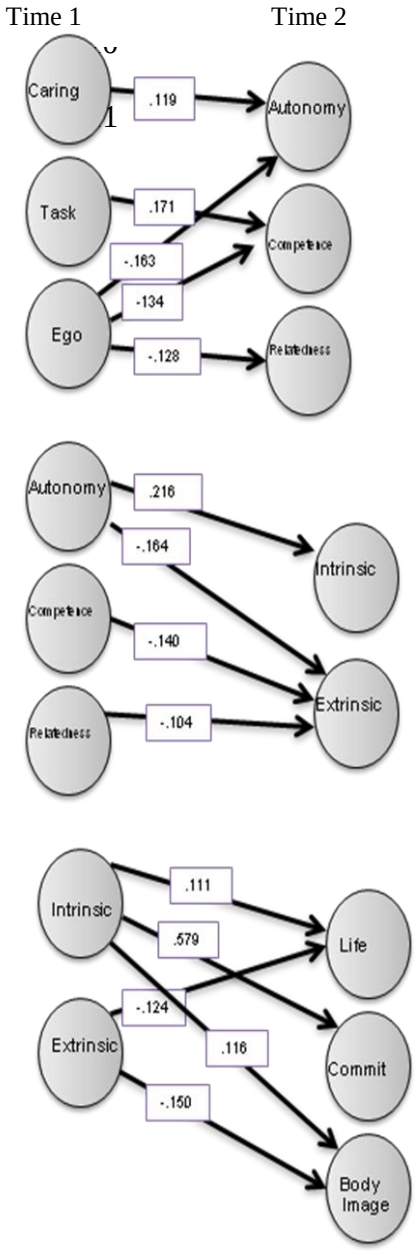
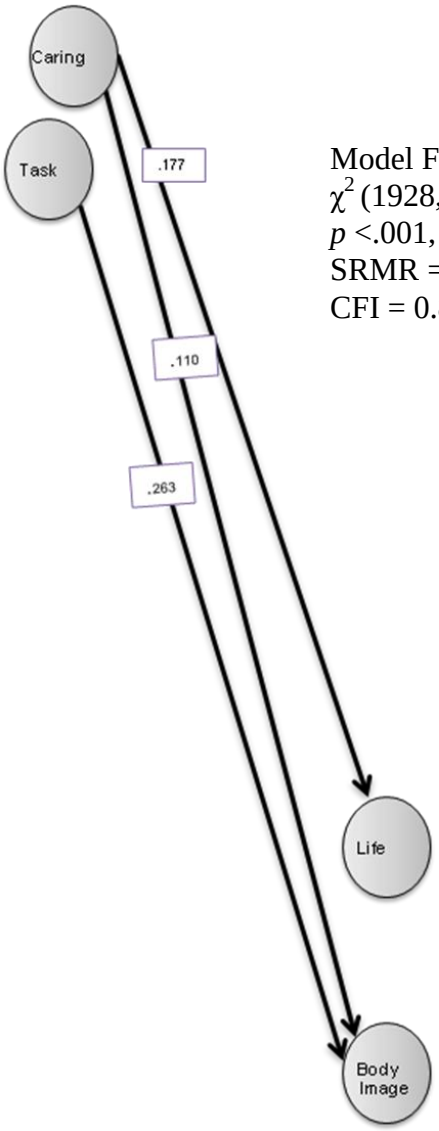


Figure 1b:



Model Fit:
χ^2 (1928, n = 779) =6205.722, p <.001, RMSEA = .053, SRMR = .061, TLI = 0.876, CFI = 0.888

Examining the Effects of an Intervention with Recreation Center Staff to Foster a Caring, Task-involving Climate

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Abstract

While extensive research in physical activity settings has revealed positive benefits when members perceive both a task-involving and caring climate, little is known about the specific behaviors in which individuals engage to influence those perceptions. The purpose of this study was to examine specific behaviors in which both staff and members of a university recreation center engage both before and after an intervention designed to increase members' perceptions of a caring and task-involving climate as well as decrease perceptions of an ego-involving climate. A ½ longitudinal design was examined using structural equation modeling to determine whether perceptions of staff behaviors at Time 1 influenced perceptions of climate, and likewise whether perceptions of climate at Time 1 influenced members' behaviors. Results revealed that the intervention did increase perceptions of the caring and task-involving climate while reducing perceptions of the ego-involving climate. The final model demonstrated acceptable fit (χ^2 (378, n = 779)= 1462.277, p = <.001, RMSEA = .061, SRMR=.045, TLI = 0.948, CFI = 0.955), and indicated that staff behaviors predicted perceptions of the task-involving (β = .32, p = .00), ego-involving (β = .19, p = .00) and caring climates (β = .30, p = .00). Likewise, perceptions of the ego-involving climate negatively predicted members' behaviors (β = -1.01, p = .00). Neither perceptions of the task-involving, caring climate nor staff behaviors significantly predicted members' post-intervention behaviors. Both the implications of the success of the intervention as well as the support for how members and staff behaviors contribute to the overall climate are discussed. Results offer suggestions for recreation center staff behaviors to influence members' exercise experiences.

Examining the Effects of an Intervention with Recreation Center Staff to Foster a Caring, Task-involving Climate

Physical inactivity has been identified as a major health risk behavior for college students (American College Health Association, 2002). Health professionals have advocated for researchers to identify ways to increase physical activity among otherwise sedentary college students suggesting that increasing exercise interest during the college years may foster a lifelong commitment to physical activity (Keating, Guan, Pinero, & Bridges, 2005; Wallace, Buckworth, Kirby & Sherman, 2000). One way to influence physical activity behaviors is to consider individuals' perceptions of the climate where they engage in physical activity. Previous research on motivational climates has found that perceptions of a task-involving climate have been linked to greater commitment to exercise (Ferrer-Caja & Weiss, 2000; Standage, Duda & Ntoumanis, 2003); however little is known about specific behaviors that exercise professionals engage in to create such a climate. Given that the college years may be a pivotal time for influencing a lifelong commitment to exercise, the purpose of this study was to examine the specific behaviors in which individuals engage to create a caring and task-involving climate.

Achievement Goal Perspective Theory (AGPT; Nicholls, 1984; 1989) provides a social-cognitive theoretical framework that offers insight into how to structure an exercise environment to maximize motivation. Individuals can perceive either task- or ego-involving climates in exercise settings. In task-involving climates, fitness staff emphasize effort and improvement as markers of success, foster cooperation among peers and make everyone feel valued and welcome. In contrast, in ego-involving climates, fitness staff focus on individuals who have the highest ability and/or best performances. They also encourage rivalry among peers and members

feel conscious or embarrassed when they do not know how to use a piece of equipment or perform a particular skill (Huddleston, Fry, & Brown, 2011).

Across physical activity settings, perceptions of a task-involving climate have been associated with higher perceived competence, persistence when faced with a difficult task and more enjoyment and interest in the given activity (Duda & Nichols, 1992; Ommundsen, Roberts, Lemyre, & Treasure, 2004; Walling & Duda, 1995). Conversely, perceptions of an ego-involving climate have been associated with avoidance of challenging tasks, exertion of less effort when perceived ability is low and higher levels of extrinsic motivation for participating (Standage & Treasure, 2002; Wang & Biddle, 2001; Whitehead, Andree & Lee, 2004).

Another approach that has recently been examined in the motivational climate literature in physical activity settings considers the extent to which individuals perceive the climate to be caring. A caring climate has been defined as one in which individuals perceive an inviting, welcoming atmosphere where they feel a sense of belonging and where others in the setting have a genuine concern for their well-being (Magyar et al., 2007). Researchers have suggested that when individuals feel cared for in physical activity settings, their likelihood for engaging in future physical activities is enhanced. For example, Newton, Watson, et al. (2007) found that youth sport camp participants who perceived a caring climate reported a greater desire for future participation. In addition, Gano-Overway, et al., (2009) found that youth perceiving a caring environment in a summer sport camp reported they were better able to regulate their positive emotions.

While research has suggested positive benefits in emphasizing both caring and task-involving climates, limited research exists assessing the very specific behaviors fitness activity professionals engage in to foster caring, task-involving environments. Since perceptions of the

motivational climate are a strong predictor of motivation toward a particular activity (Brunel, 1999), understanding the behaviors leaders engage in to reflect a caring, task-involving climate is an important area of inquiry in sport and exercise psychology. Such information could be an important tool for individuals interested in fostering the motivational climate in exercise settings.

Although not specifically targeting exercise climates, previous research may offer insight into specific behaviors linked to both caring and task-involving perceptions in physical activity settings. For example, Larson (2006) was interested in physical education (PE) teachers and their caring behaviors. She asked elementary and secondary students to identify caring behaviors displayed by their PE teachers. Using content analysis, the following themes emerged: recognized me, trusted/respected me, helped me learn and paid attention to me. These suggestions offer specific behaviors leaders in exercise settings might engage in to create a climate of caring.

Likewise, in the sport domain, Smith, Fry, Ethington and Li (2005) were interested in the antecedents of high school female athletes' perceptions of the motivational climate. Specifically, the researchers examined how athletes' perceptions of their coaches' behaviors predicted their perceptions of the motivational climate. When athletes perceived that their coaches provided positive and encouraging feedback and did not ignore mistakes, they were more likely to perceive a task-involving climate on their teams. Conversely, athletes who perceived their coaches gave less positive feedback and higher punishment had a greater tendency to perceive an ego-involving climate. These ideas can also be implemented in exercise climates where feedback can be offered by fitness staff. The researchers suggested that intervention studies would further an understanding of how to assist those interested in creating a task-involving climate in physical activity settings.

Previous research has revealed that interventions aimed at creating task-involving and caring climates have been successfully implemented in physical activity contexts. For example, Digelidis, Papaioannou and Christodoulidis (2003) assessed the effects of a year-long intervention with junior high students in physical education classes and concluded that physical educators creating a positive, task-involving motivational climate positively influenced students' attitudes towards exercise. Further, at the end of the intervention, participants in the experimental group perceived that their teachers emphasized more task-involvement and put less emphasis on ego-involvement than the control group.

Other researchers have also demonstrated that task- and ego-involving climates can be purposefully manipulated. For example, Barkoukis, Tsorbatzoudis and Groulos (2008) found that an intervention manipulating the motivational climate to emphasize high task-involvement in physical education classes resulted in more positive outcomes for high school students such as high enjoyment and perceived competence among students in the intervention classes. Lloyd and Fox (1992) examined adolescent females' experience in a 6-week aerobic fitness course and found that those in the high task-involving class enjoyed the course more and were more motivated to continue aerobics compared to those in the ego-involving course. These studies demonstrate that manipulation of the motivational climate is possible.

Interventions involving caring climates have also proved successful. Specifically, Newton, Watson, et al., (2007) implemented a caring-based activity program and compared the caring-based program with those in a control group. The participants included multiethnic youth enrolled in two National Youth Sport Programs. The caring-based intervention involved four principle components: 1) building staff community (i.e., working together as a staff to learn best practices for interacting with youth); 2) literature-based support (i.e., reading about best

strategies for engaging youth); 3) student-centered learning strategies (i.e., learning ways to provide autonomy, support and decision-making opportunities for the youth); and 4) caring discipline (i.e., enforce disciplinary measures in a caring way to the youth). Results indicated that those in the intervention group perceived a higher caring climate compared to the control, and those in the caring climate reported expected future participation and lower levels of a perceived ego-involving climate. These strategies demonstrate how an intervention focused on a caring component could be structured in a physical activity setting.

While promising results can be found with both caring climate and task-involving climate interventions, research considering both simultaneously has not been explored. Although the characteristics of caring and task-involving climates compliment one another (Newton, Fry, et al., 2007), research is needed to examine the overall affect of a caring, task-involving climate on motivational outcomes. In addition, throughout the intervention-based research examples described above, the specific behaviors in which leaders/coaches engaged was not explicitly studied.

The recreation center found on most college campuses may be an ideal setting for targeting a motivational climate intervention. Unfortunately, caring and task-involving climates are not always emphasized in exercise facilities. If a pervasive, intentional effort is not made to create a caring and task-involving climate, a culture where competitiveness, normative comparisons and emphasis on external appearances can easily develop. This could result in some individuals (e.g., perhaps those who are the least fit or physically skilled) feeling less comfortable at a recreation center and choosing not to participate in regular exercise.

Further, although both AGPT and caring climates offer insight into individuals' motivation and behaviors in physical activity contexts, few studies have attempted to integrate

the theoretical concepts. Little is known regarding the specific behaviors staff and members engage in when exposed to an exercise facility trained to create a positive, warm, welcoming and supportive atmosphere. Specifically, if staff at a recreation center engage in behaviors that reflect a caring (e.g., are friendly, call members by name, indicate they are available to help) and task-involving climate (e.g., notice members' improvements, encourage members to support one another on fitness goals, etc), then members' should perceive a high caring and task-involving climate in the facility. In addition, if members are exposed to a caring and task-involving climate, it follows that they might be more likely to demonstrate caring and task-involving behaviors (e.g., be friendly, call members and staff by name, help others when appropriate, etc) when exercising at the facility, so that everyone is contributing to the overall positive and supportive atmosphere. From an applied point of view, such information would be useful in determining how to foster a positive, supportive motivational climate. Staff members who engage in behaviors associated with caring, task-involving climates may influence members' experiences and future behaviors regarding the exercise activity.

Thus, the purpose of this research was to assess the relationship between perceptions of staff behaviors, member' behaviors and perceptions of the climate in a university recreation center facility. Member's and staff's behaviors were considered from the member's perspective. It was hypothesized that (a) staff's behaviors pre-intervention would predict perceptions of the climate post-intervention and (b) perceptions of the climate pre-intervention would predict member's behaviors post-intervention.

Method

Participants

Current student members (*N*=779; $\bar{x}$ = 20.33 years, sd=3.307; n= 390 females & 300 males, 89 unknown) of a university student recreation center were invited to complete a survey prior to an intervention with the staff (i.e., staff were trained to create a positive, caring, task-involving climate). Following the intervention, the same students were contacted to complete the post survey. Only students who utilized the fitness center at least five times since the intervention were included in the post survey responses. The survey contained the same measurements pre and post. Of those contacted, 282 completed the post survey, which was a 36% completion rate.

Procedure

Data collection. Utilizing both a written and on-line format, pre surveys were collected for several weeks prior to the intervention. The training sessions took place over the course of one month and post surveys were collected a minimum of 6-weeks following the last training session for a period of four weeks. Participants were recruited at the entrance of the student recreation center. A small incentive (i.e, pre survey granola bar; post survey water bottle) was provided to those completing the surveys.

Intervention. The target recreation center for this study had a small full-time staff and while the staff's background in recreation administration and exercise science was extensive, they did not have a staff member with exercise psychology expertise. Further, over 150 student employees were utilized to help with day-to-day functioning of the center, who brought with them varying degrees of interest and knowledge of health and fitness. At times, the full-time staff perceives a lack of enthusiasm and ownership from the student staff. They had voiced that the student staff often lacked a "passion" for making the recreation center a welcoming and supportive environment.

In order to give the targeted recreation center the background and tools necessary to enhance the overall climate, an intervention was delivered to both the student and full-time staff of the facility. The intervention occurred throughout the Spring semester of the academic year and included twelve training sessions for staff of the recreation center. The intervention was tailored to meet the unique needs of each of the specific staffs (e.g., personal trainers, group fitness instructors, facilities, technology committee, front desk operators, etc). Regardless of specific staff groups, however, the intervention incorporated the following main themes, based on the theoretical tenets of AGPT (Nicholls, 1984; 1989), the caring literature (Battistich & Solomon, 1997; Noddings, 1984, 1992), and research findings (Larson, 2006; Newton, Duda & Yin, 2000; Newton, Fry, et al., 2007; Huddleston, Fry & Brown, 2009):

1. Encouraging personal bests;
2. Fostering cooperation among members;
3. Emphasizing a warm, welcoming atmosphere;
4. Making each member feel valued and welcomed;
5. Avoiding normative comparisons among members;
6. Acknowledging mistakes are part of the learning process and happen to everyone in the exercise setting;
7. Creating an atmosphere built on caring principles (i.e., recognizing, trusting, respecting and paying attention to others).

In addition to the overall themes, specific suggestions were created by a team of researchers in sport and exercise psychology for the job responsibilities of each individual staff (e.g., front desk workers should smile and make eye contact with each person entering the facility; aerobics instructors should strive to learn the names of every class member; personal

trainers should notice and comment on individual improvements; etc). While individual staff training sessions lasted approximately 60 minutes, the full-time staff also received a manual on ways to continue the themes that emerged during the training throughout the year as well as ideas on how to incorporate the material in their annual orientation sessions. Also, the research team had an on-going presence in the recreation center to offer follow-up assistance in emphasizing a caring, task-involving climate.

Measures (Pre and Post)

The pre- and post-surveys included the following measures:

Motivational Climate. The motivational climate was measured with the 27-item PMCEQ, developed by Huddleston, et al. (2011) for use with corporate fitness programs. The PMCEQ measures the extent to which members perceive a task versus ego-involving climate in a given setting. Sample items include, "the staff encourages students to try new skills" (task) and "students are encouraged to do better than other students" (ego). The stem "In the rec" was used to remind participants to consider their experience specifically at the student recreation facility when completing the survey. The questionnaire uses a 5-point Likert response scale, with options ranging from 1 = strongly disagree to 5 = strongly agree. Items are summed and divided by the number of items in the respective scales to achieve a total task and ego scale score. Huddleston, et al. reported internal consistency for the task-involving and ego-involving scales at .88 and .86, respectively.

Caring Climate. The Caring Climate Scale (Newton, Fry, et al., 2007) measures the extent to which participants perceive an environment to be caring. This 13-item scale measures the participants' perceptions of multiple caring elements, including support, concern, and acceptance. The stem, "In the Student Recreation Center (the rec). . . ", was used and sample

items include, “students are treated with respect” and “the staff are kind to students”. Participants respond to the items based on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly degree. Items are summed and divided by 13 to achieve a mean caring climate score. Previous research has supported the reliability and validity of the CCS (Newton, et al., 2007; Gano-Overway, et al., 2009).

Specific Behaviors of Staff. To measure members’ perceptions of the specific behaviors of the staff and their impression of the SRC climate, a 17-item measure was developed. Item development for the Specific Behaviors of Staff questionnaire is based on the situational structures suggested to underlie both the motivational and caring climate as demonstrated by previous research (e.g., Seifriz, et al., 1992; Gano-Overway, et al., 2009). The items were created using the suggestions and interests of the targeted facility and then analyzed by a panel of faculty and graduate students in sport and exercise psychology to establish face validity. The panel classified each item onto one of the proposed characteristics of task-involving or caring climates. Items only remained when there was 100% agreement among the panel members. This 15-item measure focuses on the specific targeted behaviors the staff should exhibit as a result of the caring and task-involving climate intervention. Participants are asked to read each item and indicate on a 5-point rating scale, 1 = Strongly Disagree to 5 = Strongly Agree, how much each item describes their behavior (see Table 1 for the questionnaire).

Specific Behaviors of Members. To measure members’ perceptions of their own behaviors at the recreation center, a 10-item measure was created for this study. Item development for the Specific Behaviors of Members questionnaire is based on the situational structures suggested to underlie both the motivational and caring climate as demonstrated by previous research (e.g., Seifriz, et al., 1992; Walling, et al., 1993; Gano-Overway, et al., 2009).

Similar to the Specific Behaviors of Staff questionnaire, the items were created based on the suggestions of the targeted facility and were analyzed by the same sport and exercise psychology faculty and graduate students to establish face validity. This 10-item measure focuses on the specific targeted behaviors of how members interact, which reflect the goals for the caring and task-involving climate intervention. Participants are asked to read each item and indicate on a 5-point rating scale, 1 = Strongly Disagree to 5 = Strongly Agree, how much each item describes their behavior (see Table 2 for the questionnaire).

Demographics. Participants were asked to report their age, gender, how often they used the recreation center and what activities they usually engaged in while visiting.

Missing Data

The data set had a moderate amount of missing at random data (i.e., .3 fraction of missing information) and therefore 100 imputations were run (Graham, Olchowski & Gilreath, 2007) using Amelia within the R program (R Development Core Team, 2005). All of the information within the data set were used to impute the missing data, thus improving the model's ability to calculate unbiased parameter estimates (Graham, Cumsille & Elek-Fisk, 2003). The imputed data set was stacked, and then used to create a single covariance matrix, known as the "super matrix" approach (T. Little, personal communication, September 1, 2010).

Analysis

Structural equation modeling (SEM) was used to examine the research questions using MPlus 6 (Muthén & Muthén, 2008). An advantage of SEM is that factorial invariance can be established by comparing factor loadings and intercepts across Time (Kline, 2011). To test the proposed hypotheses, the following steps were taken: (a) a test of the measurement model that specified the relationship between indicators (e.g., observed variables) and latent constructs (e.g.,

unobserved variables); (b) a test of the measurement equivalence in the measurement of these models; (c) tests of the structural models that specify the regression relationships between the latent constructs (Brown, 2006; Kline, 2011; Little, 1997).

Parcels (i.e., averaging the sum of two or more indicators) were created to form three manifest indicators for each of the latent constructs. Parceling offers advantages over item-level modeling such as reduced risk for dual loadings of indicators, reductions in sampling error and allowing models to be just-identified (Little, in press). To create parcels for each latent construct, the item-to-construct balancing technique was utilized (Little, et al., 2002). In addition, to set the scale, the fixed factor method was utilized, which fixes the psi on each latent construct to 1.0 (Kline, 2011).

In the measurement model, there were a total of 10 latent constructs, 5 representing Time 1 and the same constructs repeated in Time 2. The latent constructs were as follows: three representing perceptions of the climates (caring, task, ego), members' perceptions of staff behaviors (staff) and members' perceptions of their own behaviors (member).

Results

Means, standard deviations and alpha levels for each of the latent constructs are reported in Table 3. The results of the measurement models and structural models are reported separately.

Measurement Model

The factorial validity of each construct (i.e., task-involving, ego-involving, caring, staff behaviors and members' behaviors) was analyzed to determine loading and intercept invariance using pre and post data. No out-of-range responses were observed and univariate distributions approximated normality so therefore, maximum likelihood (ML) estimation was used to estimate the fit of the proposed model to the data (Kline, 2010). To evaluate the overall fit of the models,

a covariance matrix was used as well as the following fit indices: comparative fit index (CFI; Hu & Bentler, 1998), Tucker-Lewis index (TLI; Tucker & Lewis 1973), and root means square error of approximation (RMSEA; Steiger & Lind, 1980). It is generally accepted that a plausible model maximizes CFI and TFI values (values approaching 1.0 are interpreted as good model fit) and minimizes RMSEA values (values very close to 0 suggest good model fit) (Brown, 2006).

Following standard procedures to evaluate measurement invariance, the loadings (weak invariance) and intercepts (strong invariance) were equated. Results, shown in Table 3, found no significant changes based on two criteria: (a) the RMSEA Model Test, in which the RMSEA value of the nested model is examined to determine if the value falls within the 90% confidence interval of the comparison model (Little, 1997) and (b) the CFI change, in which the nested model value should not change more than .01 compared to the comparison (Cheung & Rensvold, 2002). The tests of weak and strong invariance revealed that the constructs were measured the same across Time. The loading, intercept, residual, and squared multiple correlation values for each indicator, along with the variance for each latent construct in the strong metric invariant model, are presented in Table 4.

The homogeneity of the variances and covariances of the latent constructs were also measured to determine whether parameter estimates were equal across Time. The test revealed a change did occur as evident by the differences between variance and covariance matrixes as well as between means (see Table 3). The homogeneity of parameters suggested that a change occurred between pre and post intervention. All latent constructs, with the exception of perceptions of the ego-involving climate, demonstrated a positive significant increase in means. Perceptions of the ego-involving climate significantly decreased post-intervention.

Structural Model

To determine the relationships between staff's behavior and perceptions of the climate on member's behavior, auto-regressive and cross-lagged paths were added to the longitudinal model allowing the model to control for prior levels on the constructs. Cross-lagged paths included the direct effect of pre-staff behaviors on post-perceptions of climate (i.e., task-involving, ego-involving and caring) as well as pre-perceptions of climate on post-member's behaviors.

The final structural model with all cross-lagged and auto-regressive paths demonstrated acceptable fit (χ^2 (378, n = 779)= 1462.277, p = <.001, RMSEA = .061, SRMR=.045, TLI = 0.948, CFI = 0.955). Staff behaviors predicted perceptions of the task-involving (β = .316, p = .00), ego-involving (β = .138, p = .00) and caring climates (β = .303, p = .000). Perceptions of the ego-involving climate negatively predicted members' behaviors (β = -1.012, p = .000). Neither perceptions of the task-involving, caring climate nor staff behaviors significantly predicted members' post-intervention behaviors. The final ½ longitudinal model, including Time 1 and Time 2 correlations, is presented in Figure 1.

Discussion

The purpose of this study was to assess how staff behaviors and perceptions of the climate might influence members' behaviors at a university recreation center. The data was collected from members and an intervention took place between the pre and post surveys to determine whether training could influence members' perceptions of both staff and members' behaviors at the recreation center. It was first important to consider the factor structure of the instruments since both the staff's specific behaviors and member's specific behaviors questionnaires were created for this study. Results of the confirmatory factor analysis demonstrated support for the loading and intercept invariance, suggesting that the instruments were tenable to include in the longitudinal model.

The intervention involved staff training that targeted specific behaviors based on the theoretical tenants of Achievement Goal Perspective Theory (Nicholls, 1984; 1989) and research on caring climates (Newton, Fry, et al., 2007) in which the staff could engage in order to create a more caring and task-involving climate at the recreation center. After controlling for the auto-regressive and cross-lagged effects of members' prior perceptions of staff behaviors and climate, results revealed that staff's specific behaviors predicted perceptions of the task-, ego-involving and caring climates. In addition, members' perceptions of the ego-involving climate predicted their subsequent behaviors, such that the higher their perceptions of an ego-climate, the less likely the members were to engage in positive, supportive behaviors. The results suggest that when staff engage in positive, supportive behaviors, members are more likely to perceive a task-involving, caring climate. Moreover, staff behaviors did not predict members' behaviors directly, suggesting that perceptions of climate may mediate the relationship although future research designed to ensure stationarity is required to test mediation (Cole & Maxwell, 2003). Given the extensive research that has shown the positive benefits that occur when individuals perceive a task-involving (e.g., Digelidis, et al., 2003; Ommundsen, et al., 2004) and caring climate (e.g., Gano-Overway, et al., 2009; Magyar, et al., 2007) (i.e., greater competence, autonomy, intrinsic motivation, emotional regulation, pro-social behaviors, etc), recreation centers might consider the specific behaviors in which their staff engage and how those behaviors influence members' experiences.

Correlational analysis between both Time 1 (pre-intervention) and Time 2 (post-intervention) constructs revealed strong relationships between staff behaviors, members behaviors and perceptions of climate. Specifically considering post-intervention correlations, both staff's and members' behaviors were positively correlated with perceptions of the task-

involving and caring climate and negatively correlated with perceptions of the ego-involving climate suggesting that behaviors and perceptions of the climate are related. When staff engaged in particular behaviors targeting members' perceptions of the climate, the members were more likely to engage in those same behaviors. Likewise, when members perceived a high task-involving and caring climate as well as low ego-involving climate, they were more likely to engage in positive, supportive behaviors with one another. These findings are important to those working in fitness facilities and suggest that the members themselves reflect the type of climate they experience when staff model caring, supportive behaviors. If both members and staff exhibit friendly, inviting, positive attitudes, the climate they create may have implications for attracting future members and helping set the stage to move people to make positive lifestyle changes.

Final results also indicated that the intervention with the recreation center staff had an effect on the members. Specifically, members' perceptions of staff's and members' behaviors significantly increased as well their perceptions of the task-involving and caring climate. In addition, perceptions of the ego-involving climate significantly decreased. These results support other motivational climate studies (e.g., Barkoukis, et al., 2008; Newton, et al., 2007), demonstrating that perceptions of the task-involving, caring climate can be improved with proper training. However, unlike previous intervention strategies which have used longer time frames, the time frame devoted to the staff training for this particular study was minimal. The success of intervention training in influencing individuals' perceptions has implications for those engaged in exercise behavior research. The current study suggests that training sessions as minimal as 75 minutes with the facility staff may have an impact on members' experiences in student recreation centers.

The results of this study are of use to those interested in fostering a caring, positive, supportive environment in exercise facilities and give direction on ways to apply theoretical tenants to actual practice. The specific staff behaviors included on the questionnaire created for this study offer simple ideas for any recreation center to follow (see Table 1 for the full questionnaire) and are in line with the themes outlined by Huddleston, et al. (2011) for measuring a task-involving climate. Specifically, in order to foster perceptions of a task-involving climate, staff should engage in behaviors that emphasize making everyone feel valued/welcomed (e.g., "greets me warmly when I walk in the door"), focusing on best effort and improvement (e.g., "notices improvements I've made"), and promote a sense of cooperation (e.g., "introduces me to other members when appropriate"). Similarly, the items reflect behaviors that, if staff did not endorse, would increase members' perceptions of an ego-involving climate. In other words, if the staff did not engage in the specific behaviors identified in this study, it follows that members are more likely to feel conscious or embarrassed when they do not know how to perform a particular exercise, perceive the staff provides unequal recognition for accomplishments and feel the staff encourages intra-member rivalry.

The items for the staff and members' behaviors used in this study were developed to address the particular interests of the targeted fitness center. Some of the items may be more or less relevant if used in other fitness facilities (e.g., spitting in the water fountain). This item was included in the measure because the fitness center administration specifically identified it as a behavior their members found offensive yet seemed to occur with frequency at their location. In order to help fitness center staff utilize the instrument to gain applicable feedback, the items could be analyzed individually to determine which contribute most to perceptions of climate.

Such information could help fitness centers identify which behaviors in particular staff should focus their attention based on the needs of their particular facility.

Likewise, the results of the study offer behaviors staff could engage in to foster a caring environment. The educational philosopher Nel Noddings has suggested that, fundamentally, caring requires two individuals in the relationship, the care-giver and the care-receiver. Both the care-giver and care-receiver must be fully engaged and open to receiving the other (Noddings, 1984, 1992). Noddings' philosophical writings lay the groundwork to provide meaning and importance to the concept of caring in educational environments. Larson (2006) has explored a caring climate in physical education settings and found that students felt cared for when the physical education teacher took the time to know each student, treated each student with respect and showed a genuine interest in their learning and academic development. Similarly, researchers have found that students can readily remember and identify behaviors their teachers engage in that make them feel that their teachers authentically care about them and respond favorably to physical education teachers who engage in caring behaviors (Cothran & Ennis, 2000). Results of the current study support and extend these findings and suggest that the fitness staff play an important role for members. Specifically, their positive behaviors appear, in a sense, to be mimicked, so that members are more likely to engage in behaviors that enhance an overall positive climate in fitness facilities.

Study Limitations/Implications for Future Research

Several limitations of the current study should be noted for future research. First, the data was only collected at two time points, and thus a ½ longitudinal design could be constructed. Future research might consider adding a third time point so that the mediating effects of the task-, ego-involving and caring climates can be examined (Cole & Maxwell, 2003). It was interesting

that neither perceptions of the caring or task-involving climate predicted members' behaviors. Perhaps given the relatively moderate or neutral means for both caring and task-involving climates both pre- and post-intervention, the perceptions were not strong enough to elicit a change in members' behaviors. That is, the members' perceptions of the task-involved and caring climate significantly increased from pre to post intervention, yet the members' scores remained moderate at best, suggesting there is considerable room to keep enhancing the members' perceptions of the caring, task-involving climate. The finding warrants future exploration.

In addition, despite the significant increase post-intervention, the members' behaviors means are still relatively low (in between "neutral" and "slight agree") and suggest that the training provided to the staff could be reviewed or reinforced on a regular basis. It would be interesting to follow-up with members to determine whether their enhanced perceptions of behavior held over time. The fitness center relies on student employment and experiences a high turnover rate. In addition, the full time staff are not trained in sport or exercise psychology and to keep the focus of the intervention fresh and in the forefront of the staff's interactions, the on-site presence of someone trained in exercise psychology (i.e., motivational climates) is probably needed. However, the modest gains in members' and staff's behaviors suggest that training does make a difference. In addition, the fitness center staff targeted for this study valued the increases seen in behaviors and requested a manual be created to help them incorporate the principles into their regular staff meetings.

Second, the study was completed on a university campus and the campus culture among the participants may elicit a different experience when compared to individuals utilizing a fitness facility available to the general public. For example, the university fitness center draws a

younger crowd of members who are more typically in a different stage in life compared to fitness centers that draw adults who may be juggling full-time work and family responsibilities. Therefore, future research should consider using samples of varying ages, ethnicities and races to determine if unique aspects emerge that are helpful for optimizing the climate across the lifespan.

Implications for Future Research

While the current literature base provides numerous studies that support the benefits of perceiving a task-involving (e.g., Digelidis, et al., 20003; Escarti, & Gutierrez, 2001) and caring (e.g., Newton, Fry, et al., 2007; Newton, Watson, 2007) climate in physical activity settings, the antecedents to fostering these perceptions is not well explored. Furthering an understanding of specific behaviors in which staff engage and how those behaviors assist in creating a task-involving, caring climate is very relevant in the applied sport and exercise psychology field.

Researchers in exercise psychology suggest that many factors contribute to individuals' decisions to engage in exercise (Weiss & Gill, 2005). Identifying ways to encourage positive attitudes toward physical activity is important to fostering lifelong commitment (Cherubini.2009), and may include creating a caring, task-involving climate in which individuals can exercise. The current study compliments the work of Smith, et al (2005) who considered the antecedents of coaches' behaviors on motivational climates in sport settings and found specific behaviors in which coaches could engage in order to influence athletes' perceptions of the task- and ego-involving climates. Both studies offer specific behaviors individuals could engage to influence participants' experiences. Given that approximately half of the new gym members quit within six months of joining (Marcus & Forsythe, 2003), identifying ways to foster a caring, task-involving climate may be a key factor in reversing inactive behaviors.

References

American College Health Association. (2006). American College Health Association- National College Health Assessment (ACHA-NCHA) Spring 2004 Reference Group Data Report (Abridged). *Journal of American College Health, 54*(4), 201-211.

Barkoukis, V., Tsorbatzotudis, H., & Groulos, G. (2008). Manipulation of motivational climate in physical education: Effects of a seven-month intervention. *European Physical Education Review, 14*(3), 367-387. doi: 10.1177/1356336X08095671

Brown, T. A. (2006). Confirmatory factor analysis for applied research. New York: Guilford.

Brunel, P.C. (1999). Relationship between achievement goal orientations and perceived motivational climate on intrinsic motivation. *Scandinavian Journal of Medicine & Science in Sports, 9* (6), 365-374. Doi: 10.1111/j.1600-0838.1999.tb00258.x

Cherubini, J.M. (2009). Intentional Development: A model to guide lifelong physical activity. *Physical Educator, 66*(4), 197-208. Retrieved from Ebscohost.

Cheung, G.W., & Rensvold, R.B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. Structural Equation Modeling, 9(2), 233-255. doi:10.1207/S15328007SEM0902_5

Cole, D.A. & Maxwell, S.E. (2003). Testing meditational models with longitudinal data: Myths and tips in the use of structural equation modeling. Journal of Abnormal Psychology, 112, 558-577.doi:10.1037/0021-843X.112.4.558

Cothran, D., & Ennis, C. (2000). Building bridges to student engagement: Communicating respect and care for students in urban high schools. *Journal of Research and Development in Education, 33*, 106-117.

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human

behavior (2nd ed). New York: Plenum Press.

Digelidis, N., Papaioannou, A., Lapardidis, K., & Christodoulidis, T. (2003). A one-year intervention in 7th grade physical education classes aiming to change motivational climate and attitudes towards exercise. *Psychology of Sport and Exercise, 4*, 195-210. doi:10.1016/S1469-0292(02)00002-X

Duda, J. L., & Nicholls, J. G. (1992). Dimensions of Achievement Motivation in Schoolwork and Sport. *Journal of Educational Psychology, 84*(3), 290-299. Retrieved from http://csaweb115v.csa.com/

Escarti, A., & Gutierrez, M. (2001). Influence of the motivational climate in physical education on the intention to practice physical activity or sport. *European Journal of Sport Science, 1*(4), 1-13. doi: 10.1080/17461390100071406

Ferrer-Caja, E., & Weiss, M. R. (2000). Predictors of intrinsic motivation among adolescent students in physical education. *Research Quarterly for Exercise and Sport, 71*, 267-279.

Gano-Overway, L. A., Newton, M., Magyar, T. M., Fry, M. D., Kim, M. S., & Guivernau, M. R. (2009). Influence of Caring Youth Sport Contexts on Efficacy-Related Beliefs and Social Behaviors. *Developmental Psychology, 99*(9), 329-340. doi: DOI: 10.1037/a0014067

Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarification of Multiple Imputation Theory. *Prevention Science, 8*, 206-213. doi: 10.1007/s11121-007-0070-9

Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods, 3*, 424-453.

Huddleston, H., Fry, M. D. & Brown, T.C. (2011). *Corporate fitness*

members' perceptions of the environment and their intrinsic motivation. Manuscript submitted for publication.

Keating, X. D., Guan, J., Pinero, J. C., & Bridges, D. M. (2005). A meta-analysis of college students' physical activity behaviors. *Journal of American College Health, 54*(2), 116-125. doi: 10.3200/JACH.54.2.116-126

Kline, R. B. (2010). Principles and practice of structural equation modeling (3rd Ed.). New York: Guilford.

Larson, A. (2006). Student Perception of Caring Teaching in Physical Education. *Sport, Education and Society, 11*(4), 337-352.

Little, T.D. (1997). Mean and covariance structures (MACS) analyses of cross-cultural data: Practical and theoretical issues. Multivariate Behavioral Research, 32(5), 53-76. doi:10.1207/s15327906mbr3201_3

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*(2), 151-173. doi:10.1207/S15328007SEM0902_1

Lloyd, J., & Fox, K. R. (1992). Achievement goals and motivation to exercise in adolescent girls: A preliminary intervention. *British Journal of Physical Education Research Supplement, 11*, 12-26.

Magyar, T. M., Guivernau, M. R., Gano-Overway, L. A., Newton, M., Mi-Sook, K., Watson, D. L., et al. (2007). The influence of leader efficacy and emotional intelligence on personal caring in physical activity. *Journal of Teaching in Physical Education, 26*(3), 310-319.

Marcus, B. H., & Forsythe, L. H. (2003). *Motivating people to be physically active*. Champaign, IL: Human Kinetics.

Muthén, B. and Muthén, L. (2008). Mplus User's Guide. Los Angeles, CA: Muthén & Muthén.

Newton, M., Fry, M., Watson, D., Gano-Overway, L., Mi-Sook, K., Magyar, M., et al. (2007). Psychometric Properties of the Caring Climate Scale in a Physical Activity Setting. *Revisa de Psicologia del Deporte, 16*(1), 67-84.

Newton, M., Watson, D. L., Gano-Overway, L., Fry, M., Mi-Sook, K., & Magyar, M. (2007). The role of a caring-based intervention in a physical activity setting. *The Urban Review, 39*(3), 281-299. Doi: 10.1007/s11256-007-0065-7

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice and performance. *Psychological Review, 91,* 328-346.

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.

Noddings, N. (1984). *Caring: A feminine approach to ethics and moral education*. Berkeley: University of California Press.

Noddings, N. (1992). *The challenge to care in schools: An alternative approach to education.* NY: Teachers College Press.

Ommundsen, Y., Roberts, G. C., Lemyre, P. N., & Treasure, D. (2004). Perceived motivational climate in male youth soccer: Relations to social-moral functioning, sportspersonship and team norm perceptions. *Psychology of Sport and Exercise, 5,* 397-413. Retrieved from www.sciencedirect.com

R Development Core Team (2005). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL http://www.R-project.org.

Seifriz, J. J., Duda, J. L., & Chi, L. (1992). The relationship of perceived motivational

climate to intrinsic motivation and beliefs about success in basketball. *Journal of Sport and Exercise Psychology, 14,* 375-391. Retrieved from http://www.getcited.org/pub/103340448

Smith, S. L., Fry, M. D., Ethington, C. A., & Li, Y. (2005). The effect of female athletes' perceptions of their coaches' behaviors on their perceptions of the motivational climate. *Journal of Applied Sport Psychology, 17,* 170-177. Retrieved from Ebsco*host*

Standage, M., Duda, J. L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. *Journal of Educational Psychology, 95*(1), 97-110. doi: 10.1037/0022-0663.95.1.97

Standage, M., & Treasure, D. C. (2002). Relationship among achievement goal orientations and multidimensional situational motivation in physical education. *British Journal of Educational Psychology, 72,* 87-103. doi: 10.1348/000709902158784

Steiger, J. H., & Lind, J. C. (1980). Statistically based tests for the number of common factors. Paper presented at the annual meeting of the Psychometric Society, Iowa City, IA, May.

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika, 38,* 1-10.

Wallace, L., Buckworth, J., Kirby, T., & WM, S. (2000). Characteristics of exercise behavior among college students: Application of social cognitive theory to predicting stage of change. *Preventive Medicine, 31,* 494-505. doi:10.1006/pmed.2000.0736

Walling, M. D., & Duda, J. L. (1995). Goals and their associations with beliefs about success in and perceptions of the purposes of physical education. *Journal of Teaching in Physical Education, 14,* 140-156.

Weiss, M. R., & Gill, D. L. (2005). What goes around comes around: Re-emerging themes in sport and exercise psychology. *Research Quarterly for Exercise and Sport, S2*, S-71-87.

Whitehead, J., Andree, K. V., & Lee, M. J. (1997). Longitudinal interactions between dispositional and situational goals, perceived ability, and intrinsic motivation. In R. Lidor & M. Bar-Eli (Eds.), *Innovations in sport psychology: Linking theory and practice. Proceedings of the IX World Congress in Sport Psychology: Part II* (pp. 750-752). Netanya, Israel: Ministry of Education, Culture and Sport.

Table 1

Specific Behaviors of Staff

Read each statement and think about much you believe the statement describes the staff members at the Student Recreation Center (The rec). Then choose that answer that shows how much you agree or disagree with each statement.

When at the rec, the staff…

1. makes an attempt to know my name.
2. recognizes me.
3. introduces me to other members when appropriate.
4. is available when I need them.
5. has a positive attitude toward me.
6. is helpful.
7. greets me warmly when I walk in the door.
8. encourages me to try my best.
9. seems happy I use the rec.
10. encourages me to strive toward my fitness/health goals.
11. is friendly toward me.
12. makes eye contact with me.
13. notices improvements I've made.
14. loves their job.
15. wants to be working there.
16. makes me feel welcomed.
17. talks/interacts with me.

Table 2

Specific Behaviors of Members

Read each statement and think about much you believe the statement describes the staff members at the Student Recreation Center (The rec). Then choose that answer that shows how much you agree or disagree with each statement.

When at the rec, I…

1. say hello to people I recognize.
2. introduce myself to other members I do not know when given the opportunity.
3. politely wait my turn for a machine.
4. do not go over my allotted Time limit on the equipment.
5. follow rules.
6. am friendly to other members.
7. support other members' efforts.
8. do not spit in the water fountains.
9. return the weights to the proper location.
10. follow the guidelines posted for equipment usage.

Table 3

Means, sd, alpha levels and Cohen's d effect size of latent constructs, Time 1 and Time 2

	Time 1 (pre-intervention)			Time 2 (post-intervention)			Cohen's d
Construct	Mean	SD	α	Mean	SD	α	
Staff Behaviors	3.07	.59	.80	3.34	.57	.90	.49
Caring	3.92	.64	.94	4.10	.61	.85	.28
Task-involving	3.36	.60	.89	3.54	.65	.94	.29
Ego-involving	2.92	.55	.88	2.69	.69	.94	.40
Mem. Behaviors	3.07	.29	.85	3.48	.43	.90	1.08

Table 4

Fit Indices for the Pre-Post Confirmatory Factor Analysis

Model	χ^2	df	*p*	$\Delta\chi^2$	df	*p*	RMSEA	RMSEA 90% CI	SRMR	CFI	NNFI (TLI)	Tenable?
Alternative Null	25144.491	465	.000									
Configural Invariance	1299.517	345	.000				.060	.056-.063	.037	.961	.966	
Weak Invariance	1340.811	355	.000				.060	.056-.063	.038	.960	.950	Yes
Strong Invariance	1412.668	365	.000				.061	.057-.064	.039	.959	.946	Yes
Variance/ Covariance	3598.559	404	.000	257.748	49	.000						No
Variances	1416.535	360	.000	75.725	5	.000						No
Correlations	1827.009	364	.000	486.199	9	.000						No
Means	1496.265	370	.000	83.597	5	.000						No

Table 5

Loading and Intercept Values, Residuals and R^2 Values for Each Indicator, and the Estimated Latent Variance from the Strong Metric Invariance Model

	Equated Estimates		Standardized	Pre		Post	
Indicator	*Loading (SE)*	*Intercept (SE)*	*Loading*[a]	*Theta*	R^2	*Theta*	R^2
Staff Behaviors (Staff):	Estimated Latent Variance (Pre = 1.000; Post = 1.023)						
Staff1	.691(.019)	4.406(.026)	.929(.006)	.137	.863	.122	.878
Staff2	.684(.019)	4.346(.026)	.948(.005)	.101	.899	.093	.907
Staff3	.623(.018)	4.370(.026)	.913(.007)	.166	.834	.128	.872
Task-Involving (Task):	Estimated Latent Variance (Pre = 1.000; Post = 1.545)						
Task1	.550(.016)	3.408(.022)	.864(.010)	.254	.746	.124	.875
Task2	.579(.016)	3.362(.022)	.912(.008)	.168	.832	.072	.928
Task3	.621(.018)	3.312(.024)	.901(.008)	.188	.812	.119	.881
Ego-Involving (Ego):	Estimated Latent Variance (Pre = 1.000; Post = 1.707)						
Ego1	.511(.018)	2.772(.023)	.675(.017)	.544	.456	.296	.704
Ego2	.628(.019)	2.938(.024)	.895(.012)	.198	.802	.092	.908
Ego3	.620(.019)	2.992(.024)	.878(.012)	.229	.771	.125	.875
Caring (Care):	Estimated Latent Variance (Pre =1 .000; Post = 1.010)						
Care1	.600 (.017)	3.919(.023)	.941(.005)	.114	.886	.120	.880
Care2	.627 (.017)	3.909(.023)	.938(.005)	.120	.880	.094	.906
Care3	.634 (.018)	3.914(.024)	.935(.006)	.125	.875	.150	.850
Member Behaviors (Mem):	Estimated Latent Variance (Pre = 1.000; Post = .992)						
Mem1	.530(.016)	4.164(.027)	.900(.010)	.189	.811	.158	.842
Mem2	.486(.015)	4.024(.030)	.859(.012)	.263	.737	.260	.740

1	Mem3	.489 (.016)	4.055 (.030)	.790(.014)	.376	.624	.314	.6

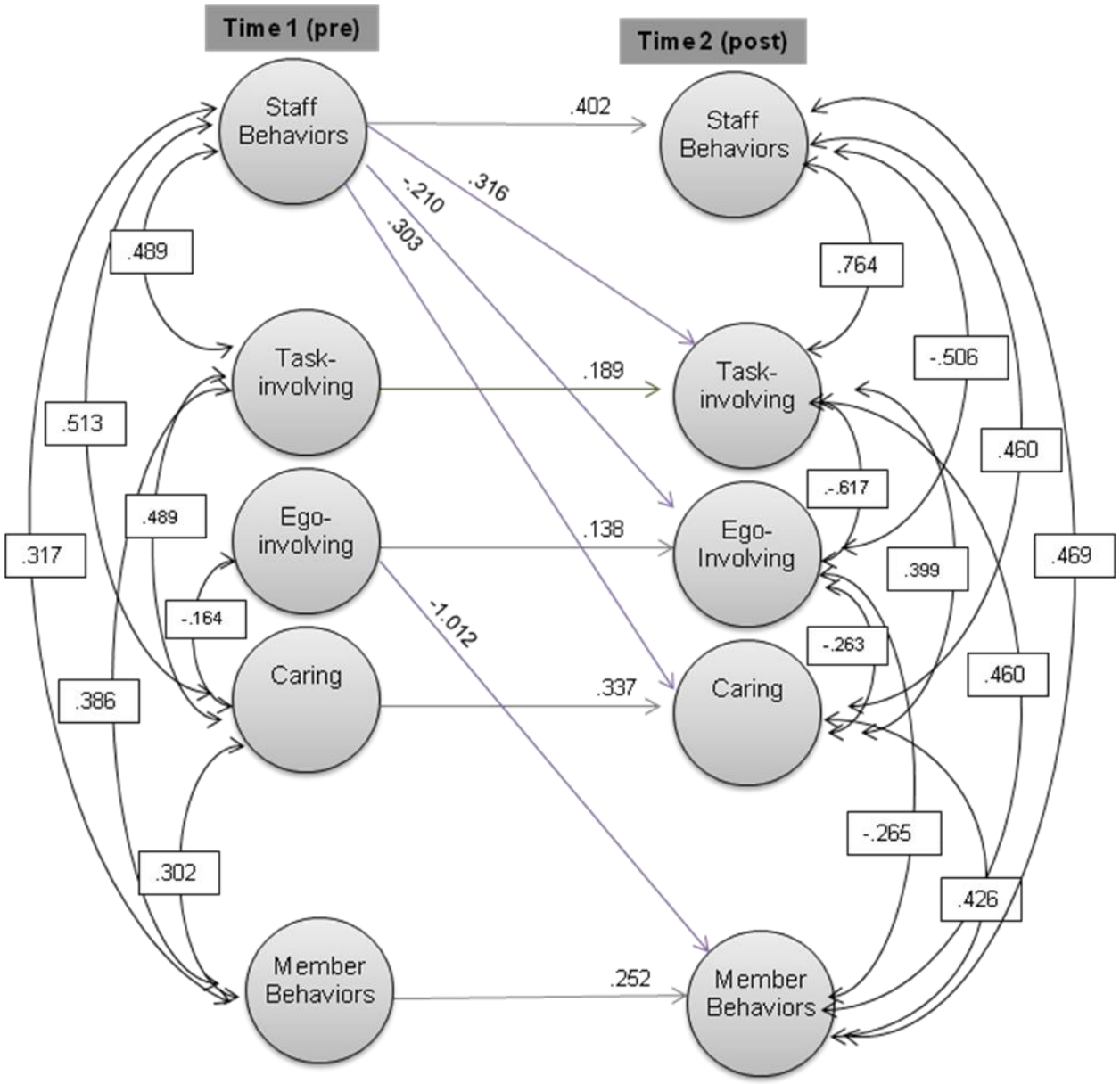
1 Figure Caption

2 *Figure 1:* ½ Longitudinal Structural Model.

3 Task involving = Task-involving Climate; Ego involving= Ego-involving Climate; Caring =

4 Caring Climate

5



APPENDIX A:

INTRODUCTION

Examining the Effects of an Intervention to Foster a Caring, Supportive Environment at a University Recreation Center

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Examining the Effects of an Intervention to Foster a Caring, Supportive Environment at a University Recreation Center

Although evidence of the benefits of regular physical activity has been widely recognized in the literature (Bouchard, Blair & Haskell, 2007), over half the population in industrialized countries worldwide do not participate in enough activity to offset the occurrence of diseases or to promote a healthy lifestyle (Sapkota, Bowles, Ham & Kohl, 2005). This trend is particularly problematic in the United States (US) where almost 40 percent of the adult population does not participate in any physical activity (NCHS, 2006). Further, only 33 percent of adults engage in 30 minutes or more of moderate physical activity at least five times a week (US Department of Health and Human Services, 2003). Given that the rate of overweight and obese individuals in the US is on the rise and that a sedentary lifestyle may limit individuals' health and lead to premature death (US Department of Health and Human Services, 2007), health organizations have encouraged research aimed at increasing physical activity among adult populations (Juan & Britten, 2008).

The benefits of physical activity are numerous. Health benefits include a reduced risk of heart disease, diabetes, obesity, metabolic syndrome and certain forms of cancer (Bouchard, Blair & Haskell, 2007). Psychological benefits include enhanced self-esteem, vitality and overall satisfaction with life (Fox, Stathi, McKenna & Davis, 2006) as well as a reduction in symptoms of stress, anxiety, depression, helplessness and sleep disorders (APA, 2004). In addition, exercise has been found to enhance mood (Steinberg, et al., 1998), memory, self-esteem, body image and subjective well-being (Hassman, Koivula & Uutela, 2000). Given these numerous benefits and potential consequences of inactivity, exercise is a viable strategy for enhancing optimal functioning and overall quality of life (Fox, 1999). Yet, a growing number of

the population continue to engage in sedentary behaviors. Unfortunately, even when individuals are motivated to begin an exercise program, the drop-out rate is high (Berger, Pargman & Weingberg, 2002) suggesting that exercise motivation is an important area of study.

Statement of the Problem

Individuals' decision to engage in exercise can be influenced by a number of environmental, social, psychological and biological factors (Biddle & Mutrie, 2001), and health professionals might purposefully address one or more of these factors to influence individuals' exercise behaviors. A number of barriers exist to increasing exercise behaviors (Schutzer & Graves, 2003), and therefore identifying ways to overcome those barriers has become an important area of inquiry. One means to influence the environmental, social and psychological reasons individuals exercise is to consider their perceptions of the climate where they engage in physical activity.

Achievement Goal Perspective Theory (AGPT; Nicholls, 1984) provides a social-cognitive theoretical framework in which to consider the motivational climate. Nicholls suggested that individuals will use either a self-referenced or other-referenced criteria for judging their own success in a given climate. In a task-involving climate, individuals perceive that everyone strives to improve and seek their personal best efforts. In addition, individuals perceive everyone is made to feel valued and welcomed and that they play an important role within the setting. Conversely, individuals perceive an ego-involving climate when participants with superior ability are recognized and attention is drawn to those who make mistakes. In this setting, individuals sense rivalry among participants, and perceive that others feel embarrassed when they do make a mistake or lack knowledge. Nicholls maintained that perceptions of a task-involving climate are more conducive to individuals' having overall more positive experiences

with the given activity. Consequently, perceptions of a task-involving climate may enhance influencing individuals' psychological well-being whereas perceptions of an ego-involving climate could be detrimental to individuals' overall experiences.

Researchers trained in AGPT have recently considered another aspect of physical activity environments that is not specifically addressed in Nicholls' work; the extent to which individuals perceive a caring climate. A caring climate is one where a safe and supportive environment fosters a sense of belonging and students feel their teachers have a genuine concern for their well-being (Magyar et al., 2007). The caring climate literature stems from the work of Nel Noddings (1984, 1992, 1995) who suggests that by focusing on a curriculum of care in educational settings, much can be gained both academically and interpersonally. Noddings' work has been applied to research by Battistich and colleagues (Battistich & Hom, 1997; Battistich, Solomon, Watson & Schaps, 1997) who have attempted to quantify students' understanding of caring behaviors in the classroom. In addition, Larson (2006) has qualitatively considered a caring climate in academic physical education settings. Researchers have found that students respond favorably to physical education teachers who engage in caring behaviors (Cothran & Ennis, 2000). When students feel cared for in physical education settings, the likelihood of them engaging in future physical activity increases (Ennis, 1999).

A final theoretical framework which addresses social factors influencing individuals' decision to engage in exercise is the needs-based Self-Determination Theory (SDT; Deci & Ryan, 1985). SDT suggests that motivation to engage or not engage in a particular activity lies on a continuum, ranging from amotivation to intrinsic motivation. Intrinsically motivated individuals engage in given activities for the inherent joys they bring, regardless of external incentives or gains. The closer individuals' exercise motivation approaches the intrinsic end of

the continuum, the more self-determined their reasons for exercise. In order to influence intrinsic motivation for exercise, three basic psychological needs must be met (i.e. autonomy, competence and relatedness). Intrinsic motivation for exercise is predicted to promote psychological well-being (Deci & Ryan, 1985, 2002; Ryan & Deci, 2000) and research has supported this theoretical tenet. Specifically, more self-determined reasons for exercise have been linked to better mental health such as physical self-worth and positive affect, whereas more controlling reasons for exercise are linked to poorer mental health (Deci & Ryan, 2002; Edmunds, Ntoumanis & Duda, 2007; Thogersen-Ntoumani & Ntoumanis, 2007). In addition, more self-determined motivation for exercise has been associated with greater exercise commitment (both actual and intended) (Brown & Fry, 2009a; Li, 1999; Ryan, Frederick, Lepes, Rubio & Sheldan, 1997; Vansteenkiste, Simons, Soenens & Lens, 2004; Wilson & Rodgers, 2004; Wilson, Rodgers, Fraser & Murray, 2004). Unfortunately, most individuals are not intrinsically motivated to exercise (Ryan, et al., 1997), so identifying means to influence individuals' degree of self-determination for exercise is an important area of inquiry. Well-being is characterized by experiencing more positive than negative affect in both (1) any given moment relative to a baseline (i.e., state) and (2) overall life experiences (i.e., trait).

Well-being in SDT research related to sport and exercise has generally been inferred from instruments measuring constructs such as positive and negative affect, anxiety, depression, life satisfaction, subjective vitality, self-esteem and psychosomatic symptoms (see Ryan & Deci, 2001, for a review). Exercise can influence both state and trait well-being (Wilson & Rodgers, 2005). For example, individuals have reported higher positive affect at the conclusion of a single exercise session (Blancard, Rodgers & Galvin, 2003) and regular exercisers have been rated with a "positive stereotype" compared to non-exercisers (Martin-Ginis, Latimer & Jung, 2003).

Physical activity has the potential to foster positive changes in quality of life, vitality and self-esteem (Ryan & Deci, 2001; Fox, 1997). However, variables that mediate the exercise and psychological well-being connection are not well understood.

Perceptions of the motivational climate may influence the connection between exercise and overall quality of life. Previous research has found an association between perceptions of a caring and task-involving exercise climate to more intrinsic exercise motivation as well as enhanced physical self-concept, hope and happiness in life (Brown & Fry, 2009b). Likewise, research has linked more self-determined reasons for exercise with more positive affect, increased physical activity and higher physical self-worth (Vlachopoulos, Karageorghis & Terry, 2000; Wilson & Rodgers, 2002). This line of research suggests that the motivational climate may influence overall psychological well-being. However, research specifically targeting motivational climates in exercise settings is limited. Likewise, most studies are descriptive in nature and longitudinal research is needed to determine the predictive relationship between perceptions of the motivational climate and psychological outcomes.

Young adults may be an ideal target population for longitudinal data collection on health behaviors as the college years are a pivotal time to increase exercise commitment. Studies have shown that individuals who adopt an active lifestyle during their college years tend to continue their physical activity program post graduation (Adams & Brynsteson, 1992; Sparling & Snow, 2002). Unfortunately, physical inactivity has been identified as a major health risk behavior for college students (American College Health Association, 2002). Health professionals have advocated for researchers to identify ways to increase physical activity among otherwise sedentary college students (Keating, Guan, Pinero, & Bridges, 2005; Wallace, Buckworth, Kirby

& Sherman, 2000). Increasing exercise interest during the college years may foster a lifelong commitment to physical activity.

Given the proportion of the population that is currently sedentary, identifying ways to increase individuals' interest and commitment in regular physical activity is needed across the nation. One of the goals of Healthy People 2020 is to improve health, fitness, and quality of life through daily physical activity, with a specific objective of increasing the proportion of adults who engage in moderate physical activity at least 30 minutes per day (Healthy People 2020 & NCHS, 2001). Physical activity enhances quality of life (LaCroix, et al, 1993; Nelson, et al., 1994) and longevity (Kujala, et al., 1998). If perceptions of a caring and task-involving environment in physical activity settings increase commitment to engage in future exercise (Brown & Fry, 2009a), then attention to supportive interventions may contribute to the realization of the Healthy People goals.

Study Design

The focus of the present study is to examine the relationship of participants' perceptions of the environment in an exercise setting to their intrinsic motivation, commitment to exercise, positive and negative mood states, body image and life satisfaction. In order to accomplish this goal, an intervention has been designed to promote a positive, caring and supportive environment in the Amber Student Recreation Fitness Center (ASRFC) at the University of Kansas, The ASRFC is an ideal setting for the intervention to take place as the state-of-the-art facility accommodates a range of fitness abilities, offering a variety of equipment, team and individual sports, classes and personal training all designed to promote physical activity among the campus community. The recreation center's mission is to push students' physical abilities to their next level, because "motion engages the body and soul" (KU Recreation Services, n.d.). However,

the recreation center has a small full-time staff (seven individuals relating to fitness/recreation pursuits) and while the staff's background in recreation administration and exercise science is extensive, they do not currently have a staff member with exercise psychology expertise.

Further, over 150 student employees are utilized to help with day-to-day functioning who bring with them varying degrees of interest in and knowledge of health and fitness. At times, the full-time staff perceives a lack of enthusiasm and ownership from the student staff. They have voiced that the student staff often lacks a "passion" for making the recreation center a welcoming and supportive environment. The goal is for the full-time staff to feel they have the resources and understanding of how to work with their student staff population to cultivate a positive motivational climate where effort and improvement are emphasized over perceived ability.

In order to enhance a positive, supportive and caring environment in this fitness center, an intervention will be delivered that will provide training to the fitness center's staff on how to foster a setting that emphasizes individual students' effort, improvement and positive interaction among campus constituents. Assessment will occur via questionnaires (pre & post-intervention) with students who use the Student Recreation Center. The questionnaires will include measures of the following: a) climate (e.g. perceptions of the caring, task-, and ego-involving climates), b) psychological needs (e.g. autonomy, competence, and relatedness), c) motivational responses (e.g. extrinsic and intrinsic motivation), d) commitment to exercise and e) psychological well-being (e.g. satisfaction with life, positive and negative mood states and satisfaction-dissatisfaction with body image).

Research Hypotheses

The research questions and hypotheses will be presented in three different papers, each targeting a different aspect of the overall study design. Below are the descriptions of each paper, presented as Study 1, Study 2 and Study 3.

Study 1: The Psychometric Properties of the Perceived Motivational Climate in Exercise Questionnaire

Given the potential benefits of understanding how the climate may influence individuals' motivational outcomes, there exists a need for instrumentation measuring exercise setting climates. Previous instrumentation targeting perceived motivational climates were created to measure athletes' perceptions of their team environment (Newton, Duda & Yin, 2000; Walling, Duda & Chi, 1992) and thus, are not completely applicable to voluntary exercise settings such as a campus fitness facility.

Therefore, the purpose of Study 1 is to validate the psychometric properties of a newly created instrument, known as the Perceived Motivational Climate in Exercise Settings (PMCEQ; Huddleston, Fry & Brown, 2011), designed to assess motivational climates in exercise settings. Using confirmatory factor analysis, both the factor structure and concurrent validity and reliability of the PMCEQ will be explored to validate the measure. In addition, students' perceptions of the motivational climate will be examined in relation to their positive (i.e., vigor, well being, calm, self-assurance, attentiveness) and negative (i.e., depression, anxiety, hostility, fatigue, fearful) mood states. It is hypothesized that perceptions of a high task-involving climate will be positively associated with a caring climate and positive mood states. Perceptions of an ego-involving climate are expected to be negatively associated with a caring climate. In addition, ego-involving climates are expected to be positively associated with negative mood states. Only pre-survey measures will be utilized for Study 1.

Study 2: Integrating Achievement Goal Perspective Theory and Self-Determination Theory to Predict Students' Commitment to Exercise and Psychological Well-Being

Both AGPT and SDT offer insight into individuals' exercise behaviors and subsequent outcomes. For example, previous research has found a link between perceptions of positive exercise climates and more intrinsic exercise motivation (Brown & Fry, 2009a; Parish & Treasure, 2003). Likewise, research has linked more self-determined reasons for exercise with higher positive affect, increased physical activity and higher physical self-worth (Vlachopoulos, Karageorghis & Terry, 2000; Wilson & Rodgers, 2002). Researchers have advocated for more empirical research to advance an understanding of how AGPT and SDT relate to exercise settings (Biddle, Soos & Chatzirantis, 1999). However, to date, few studies have attempted to integrate both theories. Likewise, most studies are descriptive in nature and half longitudinal research designs are needed to determine the predictive relationship between perceptions of the motivational climate and psychological outcomes.

Researchers have suggested that integrating AGPT and SDT may enhance the success of exercise interventions (Rawsthorne & Elliot, 1999; Wang & Biddle, 2007). Exploring the relationships between the constructs of the two theories may reveal ways in which the motivational climate may foster, or hinder, self-determined exercise motivation (Ntoumanis, 2001). Therefore, the purpose of Study 2 is to (a) test a model examining whether psychological needs mediate the relationship between exercise participants' perceptions of the climate to their self-determined motivation and (b) test whether self-determined motivation for exercise predicts the basic psychological needs and commitment to exercise, body image and satisfaction with life.

Based on theoretical tenets (Deci & Ryan, 1985; Nicholls, 1984; Vallerand, 1997, 2001) and empirical evidence (Cox & Williams, 2008; Standage, Duda & Ntoumanis, 2003; Wilson &

Rodgers, 2002), it is hypothesized that, (a) perceptions of the climate at Time 1 will predict scores on the basic psychological needs (i.e. autonomy, competence, relatedness) at Time 2, (b) basic psychological needs at Time 1 will predict level of self-determined motivation (i.e. extrinsic, intrinsic) at Time 2, and (c) self-determined motivation at time 1 will predict commitment to exercise, satisfaction with life and body image at time 2. See Appendix B for a visual presentation of the proposed model. In order to test the proposed model, Structural Equation Modeling will be utilized. Both pre and post data from members will be used so that the change from Time 1 to Time 2 can be taken into account (see Appendix C for the mediation model).

Study 3: Examining the Effects of an Intervention with Recreation Center Staff to Foster a Caring, Task-Involving Climate

Few research studies have considered the overall effect of a caring, task-involving climate on motivational outcomes in exercise settings. The limited research that does exist suggests that perceptions of a high caring, task-involving climate are associated with more adaptive motivational responses such as higher commitment to future exercise and greater enjoyment of exercise (Brown & Fry, 2009a). However, from an applied point-of-view, little is known about the behaviors individuals engage in to create a caring, task-involving climate and what effect perceptions of the climate have on members' specific behaviors.

Thus, Study 3 will assess the relationship between perceptions of staff behaviors and members' behaviors in a recreation center facility. Perceptions of a caring, task-involving climate will be examined as the mediator between staffs' and members' behaviors. The staff's and members' behaviors will be considered from the members' perspective. It is hypothesized that (a) staff's behaviors at Time 1 would predict perceptions of the climate at Time 2 and (b)

perceptions of the climate Time 1 would predict member's behaviors at Time 2. A repeated measure design will be employed to determine whether differences exist between Time 1 (i.e. pre-intervention) and Time 2 (i.e. post-intervention) data (see Appendix D for the model).

Significance of the Dissertation Research

This study will add to the growing body of literature examining the effects of a caring, task-involving climate on individuals' adaptive motivational responses and psychological well-being. To date, no studies have been conducted to examine the impact of an intervention tailored specifically to a university fitness center to foster a caring, supportive environment. In addition, this study will help examine the potential mediators involved in exercise behaviors and psychological well-being. Finally, this study will attempt to integrate two well-known theories in exercise motivation, AGPT and SDT, which is currently lacking in the sport and exercise psychology field. According to Rawsthorne and Elliot (1999), research incorporating the two theories is "an issue of great applied importance in that it has direct implications for educational, occupational, and sport settings" (p.326). Few empirical studies of this nature have been conducted, but the relevance has great potential for influencing exercise behaviors.

Limitations

A main limitation to this design is a result of the targeted participant pool. Specifically, this half-longitudinal study will rely on individuals completing both pre and post measures. Post measure follow-up may prove challenging. In order to encourage compliance, an incentive will be offered both pre (i.e., granola bar) and post (i.e., water bottle) data collection to entice participants to complete the research questionnaires. In addition, the participant population is limited to individuals choosing to visit the fitness center which happens to be located on a large, research-focused institution of higher education. Therefore, results should not be generalized to

all adult populations. Also, while particular types of individuals may choose to belong to the fitness center, the pre data will be collected in January. This time frame for data collection may reach new members to the fitness center, choosing to attend as a result of New Years' resolutions revolving around fitness goals.

Finally, the success of the intervention relies on the compliance of the fitness center staff. Since the staff's daily interactions and activities while on the job cannot be constantly and consistently monitored, their enthusiasm for their responsibilities and commitment to the students who use the facility are imperative to ensure the intervention is properly implemented. The full-time staff at the fitness center has unanimously supported this study and sees value in the intervention for both their employees and facility. Therefore, their endorsement may positively influence the entire staff to embrace the intervention.

Definition of Terms

Autonomy: Within the SDT framework, individuals' beliefs that they are the originator of their actions (Deci & Ryan, 1985).

Body Image*:* Individuals' awareness and perceptions of their own physical appearance (Blakeslee,2006).

Caring Climate*:* A setting where a safe and supportive environment fosters a sense of belonging and participants feel their teachers/leaders have a genuine concern for their well-being (Magyar et al., 2007).

Commitment to Exercise*:* The sincere sense of purpose to act or pursue a particular course of physical activity (Marriam-Webster, 2009)

Competence: Within the SDT framework, individuals' need to demonstrate proficiency

in their chosen activity or movement (Deci, 1975). The need for competence drives individuals to seek challenging activities in order to demonstrate their proficiency (Deci & Ryan, 2002).

Ego-involving Climate: An achievement setting stressing normative standards of performance as indicators of effort and ability (Ames, 1992; Nicholls, 1989).

Exercise: Any physically related activities that individuals have a choice in pursuing; in other words, the activities are not mandatory for the individual (Gillison, Standage & Skevington, 2006).

Extrinsic Motivation*:* Motivating factors compelling individuals to act are outside the self. Deci and Ryan (1985) have suggested that motivation lies on a continuum, with amotivation on one end of the spectrum to intrinsic motivation on the other. Varying degrees of self-determined motivation is found along the continuum, including external, introjected, identified and integrated motivation.

Intrinsic Motivation*:* Motivation that comes from the inherent pleasure of the task itself rather than an outside source of reward or punishment (Deci & Ryan, 1985).

Life Satisfaction*:* Contentment and liking of one's overall life (Diener, Emmons & Larsen, 1985).

Negative Affect: A general dimension of distress and unpleasurable mood. High negative affect is characterized by anger, fear and anxiety whereas low negative affect is characterized by calmness (Watson, Clark & Tellegen, 1998). For the purposes of this study, negative affect will be measured using the following scales from the Profile of Mood States (Usala & Hertzog, 1989): depression, anxiety, hostility, fatigue and fearful.

Positive Affect: The extent to which an individual can feel excited, lively and attentive.

High positive affect is characterized by high energy and enthusiasm whereas low positive affect is characterized by lethargy and unhappiness (Watson, Clark & Tellegen, 1988). For the purposes of this study, positive affect will be measured using the following scales from the Profile of Mood States (Usala & Hertzog, 1989): vigor, well being and calm. In addition, the self-assurance and attentiveness scales from the Positive and Negative Affect Scales (Watson & Clark, 1994) were included.

Relatedness*:* Within the SDT framework, the need to be secure in a group and to feel valued and cared for by the group (Baumeister & Leary, 1995).

Task-Involving Climate: An achievement setting where personal effort and improvement is emphasized over normative comparison (Ames, 1992; Nicholls, 1989).

Well-Being*:* An individual's psychological growth and ability to function optimally in any given setting (Ryan & Deci, 2001); considered a necessary component of positive psychological health (Diener, Suh, Lucas & Smith,1999).

APPENDIX B:

EXTENDED LITERATURE REVIEW

Extended Literature Review

To understand why individuals choose to engage, disengage or not engage in a particular activity, theorists often turn to the concept of motivation. Originally, motivation in physical activity was thought to be a behavioral response related to phenomena that occurred outside of an individuals' consciousness (Locke & Latham, 2002). However, psychological theorists broadened the view of motivation from a behavioral perspective that mainly focused on physiological needs (e.g. thirst, hunger) to a cognitive approach that focuses on psychological needs (e.g. competence, conscious goals) (Ryan, 1970; Deci & Ryan, 1985; Harter, 1980). Psychologists contend, for example, that motivation is an important construct influencing individuals' decisions to engage in physical activity or choose a more sedentary lifestyle (Hagger & Chatzisarantis, 2007).

Self-Determination Theory (SDT; Deci & Ryan, 1985) has recently received attention in the exercise domain to help understand motivational processes and psychological well-being with regard to exercise behaviors (e.g. Edmunds, Ntoumanis & Duda, 2006; Thogersen-Ntoumani & Ntoumanis, 2006, 2007; Wilson & Rodgers, 2004; Wilson, Rodgers, Fraser & Murray, 2004). One basic underlying assumption of SDT is that the particular social context of a situation determines the level of satisfaction of basic psychological needs. This in turn influences individuals' levels of self-determined motivation to exercise, which have been proposed to impact psychological well-being (Ryan & Deci, 2000; Sheldon, Elliot, Kim & Kasser, 2001). SDT provides an organismic view of motivation, suggesting that the environment alone does not cause motivational outcomes. Rather, how individuals perceive and process the environment influences their experiences, and therefore, environments can be

structured to either hinder or nurture the fulfillment of individuals' basic psychological needs. This has implications for applied interventions in physical activity settings.

While SDT offers an appealing framework to apply to exercise contexts, few studies have considered what specific mechanisms and behaviors in exercise environments may lead to the satisfaction of the basic psychological needs and thus more self-determined reasons for exercise. In other words, what specific behaviors could exercise leaders engage in so that their members may experience more positive outcomes to their psychological well-being? Previous research has suggested some ways exercise leaders might enhance intrinsic motivation such as offering a choice in activity, minimizing external pressure, demonstrating empathy, providing technical instruction and supplying optimal challenges (Deci, Koestner & Ryan, 1999; Ryan & Deci, 2000). While these strategies may be beneficial, it seems both the Achievement Goal Perspective Theory (Nicholls, 1984) and Caring Climate framework (Magyar, et al., 2007) are appropriate constructs for examining individuals' perceptions of the exercise environment and their subsequent motivational outcomes. In the following sections, each theoretical framework will be outlined individually, with attention given to each framework's potential contribution to understanding exercise motivation. The overview of each framework will be followed by an explanation of instrument creation. Then, the contributions of each framework will be synthesized in order to add to the knowledge-base concerning exercise motivation and the potential outcomes on individual health and well-being. Examination of these frameworks is an important area of inquiry as researchers have suggested an integration of AGPT and SDT may enhance the success of exercise interventions (Wang & Biddle, 2007).

Achievement Goal Perspective Theory

Achievement Goal Perspective Theory (AGPT; Nicholls, 1984, 1989) has been identified as an important social cognitive framework to understand how to foster individuals' motivation to engage in physical activity. Research employing AGPT has been conducted in classroom (e.g. Ames, 1992; Ames & Archer, 1988), sport (e.g. Duda, et al., 1995; Gano-Overway, et al., 2003; Siefriz, Duda & Chi, 1992) and physical education settings (e.g. Goudas, Biddle & Fox, 1994; Standage & Treasure, 2002) to explain the reasons that individuals pursue particular goals and what cognitive components influence their pursuit (Ames, 1992; Nicholls, 1989). Goals are necessary in physical activity settings because they serve as the forces that propel individuals to take particular action (Elliot & Dweck, 1988).

According to Nicholls, an individual adopts a goal perspective in a particular setting based on three important factors: 1) the individual's dispositional goal orientations, 2), the motivational climate of the particular setting and 3) the individual's cognitive developmental level. Goal perspectives refer to whether individuals are task or ego-involved at a particular moment in time. When individuals are task-involved, they are focused on their effort and improvement as markers of success. In contrast, when individuals are ego-involved, they are focused on their normative standing as the primary indicator of success. Goal perspectives are critical because they predict individuals' thoughts, feelings and behaviors in achievement settings. The major component underlying AGPT is that individuals have a natural drive to demonstrate competence at a given task, but competence can be construed in two ways.

Individuals' dispositional goal orientations are defined as their personal definitions of success. Individuals high in task orientation define success based on their effort and improvement. However, individuals high in ego orientation use normative comparison to define success, and only feel successful when they have outperformed others or performed equally with

less effort. According to Nicholls, individuals can be high and/or low in both task and ego orientation.

Nicholls believed that children are naturally task oriented until they develop a mature understanding of ability, which usually occurs around 12 years of age (Nicholls, 1978, 1989). When a mature understanding of ability is realized, children are able to distinguish effort from ability, luck from ability and normative versus objective task difficulty (Fry & Duda, 1997; Fry, 2000a; Fry, 2000b). At this time, youngsters are capable of adopting a high ego orientation, which requires their understanding that effort a) helps individuals maximize their performance and b) their performance at this time is limited by their current ability level. Prior to acquiring a mature understanding of ability, children are more inclined to expect that high effort could lead to the demonstration of high performance, even when ability levels vary greatly. In fact, young children identify effort as the major influence on performance (Fry & Duda, 1997). Nicholls argued that a high task orientation is preferable because it helps youngsters focus on their effort and improvement as markers of success, and these are aspects of performance they have more control over.

Research has revealed that in addition to goal orientations, individuals' goal perspectives are influenced by the motivational climate they perceive in achievement settings (Dweck & Leggert, 1988). According to Nicholls, motivational climates can be perceived as either task- or ego-involving. When individuals perceive highly task-involving climates three characteristics are evident: the coach/teacher recognizes participants for their high effort and improvement, they do all they can to foster cooperation among participants, and everyone is made to feel that they play an important role on the team/in the group. Individuals' motivational responses are more likely to be optimized when they perceive a task-involving climate because they are more likely to

attribute their successes to the amount of effort they put forth and improvements they achieved rather than their inherent ability.

In contrast, very different characteristics describe an ego-involving climate. In ego-involving climates the coach/leader provides limited recognition and only those with high ability and/or exceptional performances receive positive feedback. In addition, the coach/leader fosters team rivalry and is more likely to punish participants when they make mistakes. Perceptions of an ego-involving climate, where performance outcome and normative comparison are the focus, are problematic in fostering positive experiences for individuals in achievement settings. Individuals' focus often becomes centered on the ability of those around them rather than their personal progress. They are more likely to attribute their successes in physical activity to their abilities and measure their achievements based on the performance of those around them.

Nicholls' Achievement Goal Perspective Theory has received considerable attention in both the pedagogy and sport psychology literature and has revealed consistently the benefits of teachers and coaches creating a task-involving climate (e.g. Biddle, Soos & Chatzisarantis, 1999; Miller, Roberts & Ommundsen, 2004; Papaioannou, Marsh & Theodorakis, 2004; Pensgaard & Roberts, 2002). In the education domain, Ames and Archer (1988) considered the motivational climate in junior high and high school settings. The researchers found that children in high task-involving climates (termed mastery-climates) reported higher enjoyment, effort, perseverance and acceptance of challenging tasks compared to those in high ego-involving climates (termed performance-climates), regardless of the children's perceived ability. The researchers concluded that regardless of children's personal perceived ability, their performance was enhanced by a task-involving climate. This study suggests that, rather than accentuate children's abilities,

teachers do well to focus attention on creating a supportive atmosphere where personal goals are encouraged and personal effort and improvement are emphasized.

In addition to the pedagogical domain, Nicholls' theoretical tenets are applicable to physical activity settings. For example, the motivational climate may predict athletes' attitudes towards their given sport, with task-involving climates enhancing their experience and ego-involving climates driving them further from participation (Fry & Newton, 2003). These are important implications for coaches and teams to consider. While perceptions of a task-involving climate are positively associated with higher perceived competence, showing persistence when faced with a difficult task, and more enjoyment and interest in the activity (Duda & Nichols, 1992; Ommundsen, Roberts, Lemyre, & Treasure, 2004; Solomon, 1996; Walling & Duda, 1995), perceptions of an ego-involving climate have revealed less desirable effects on individuals' perceived competence and interest in the activity. Research has found a positive association between ego-involving climates and avoidance of challenging tasks, exertion of less effort when perceived ability is low, and higher levels of extrinsic motivation for participating (Standage & Treasure, 2002; Wang & Biddle, 2001; Whitehead, Andree & Lee, 2004). Interestingly, the leaders involved in the activity are also influenced by the motivational climate. Solmon (1996) found that the teachers who manipulated the physical education class environment benefited more from a task-involving climate, as they reported greater enjoyment of working with the students and less stress than in the ego-involving climate.

Given that task-involving climates are associated with more positive responses and ego-involving climates are associated with less desirable responses in both physical education and on sports teams, it seems likely that a similar association would be evident in other physical activity settings such as exercise. However, limited research has examined exercise participants'

perceptions of the motivational climate operating in their physical activity classes and in their health clubs.

Instrument Development: AGPT

In order to determine the importance of task-involving climates in the sports domain, Seifriz, Duda and Chi (1992) developed a 21-item sport-specific measure known as the Perceived Motivational Climate in Sport Questionnaire (PMCSQ). The purpose of the questionnaire was to capture the prominent motivational climate created by coaches. Similar to the research in educational settings in this initial study, the PMCSQ was used to assess the climate operating in adolescent male basketball teams. The authors created a pool of 106 items, which was reduced to 40 items by a panel judging face validity. The exploratory factor analysis revealed a final version of two factors with a total of 21 items, nine representing task- and twelve representing an ego-involving climate, respectively. Both factors were shown to have satisfactory internal consistency (all reliability coefficients >.80). The basketball players who perceived a higher task-involving climate on their teams were more likely to report greater enjoyment and identify effort as a primary cause of success. Those who perceived an ego-involving climate were more likely to identify personal ability as a primary cause of success.

Walling, Duda and Chi (1993) attempted to establish construct validity of the PMCSQ through confirmatory factor analysis. Their results revealed an acceptable fit of the data to the two factor model. The two factors were not independent of one another, however, and a considerable amount of unexplained variance was found among the observed variables, indicating potential for further improvement of the model. In addition to construct validity, a second purpose of the study was to establish predictive validity by determining the relationship of the motivational climate to young athletes' (i.e. in a variety of sports) performance-related

worries and satisfaction with team membership. Results indicated that athletes who perceived a task-involving climate were more likely to experience lower levels of performance worry and greater satisfaction with their team participation. Those who perceived an ego-involving climate experienced greater performance worry and less satisfaction with team membership.

Newton, Duda and Yin (2000) developed the PMCSQ-2, an expanded version of the PMCSQ that included subscales of the task- and ego-involving scales, respectively. The proposed 42-item questionnaire was administered to 201 female athletes participating in basketball and volleyball tournaments. The exploratory factor analysis resulted in a 31-item instrument. The results suggested a total of 6 factors, with the items representing subscales within the larger task-involving (effort/improvement, important role, and cooperative learning) and ego-involving (unequal recognition, punishment for mistakes and intra-team member rivalry) climate scales. The measure was further supported by the researchers in a confirmatory factor analysis with female volleyball players. For the confirmatory factor analysis, two items were added to the cooperative learning subscale resulting in a 33-item questionnaire ("On this team, the players really 'work together' as a team" and "On this team, the players help each other to get better and excel"). The researchers found support for the 33-item version. Specifically, evidence suggested that the subscales had been correctly assigned to the higher-order factors, and that a hierarchical model was a better fit of the data than a six-factor non-hierarchical model or the two-scale model PMCSQ originally proposed. The resulting PMCSQ-2 33-item instrument is regarded as a beneficial tool that has been used in the sport psychology literature to evaluate the motivational climate of sport settings (e.g. Gano-Overway, et al, 2003; Smith, Fry, Ethington & Li, 2005; Treasure & Roberts, 2001; Vazou, Ntoumanis & Duda, 2006).

A potential hurdle to research in the exercise domain is that a suitable instrument to measure climate in exercise settings has not yet been validated. Huddleston, Fry and Brown (2011) adapted the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2) to make it applicable to a corporate fitness facility. While some of the items on the PMCSQ-2 were relevant in the exercise domain, other items were not specific to sport and therefore not applicable. Huddleston, et al. then slightly adapted some items, deleted others and developed new items that tapped into the perceived climate relevant to corporate fitness settings. For example, the researchers changed the "everyone plays an important role" scale to "everyone feels valued/welcome". Items in the latter scale were more applicable to an exercise setting .They revised the "punished for mistakes" items to reflect "feeling conscious/embarrassed" as that seemed more fitting for corporate fitness.

After revisions were made, Huddleston, et al., reported support for the measure that included task-involving (i.e. cooperation; valued/welcome; effort- improvement) and ego-involving (i.e., unequal recognition; consciousness/embarrassment; intra member rivalry) items. The factorial validity of the Valued by Employer Scale was analyzed through CFA, hypothesizing each variable would load as a single indicator on one factor (i.e., value). The final established validity for a 29-item measure. In addition, the researchers found that when members perceived a more task-involving environment in their corporate fitness facility, they were more likely to report higher intrinsic motivation with regard to exercise, and to feel more valued by their employer. Huddleston, et al.'s findings revealed that it was not enough for employers to simply provide a fitness center for their employees; the key to influencing exercise motivation was in the employees perceiving a positive and supportive environment that helped them internalize their desire to exercise and feel more valued by their employer.

The PMCEQ has been used in recent research evaluating the motivational climate in group exercise settings. Cronbach alpha coefficients have been consistently high for both the task-involving (.91) and ego-involving (.91) scales (Brown & Fry, 2009a; Moore & Fry, 2009). It should be noted, however, that while the factorial validity was established by Huddleston, et al. (2011), the sample size was not efficient to complete a multi-group comparison and therefore more research is needed to establish weak and strong invariance across groups.

Caring Climate

Recently, researchers have considered another aspect of physical activity environments, the extent to which individuals perceive a caring climate. Nel Noddings, an educational philosopher (1984, 1992, 1995), has written extensively regarding the ethic of care in educational settings. Stating that the notion of caring is a fundamental part of human life, Noddings contends that much can be gained both academically and interpersonally, by focusing on a curriculum of care in the educational domain (Noddings, 1995) She has suggested that fundamentally, caring requires two individuals in the relationship, termed the care-giver and care-receiver. Without a relationship between the two entities, the motivation and intentions of those involved cannot be understood.

In order to truly be involved in a caring relationship, Noddings believes that both the care-giver and care-receiver play a role. Four dimensions of caring are important for both parties:1) those involved in the relationship must receive one another in a non-biased manner; 2) the care-giver must be nonjudgmental; 3) priority is given to the care-receiver; and 4) those involved give complete attention and empathetic concern to the other. Both the care-giver and care-receiver must be fully engaged and open to receiving the other (Noddings, 1984, 1992,

1995). Noddings' philosophical writings lay the groundwork to provide meaning and importance to the concept of caring in educational environments.

A caring climate has been described as one where a safe and supportive environment fosters a sense of belonging and where students feel their teachers have a genuine concern for their well-being (Magyar et al., 2007). Researchers interested in Noddings' concept of caring have attempted to apply her philosophy in their work. For example, the work of Battistich and colleagues (Battistich & Hom, 1997; Battistich, Solomon, Watson & Schaps, 1997) has focused on measures that quantify students' sense of community in educational settings, which taps into caring themes. In addition, Larson (2006) has begun to explore a caring climate in academic physical education settings.

Larson found that students in physical education classes felt cared for when they were recognized, respected and their learning was facilitated. Similarly, researchers have found that students respond favorably to physical education teachers who engage in caring behaviors (Cothran & Ennis, 2000). When students feel cared for in physical education settings, their likelihood of engaging in future physical activity is likely to be enhanced (Ennis, 1999).

Recently, the effectiveness of a caring climate intervention has been considered in youth sport participation. Newton, Watson, et al (2007) compared a caring-based climate to a traditional-based climate in a summer youth sport camp serving multiethnic, under-served youth. They found that those in the caring program had higher empathetic concern for other campers, expressed greater desire for future participation and reported lower perceptions of an ego-involving climate.

Although there was no significant difference found in the enjoyment levels of the campers in the caring-based versus traditional-based programs, the researchers suggested that

these results may be specific to the particular population served. Given that the youth came from low socioeconomic status backgrounds, the experience of spending 5 weeks on a college campus participating in a variety of sports was probably enjoyable regardless of whether they were in the caring or traditional groups, respectively. In fact, the mean score on enjoyment for both the caring group (4.36) and traditional group (4.10) were high (on a 1-5 Likert scale). Despite the findings regarding enjoyment, however, the study offers preliminary data to suggest that intentional efforts to create a caring environment in sport have resulted in important benefits for youngsters.

Expanding on their initial work, researchers have recently considered potential mediating variables of a caring climate on positive youth development. In a study on youth involved in a summer sport camp, the researchers found that when youngsters perceive a caring environment, they perceived they were better able to regulate both their positive and negative emotions. Youth who perceived they could regulate their positive emotions also reported expressing more empathy for others and engaging in fewer antisocial behaviors. Youth who perceived they were equipped to manage their positive emotions also reported fewer antisocial behaviors (Gano-Overway, Newton, Magyar, Fry, Kim & Guivernau, 2009). These findings have implications for the role of a caring environment in influencing individuals' abilities to function effectively in society.

While research has found that the creation of a caring environment in physical activity settings influence future commitment to physical activity among youth (Papaioannou, 1995), no studies have presently examined the potential benefits of creating a caring environment in group exercise settings with adults. However, given the similarities between the type of activities

performed and intended goals of sport and physical education with exercise settings, further inquiry regarding the caring climate is warranted.

Instrumentation Development: Caring Climate

The researchers who developed the Caring Climate Scale (CCS) all had a background in Achievement Motivation Theory and had conducted research examining the motivational climate in sport and physical education settings (Newton, Fry, Watson, Gano-Overway, Kim, Magyar & Guivernau; 2007). Over time, they began to perceive that Nicholls' conceptualization of the climate and sport psychology researchers development of an instrument to measure the motivational climate in physical activity contexts was missing an important component that tapped the psychosocial aspect of caring. While they agreed that the task-involving characteristics focusing on effort and improvement, and cooperation are critical for setting the stage to maximize motivation, they also felt that having an atmosphere where leaders and participants treat one another with mutual respect and kindness was equally important, yet not captured in the current climate measures.

In the initial study describing the development of the CCS, the researchers expected a positive association between the caring and task-involving climate scales (Newton, Fry et al., 2007). If individuals perceive they are in an environment where their effort and improvement are valued and rewarded, it would seem to follow that they would be more likely to perceive a sense of caring in that environment. Their results revealed a significant moderate correlation (i.e., r=.56), indicating that the two scales were positively associated, yet assessing unique aspects of the environment. Of further interest was the mean score of the caring and task-involving climates. Newton, et al. reported similar means for the CCS and task-involving scales (i.e. 3.80 and 3.98, respectively). The resulting confirmatory factor analysis revealed support for a 13-item

version of the CCS that is distinct from the PMCSQ-2. Other studies have confirmed high Cronbach alpha coefficients for the measure (Brown & Fry, 2009a; Gano-Overway, et al., 2009; Moore & Fry, 2009).

Self-Determination Theory

Another theoretical concept that considers why individuals are motivated to exercise is Self-Determination Theory (SDT; Deci & Ryan, 1985; 1991). SDT provides a framework that considers the socio-contextual and psychological facts that influence whether individuals participate in physical activity, as well as the impact of those perceptions on concepts such as motivation, behavior and psychosocial outcomes. SDT suggests that motivation is a multi-dimensional concept that varies in degree of self-determination, which can be further understood by examining the Organismic Integration Theory (OIT; Deci & Ryan, 1985; Ryan & Connell, 1989) and Cognitive Evaluation Theory (CET; Deci & Ryan, 1985), both subset theories within SDT (Deci & Ryan 1980).

OIT describes the concepts of intrinsic and extrinsic motivation (Deci & Ryan, 1980). Although originally thought to be dichotomous (Deci & Ryan, 1980), more recent research has suggested that human behavior cannot be simplified into an either-or explanation and that intrinsic and extrinsic motivation lie on a continuum which is determined by varying degrees of self-determination (Deci & Ryan, 1985, 1991). Intrinsic motivation is self-determined, free from external pressures or control. Conversely, extrinsic motivation is largely determined by outside pressure or control and can range between being somewhat self-determined to completely non-self-determined. Amotivation conveys a lack of any self-determination or controlling drives for a given activity.

There are four types of extrinsic motivation on the continuum that increase towards self-determined motives for a given behavior. External regulation is the most extrinsic, indicating an

absence of self-determination. Externally motivated individuals perform an exercise to either obtain a reward or avoid punishment. Introjected regulation implies that individuals self-impose their reasons for exercise (e.g., experience guilt). Identified regulation occurs when individuals are exercising out of choice, although the choice is still for extrinsic rewards (e.g. losing weight and looking good) (Berger, Pargman & Weinberg, 2002). Finally, integrated regulation occurs when the behaviors are considered a part of the self but are still performed for some instrumental value (e.g. self-enforced rules). In contrast, intrinsic motivation is the most self-determined and occurs when individuals experience satisfaction, satisfy an interest or encounter joy when performing the given behavior (Vallerand, Pelletier, Blais, Briere, Senecal, & Vallieres, 1992).

Amotivation is also part of the self-determination continuum. Individuals who are amotivated are not concerned with their actions and potential outcomes and thus do not experience any aspect of intrinsic or extrinsic motivation (Deci & Ryan, 1985; 1991). Those exercising for intrinsically-related reasons, such as for enjoyment, generally show a greater level of adherence to an exercise program opposed to those who are motivated by extrinsic motivational reasons (Biddle, Soos, & Chatzisarantis, 1999; McAuley, Wraith & Duncan, 1991).

Intrinsic and extrinsic motivation are multidimensional meaning that individuals may be influenced in a variety of ways by each (Vallerand & Losier, 1999). In order to adopt a physically active lifestyle, intrinsic motivation is key (Biddle, Soos, & Chatzisarantis, 1999). Cognitive Evaluation Theory (CET) describes certain social-contextual factors that influence intrinsic motivation: 1) autonomy (i.e. individuals choose their own actions); 2) relatedness (i.e. individuals perceive a positive relationship with others); and 3) competence (i.e. individuals perceive they are capable of achieving at given tasks) (Deci & Ryan, 1985). Intrinsic motivation will likely be optimized when individuals perceive themselves in control of whether they

participate, are afforded opportunities to cultivate relationships with other participants and receive consistent feedback that confirms their personal competence in a given area (Ryan & Deci, 2000). Conversely, if the three basic psychological needs are not met, or are pitted against one another, self-determined motives for physical activity will not be realized (Koestner & Losier, 2002).

Satisfaction of the three basic psychological needs in a physical activity context leads to more self-determined motives for exercise (McDonough & Crocker, 2007; Vlachopoulos & Michailidou, 2006; Wilson, Mack, Muon & LeBlanc, 2007). More self-determined reasons for exercise are suggested to promote psychological well-being (Deci & Ryan, 1985, 2002; Ryan & Deci, 2000). For example, when individuals report more self-determined motives for physical activity, their persistence towards exercise is greater (Ryan, Frederick, Lepes, Rubio & Sheldon, 1997; Sheldon, Elliot, Kim & Kasser, 2001; Wilson & Rodgers, 2004; Wilson, Rodgers, Fraser & Murray, 2004), they report greater levels of flow during exercise (Kowal & Fortier, 2000) and they express a greater interest in exercise (Li, 1999). In addition, self-determined exercise motivation has been linked to enhanced physical self-worth (Thogersen-Ntoumanis & Ntoumanis, 2007). In a sport environment, intrinsic motivation predicts adaptive responses such as the ability to concentrate, interest in more challenging tasks and more positive affect (Standage, Duda & Ntoumanis, 2005).

In contrast, more controlling reasons for exercise are proposed to be linked to psychological ill-being and highly contingent self-worth (Deci & Ryan, 2002). Standage, Duda & Ntoumanis (2005) found that more controlling motivation for physical activity in a school setting as well as amotivation were positive predictors of unhappiness and negative affect. More controlling reasons for exercise has also been associated with lower self-esteem (Kernis,

Paradise, Whitaker, Wheatman & Goldman, 2000). More extrinsically motivated reasons for exercise can be detrimental to the participants' adherence. In a study considering use of a university fitness center among the student population, Ryan, et al (1997) found that extrinsic motivation predicted short-term adherence to usage of the recreation center. The motivational climate considers the influence of self and social perceptions on individuals' exercise experiences, suggesting that intrinsically motivated reasons for exercise may be undermined when an ego-involving climate is dominate (Vallerand & Losier, 1999).

While intrinsic motivation is the best predictor of prolonged involvement in the given behavior, truly intrinsically motivated individuals are rare in the exercise domain (Ryan, et al., 1997). Ryan (1995) contends that internalized extrinsic motives can influence behavior change. Research has identified a link between introjected regulation and more frequent exercise behaviors (Thogersen-Ntoumani & Ntoumanis, 2006; Wilson, Rodgers, Carpenter, Hall, Hardy & Fraser., 2004). Likewise, Wilson, Rodgers, Blancard and Gessell (2003) found that identified regulation is also associated with more positive motivational responses. Specifically, the researchers concluded that identified motives for exercise were associated with more frequent exercise behavior, positive attitudes toward exercise and greater overall physical fitness levels. Therefore, benefits may be found in exercise programs that promote more self-determined motives for exercise, even if intrinsic motivation is never fully realized.

Few studies have considered whether the effects of psychological needs on psychosocial outcomes is fully mediated by self-determined motivation or whether psychological needs may also have direct effects on the outcomes. Vallerand and Losier (1999) suggest that self-determined motivation may be a mediator to predicted cognitive, affective and behavioral consequences of physical activity. In other words, the model proposed by Vallerand and Losier

suggests that the social context in physical activity settings leads to psychological needs fulfillment. When psychological needs are met, the degree of self-determined motivation towards the physical activity is influenced which then predicts the cognitive, affective and behavioral outcomes of the given activity. Research has supported the mediator model (Kowal & Fortier; Ntoumanis, 2001; Standage, Duda & Ntoumanis, 2003, 2005). However, a recent study involving dragon boat adult racers by McDonough and Crocker (2007) concluded that self-determined motivation only partially mediated the effects of positive and negative affect, a measure of psychological well-being. The researchers suggested that further research is needed in adult physical activity contexts to determine the extent to which self-determined motivation mediates the effects of psychological need fulfillment on the intended psychosocial outcomes.

Compared to external and introjected regulation, the more self-determined identified and intrinsic regulations promote both psychological well-being (Edmunds, Ntoumanis & Duda, 2007; Wilson & Rodgers, 2002) and enduring patterns of behavior in the sport and exercise fields (Mullan & Markland, 1997; Pelletier, Forteir, Vallerand & Briere, 2001; Wilson, Rodgers, Fraser & Murray, 2004). Fulfillment of the psychological needs plays a role in motives regulating exercise behavior (Wilson & Rogers, 2008). Therefore interventions that wish to influence motivational outcomes and promote adaptive behavioral change might support the inclusion of psychological need satisfaction within the SDT framework (Sheldon, Williams & Joiner, 2003).

Instrumentation Development: SDT

In order to measure individuals' degree of self-determination, the 15-item Behavioral Regulation in Exercise Questionnaire (BREQ, Mullan, Markland & Ingledew, 1997) was created. The BREQ assesses participants' level of motivation on the self-determination

continuum described by Deci and Ryan (1985, 1991). The questionnaire includes the following subscales: external, introjected, identified and intrinsic forms of regulation of exercise behavior. The BREQ originally included integrated regulation as well, but the authors chose to eliminate this scale after their results with sport-center attendees and workers indicated no differentiation between the integrated and intrinsic subscales. Wilson, Rodgers, Loitz, and Scime (2006) created a revised version of the BREQ including the integrated regulation subscale. The researchers found support for the structural validity and reliability of the BREQ scores, as well as convergent/divergent validity and criterion validity.

Sample items of the BREQ include, "I don't see why I should have to exercise"; "I exercise because other people say I should" (external); "I feel guilty when I don't exercise" (introjected); "I exercise because it is consistent with my life goals" (integrated); "I value the benefits of exercise" (identified), "and "I exercise because it's fun" (intrinsic). The questionnaire uses a 5-point Likert response scale, with options ranging from 1 = not true for me to 5 = very true for me.

Two scoring options are available on the BREQ depending upon the research question. The relative autonomy index is a single score derived from the subscales indicating the degree of self-determination reported by participants. Each subscale score is multiplied by its weighting and then scores are summed. The original BREQ authors offer the following suggestion for the weightings if using a version with an odd number of subscales:

External regulation	-3
Introjected regulation	-2
Identified regulation	-1
Integrated regulation	+2

Intrinsic regulation +3

In addition, the BREQ can be used so that each multidimensional scale results in a score. In order to obtain a score for each scale (i.e., external, introjected, identified, integrated, intrinsic), a mean score is calculated for each scale.

Structural validity for the BREQ has been supported (Wilson, Rodgers & Fraser, 2002) and alpha levels have ranged from .70 to .92 for the four-factor structure across research studies (Mullan & Markland, 1997; Mullan, Markland & Ingledew, 1997; Edmunds, et al., 2006). Previous research with the BREQ has also shown evidence for construct validity and reliability. Specifically, the BREQ has been supported as a multidimensional 4-factor structure (Wilson, Rodgers & Fraser, 2002) and invariance across genders (Mullen, Markland & Ingledew 1997). The BREQ's ability to discriminate between physically active and non-active individuals has also been supported (Mullen & Markland, 1997; Landry & Solomon, 2004).

While the BREQ addresses degree of self-determination in exercise motivation, the satisfaction of the three basic psychological needs is not addressed in this particular instrument. Previous studies have attempted to piece together various instruments to target the needs. However, due to a lack of consistent instrumentation, research has consequently given more attention to competence than either autonomy or relatedness (Vallerand, 2001), although Deci and Ryan (2002) propose that all three concepts are important.

In order to determine the degree to which participants experience satisfaction of the three basic needs according to SDT (Deci & Ryan, 1985, 1991), the Psychological Need Satisfaction in Exercise (PNSE; Wilson, Rogers, Rodgers & Wild, 2006) was created. The PNSE is an 18-item measure made up of three subscales (6 items each) designed to assess participants' perceptions of autonomy, competence and relatedness experienced during a typical exercise

session. The questionnaire uses a 6-point Likert scale, with 1 = false to 6 = true. Wilson, et al. (2006) provided initial evidence supporting the structural and convergent validity of the PNSE among young adult exercisers. The alpha coefficients for the subscales ranged from .90 to .91. Likewise, Wilson & Rogers found alpha coefficients ranging from .91 to .93 for the PNSE subscales among a sample of undergraduate students and college staff enrolled in aerobic classes. One study utilizing the PNSE found mixed support for the structural and criterion validity, indicating a mediocre overall fit- RMSEA = .10, CFI = .93, SRMR = .06. However, the researchers used a modified version of the instrument and the sample involved adult athletes involved in a team-specific sport known as dragon racing (McDonough & Crocker, 2007).

Overall, the PSNE appears psychometrically sound, predicting indices of internalized well-being as reflected in SDT (Wilson & Rodgers, 2005). The measure yields three subscale scores. However, Hagger, Chatzisarantis & Harris (2006) have found that satisfaction of the three basic psychological needs can be explained by a single global score, suggesting that one score may be sufficient depending on the research question pursued. To date, no known studies have attempted a single global score.

Intervention – Combining AGPT & SDT Framework

Experts in the sport and exercise psychology field have advocated for studies that advance our understanding of how AGPT and SDT relate to the exercise domain. For example, Ntoumanis (2001) endorsed research attempting to integrate AGPT and SDT frameworks in order to study the often overlooked constructs of autonomy and relatedness. Likewise, Wang and Biddle (2007) suggested more research investigating the links between the constructs of the two theories.

Exercise facilities such as recreation centers may be an ideal setting to foster the three needs of intrinsic motivation. Research has shown that interventions targeted towards training exercise leaders in an SDT framework is possible (Edmunds, Ntoumanis & Duda, 2008). In order to manipulate the environment to meet the three basic psychological needs, Deci and Ryan (1991; Deci, 1995) have suggested individuals in positions of authority should implement the following constructs in their particular setting: autonomy support, structure and involvement. The constructs have been posited to influence more autonomous forms of motivation by allowing individuals to internalize the meaning and purpose for physical activity (Deci, 1995; Deci, et al., 1994; Williams, Deci & Ryan, 1998). All three constructs are applicable to the exercise domain (Markland, 1999).

Of the three constructs, autonomy support has been the most studied (Hagger, Chatzisarantis, Culverhouse & Biddle, 2003; Wilson, Rodgers, Blanchard & Gessell, 2003). When a leader is trained to provide autonomy support, he or she listens with empathy, offers choices to participants, has the ability to view the situation from the participants' perspective and provides rationales for ideas in the class without pressuring individuals (Deci, 1995; Deci & Ryan, 2002; Williams, Gagne, Ryan & Deci, 2002). Research has found that those who experience autonomy support in both sport and exercise settings report more self-determined reasons for their given activity (Edmunds, Ntoumanis, & Duda, 2006; Vallerand & Losier, 1999) as well as adaptive motivational outcomes and behaviors in exercise settings (Vansteenkiste, Simons, Soenens & Lens, 2004; Wilson & Rodgers, 2004).

The other two concepts, structure and interpersonal involvement, also help to influence the degree to which exercise participants' experience autonomous forms of motivation. For example, the concept of structure suggests that exercise leaders provide realistic, but

unambiguous feedback. The leader's expectations should be clear (Reeve, 2002; Ryan, 1993). Thus, exercise leaders should make the goals of the class clear from the beginning. Finally, the third component, interpersonal involvement, occurs when leaders authentically support participants' well-being by investing their time, energy and affection (Deci & Ryan, 2002; Reeve, 2002). Exercise leaders can practice interpersonal involvement by remaining non-judgmental of individuals and their exercise goals and offering their support unconditionally (Deci & Ryan, 1991).

The only known research study to consider autonomy support, structure and involvement all together was an experimental design by Edmunds, Ntoumanis and Duda (2008) who compared an aerobics class marked in an SDT framework against a control aerobic class. The SDT class instructor was trained to target three specific areas: (1) to provide autonomous support, meaning the instructor should attempt to view situations in the class from the perspective of the participant and encourage participants to make their own decisions (Williams, Gagne, Ryan & Deci, 2002); (2) to provide structure, meaning the instructor makes expectations clear and provides feedback to participants (Reeve, 2002; Ryan, 1993); and (3) to provide interpersonal involvement, meaning the instructor should be willing to invest time and energy in the class and show affection towards participants (Reeve, 2002). The same instructor taught both the SDT class and the control class, and was periodically monitored and evaluated by a panel of experts on consistency of class delivery. Edmunds, et al. not only concluded that training exercise instructors to create a class environment marked by those indicators was possible, but also that the SDT class had more increases in positive affect and overall class participation than the control group. In addition, the three conditions (i.e. autonomy support, structure and interpersonal involvement) were positively linked to behavior intention in exercise.

The concepts of autonomy-support, structure and involvement offer guidelines for exercise leaders on how they might foster autonomous exercise motivation. While these concepts are similar to those found in AGPT (e.g. both autonomy support and task-involving climates emphasize offering choices to participants; both interpersonal involvement and caring climates emphasize participant interaction; etc), few studies have attempted to specifically integrate Achievement Goal Perspective Theory with Self-Determination Theory. However, research has suggested a positive link between the two. For example, Parish and Treasure (2003) surveyed adolescent students in physical education settings and found that students' perceptions of a task-involving climate (termed mastery) were associated with more self-determined motivation for the activities while perceptions of a ego-involving climate (termed performance) were associated with less self-determined motivation. The researchers also found that more self-determined motivation and perceived competence for the given activity were associated with more commitment to physical activity. In addition, perceptions of a task-involving climate have been associated with intrinsic motivation in physical activity settings (Kavussanu & Roberts, 1996; Newton & Duda, 1999; Vallerand & Losier, 1999; White & Duda, 1994).

Task-involving climates in both the sport and physical education domains have been shown to support feelings of competence (Ferrer-Caja & Weiss, 2000; Kavussanu & Roberts, 1996; Reinboth & Duda, 2004) , autonomy (Ferrer-Caja & Weiss, 2000; Standage, et al., 2003) and to a lesser-extent, relatedness (Sarrazin, et al., 2002). For example, Ryan, Vallerand and Deci (1984) performed an extensive review of intrinsic motivation and sport-related research. Their research found that social environments can facilitate intrinsic motivation to participate in physical activity. Positive self-perceptions of physical condition, sports competence and a task orientation for exercise are related to indices of intrinsic motivation and self-efficacy while an

ego orientation is related to indices of extrinsic motivation (Boyd, Weinmann & Yin, 2002; Cury, et al., 1996; Kavussanu & Roberts, 1996).

In a study to test the mediating roles of perceived competence, autonomy and relatedness in relationships between perceptions of a task-involving climate and motivation in middle school physical education students, Cox and Williams (2008) found that perceptions of a task-involving climate were positively associated with perceptions of competence, autonomy and relatedness. However, the researchers also found that perceptions of a task-involving climate related directly to self-determined motivation for physical activity, suggesting that the three basic psychological needs may not play a mediating role. However, this study was conducted with adolescents in a physical education setting and more research is needed to determine whether competence, autonomy and relatedness have any mediating effects on motivation for exercise.

In physical education, Escarti and Gutierrez (2001) found that perceived competence in physical education classes had a direct effect on future physical activity intention. Jaakkola and Liukkonen (2006) found that an academic year-long intervention that increased task-involvement during physical education classes for high school students resulted in students who were more self-determined (i.e. scored lower in external regulation and amotivation than the control group). Thus, the research in both the sport and pedagogy domain indicates that a task orientation coupled with perceived competence in a physical activity environment corresponds to intrinsic motivation to participate. However, more research integrating the two frameworks is warranted.

Therefore, for a physical activity such as exercise to foster intrinsic motivation, the activity should be perceived to be interesting, challenging and satisfying as well as foster inherent pleasure (Vallerand & Fortier, 1998). These guidelines are consistent with both Nicholls' theoretical concept of a task-involving climate and the recent literature on caring

climates. Indeed, perceptions of the motivational climate appear to have implications for individuals' intrinsic motivation to participate in physical activity. However, the relationship between the tenants of AGPT and self-determined motives for exercise has received minimal attention in the literature.

Outcomes of a Positive, Supportive Exercise Climate

Commitment to Exercise

A link exists between more self-determined reasons for exercise and exercise commitment. Intrinsic motivation for exercise has been associated with greater interest in physical activity (Li, 1999) and more favorable attitudes towards exercise (Wilson, Rodgers, Blanchard & Gessell, 2003). In addition, individuals who report exercising regularly also report more self-determined motivation for exercise (Mullen & Markland, 1997). For example, in a sample of university fitness center users, Ryan, et al (1997) found that extrinsic motivation for exercise predicted short-term adherence while intrinsic motivation predicated prolonged involvement. Additional studies have also found that more self-determined reasons for exercise predict future exercise intentions (Wilson, Rodgers, Fraser & Murray, 2004).

Likewise, perceptions of a caring and task-involving climate have been associated with future commitment to exercise (Brown & Fry, 2009a). Perceived competence towards physical activity may be a key component in influencing future physical activity involvement. In the sport domain, Papaoinnou, et al (2006) found that perceived athletic competence predicted future exercise participation seven and fourteen months later. However, ego orientations among athletes did not predict future exercise involvement. Ego-involving climates foster competence only when individuals demonstrate superior ability compared with peers since effort is not considered a criterion for success by individuals highly ego-oriented (Roberts, 2001). Normative

comparison becomes the determinant of perceived competence. As long as individuals perceive themselves as highly skilled (i.e., one of the best), the amount of effort they exert is of no particular interest or consequence in ego-involving climates. Given that it has been estimated that approximately fifty percent of those who start a new exercise program discontinue within six months (Dishman, 1988), group exercise settings may not be fostering perceived competence. Moreover, task-involving motivational climates in exercise settings would seem to promote future exercise commitment given that effort and improvement would be emphasized over normative comparison.

Research in the physical education domain has yielded similar results. Lloyd and Fox (1992) conducted a six-week intervention on high school girls in aerobic classes in which they intentionally manipulated the class environment to be either task or ego-involved. The researchers found that the task-involving class participants reported higher levels of enjoyment and motivation to continue participation. This was true, regardless of the girls' initial ego orientations. Furthermore, initially girls high in ego-orientation lowered their ego orientation scores by the end of the intervention if they were in the task-involving class. The researchers concluded that their results may have implications for future curricula design in aerobic classes to increase future commitment. Carron, Hasenblas and Mack (1996) found that individuals are more likely to commit to an exercise program if they perceive their efforts are valued by their exercise class instructors. By intentionally creating an atmosphere where participants feel valued and encouraged, exercise class instructors might positively influence participants' commitment to exercise. Other researchers have also found a connection between task-involving motivational climates and future commitment to exercise among high school students (e.g. Ferrer-Caja & Weiss, 2000; Goudas, Biddle & Fox, 1994; Standage, Duda & Ntoumanis, 2003). However,

little is known about how to create a positive physical activity environment in the college environment.

Exercise commitment will be measured using the Exercise Commitment Scale **(**Alexandris, Zaharidis, Tsorbatzoudis, & Grouios, 2002**)**, which uses a Likert scale ranging from 1 (Not at All) to 5 (Extremely). The factor structure for the scale has been supported by confirmatory factor analysis.

Life Satisfaction

An indicator of psychological well-being can be thought of as the degree to which individuals are satisfied with the overall direction and experiences in their lives. Engaging in exercise has been associated with enhanced levels of life satisfaction (Grant, Todd, Aitchison, Kelly & Stoddart, 2004; McAuley, et al., 2006; Yaguchi, Otsuka, Fujita & Hatano, 1987). Yet, the potential mediators explaining this association are not well understood.

In the sport literature, Reinboth & Duda have considered perceptions of the motivational climate in relation to athletes' psychological well-being. For example, in a study involving adult athletes, the researchers found that perceptions of a task-involving climate positively predicted satisfaction of the three basic psychological needs, which in turn predicted changes in subjective vitality among participants (Reinboth & Duda, 2006). In a different study involving adolescent youth soccer and cricket players, self-esteem was highest among those perceiving a task-involving climate, while physical exhaustion and physical symptoms (e.g. illness) were positively associated with perceptions of an ego-involving climate (Reinboth & Duda, 2004). Take together, these psychological well-being variables may influence overall life satisfaction, suggesting that the climate may influence individuals' well-being.

Sheldon, Ryan, Deci, and Kasser (2004) found that when individuals use external goals (i.e. appearance, tone, weight) to dictate their exercise motivation, their self-worth becomes compromised, because their motivation is contingent on achieving their goals. The researchers contend that external goals may potentially lead to more social comparisons, which is an indicator of an ego-involving climate. Given these findings, it may stand to reason that intrinsically motivated individuals may not experience the same contingencies on their self-worth, since their decision to exercise is more to satisfy a personal desire rather than a particular end.

In a study involving undergraduate students enrolled in physical activity classes, Brown and Fry (2009b) found an association between perceptions of the motivational climate in the physical activity setting and participants' self-reported level of hope and happiness with their overall lives. Specifically, students (N = 396) who reported a high caring and task-involving climate were also more likely to report high hope, happiness and physical self-concept. Measures such as hope and happiness may be indicative of overall life-satisfaction, given that these variables may influence individuals' abilities to function optimally on a daily basis.

These studies, taken together, suggest that perceptions of the motivational climate may influence individuals' positive psychological health. While the literature has not yet addressed the specific variable "life satisfaction" from a AGPT or SDT framework, this line of inquiry will add to the growing body of literature addressing psychological well-being in exercise settings.

Life satisfaction will be assessed with Diener et al.'s Satisfaction With Life Scale (SWLS, 1985), a five-item scale in which participants rate the general extent of their satisfaction with life on a seven-point Likert scale from 1 = strongly disagree to 7 = strongly agree. Sample items include "In most ways, my life is

close to my ideal" and "The conditions of my life are excellent". In previous studies, the SWLS has demonstrated high psychometric properties (Elavsky et al., 2005; McAuley et al., 2006).

Mood States

Research has established a link between increased physical activity and enhanced positive affect (e.g. Guszkowska & Sionek, 2009; Kanning & Schlict, 2010). Given that social-environmental elements are thought to influence mood states and enjoyment for exercise is positively related to positive mood enhancement (Raedeke, 2007), it follows that perceptions of the climate should be associated with mood state. Limited research lends support for this connection. For example, task-involving climates in physical activity classes have been linked to greater enjoyment, perceived ability, and effort towards exercise (Cecchini, et al., 2001). Likewise, perceptions of ego-involving climates have been associated with higher anxiety levels (Duda & Ntoumanis, 2005). Since both enjoyment and anxiety influence mood and have been associated with perceptions of climate, positive mood should be associated with perceptions of a task-involving climate and likewise negative mood should be associated with perceptions of an ego-involving climate. However, given the limited research that has considered mood state in context of motivational climate, further exploration is warranted.

Positive mood states will be assessed using the Profile of Mood States (POMS; Usala & Hertzog, 1989), including the following constructs: vigor, well being and calmness. In addition, two constructs from the Positive and Negative Affect Schedule (PANAS; Watson & Clark, 1994) (i.e., self assurance and attentiveness) will be used. Negative mood states will be measured using constructs from the POMS (i.e., depression, anxiety, fearful, fatigue, hostility). Both instruments use a 5 Point Likert scale, with 0 = not at all accurate and 4 = extremely accurate. Positive and negative affect have been shown to be distinctive and independent of one another

(Watson, Clark & Tellegen, 1988). Although the subscale scores for each instrument are typically reported as a sum, each subscale will be treated as a separate construct for the purposes of this study to determine how individual aspects of positive and negative mood might be related to the motivational climate. Acceptable reliability has been established for both the POMS (Norcross, Guadagnoli & Prochaska, 1984) and the PANAS (Crawford & Henry, 2004).

Body Image

Another psychological well-being variable that may potentially influence individuals' exercise motivation is their perceptions of their physical self. Fox (1997) argues that self-determined motivation may act as mediator between exercise and physical self-worth. High correlations exist between aspects of the physical self (e.g. body image) with global self-esteem (Fox, 1997), suggesting that the physical self may play a role in psychological well-being. This has been supported by Thogersen-Ntoumanis and Ntoumanis (2006) who found that more self-determined motives for exercise predicted higher physical self-worth and lower social physique anxiety.

Research has revealed an association between body-related exercise motivation and self-reported negative body images. For example, Frederick and Ryan (1993) found that body-related motives for exercise were negatively associated with body-related self-esteem in exercise participants. In addition, body-related motives were positively associated with anxiety and depression. Likewise, Cash, Novy and Grant (1994) found that females reporting more appearance and weight management reasons for exercise were also more likely to report less body satisfaction and greater body-image disturbances.

If body image is associated with how individuals perceive their external appearance in relation to socially desired standards, then SDT would suggest that more self-determined reasons

for exercise are negatively associated with body image concerns (Deci & Ryan, 2000). Those with poor body image struggle to control their external appearance, which is associated with more extrinsic motivation. Fox (1997) suggested that more self-determined reasons for exercising may be important to improving individuals' self-perceptions. Exercising due to internal pressure to achieve a desired body shape may be detrimental to physical self-worth and body image (Thogersen-Ntoumani & Ntoumanis, 2006, 2007; Wilson & Rodgers, 2002). Intrinsic motivation for exercise has been shown to significantly predict physical self-worth while extrinsic motivation does not (Thogersen-Ntoumani & Ntoumanis, 2006). Enhanced physical self-worth could alleviate body image concerns.

Male and female exercisers motivated for extrinsic reasons tend to be more dissatisfied with their body, while those exercising for more health motivation report more positive self-esteem (McDonald & Thompson, 1992). In a study involving adolescent British school children, Gillison, Standage and Skevington (2006) found that children who perceived themselves as overweight and reported more peer pressure to lose weight were more likely to report extrinsic reasons for exercise (e.g. improved physical appearance and lose weight). The researchers also found that extrinsic goals to exercise negatively predicted intrinsic motivation for exercise. These findings are unfortunate given that intrinsic motivation for exercise is associated with increased effort, performance and persistence (Vansteenkiste, Simons, Lens, et al., 2004). Extrinsic reasons for exercise, such as poor body image and weight control, may be problematic for long-term exercise commitment.

Given that many different factors may influence individuals' body image, The Body Image States Scale (BISS; Cash, Fleming, Alindogan, Steadman & Whitehead, 2002) is an ideal instrument for the purposes of this current study. The BISS measures individuals' evaluation

about their physical appearance at a particular moment in time and is sensitive to positive and negative situation contexts. The scale creators have demonstrated both internal reliability and test-retest reliability for the BISS.

Conclusion

It is generally accepted among sport and exercise psychologists that task-involving climates are positively linked with adaptive behaviors in physical activity settings (Duda & Hall, 2001). Nicholls (1984) suggested that a task-involving climate encourages effort and improvement whereas an ego-involving climate fosters a focus on how individuals compare to one another. Likewise, emerging research on caring environments has found an association between safe and supportive environments and reports of greater enjoyment and emotional regulation (Newton, Watson, et al., 2007) as well as having a more favorable reaction to exercise (Cothran & Ennis, 2000). In a comprehensive literature review of self-determination research across a wide variety of life contexts, Vallerand (1997) concluded that self-determined motives for exercise is related to more adaptive outcomes. Taken together, the behaviors associated with the creation of a caring and task-involving climate are more positive, and thus are likely to influence individuals' fulfillment of relatedness, competence and autonomy leading to more self-determined reasons for exercise. Given the potential benefits of a positive and supportive motivational climate in physical activity settings and the paucity of research on group exercise settings, the current study focuses on college students' perceptions of the caring and motivational climate in the campus recreation and fitness center.

References

Adams, T. M., & Brynteson, P. (1992). A comparison of attitudes and exercise habits of alumni from colleges with varying degrees of physical education activity programs. *Research Quarterly for Exercise and Sport, 63*, 148-152. Pmid: 1585061

Alexandris, K., Zahariadis, P., Tsorbatzoudis, C., & Grouios, G. (2002). Testing the sport commitment model in the context of exercise and fitness participation. *Journal of Sport Behavior, 25*(3), 217.

American College Health Association. (2002). *Healthy Campus 2010: Make it Happen*. Baltimore, MD: American College Health Association.

American Psychological Association. (2004). Exercise fuels the brain's stress buffers. *In APA Help Center.* Retrieved September 28, 2009, from http://www.apa.org

Ames, C. (1992). Classrooms, goals, structures and student motivation. *Journal of Educational Psychology, 84*, 261-271. doi:10.1037/0022-0663.84.3.261

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80*(3), 260-267. doi:10.1037/0022-0663.80.3.260

Battistich, V., & Hom, A. (1997). The relationship between students' sense of their school as a community and their involvement in problem behaviors. *American Journal of Public Health, 87*(12), 1997-2001. doi:10.2105/AJPH.87.12.1997

Battistich, V., Solomon, M., Watson, D., & Schaps. (1997). Caring school communities. *Educational Psychologist 32*(3), 137-152. doi:10.1207/s15326985ep3203_1

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.

doi:10.1037/0033-2909.117.3.497

Berger, B.G., Pargman, D., & Weinberg, R.S. (2002). Motivational determinants of exercise behavior. *In Foundations of Exercise Psychology* (pp.216-217). Morgantown, WV: Fitness Information Technology, Inc.

Biddle, S., & Mutrie, N. (2001). *Psychology of Physical Activity: Determinants, well-being and interventions*. London: Routledge.

Biddle, S., Soos, I., & Chatzisarantis, N. (1999). Predicting physical activity intentions using goal perspectives and self-determination theory approaches. *European Psychologist, 4,* 83-89.

Blakeslee, S. (2006, October 3). Out-of-body experience? Your brain is to blame. *New York Times.* Retrieved from http://www.nytimes.com

Blanchard, C. M., Rodgers, W. M., & Gauvin, L. (2003). The influence of exercise duration and cognitions during running on feeling states in an indoor running track environment. *Psychology of Sport & Exercise, 5*, 119-133. doi:10.1016/S1469-0292(03)00006-2

Bouchard, C., Blair, S. n., & Haskell, W. L. (2007). *Physical activity and health*. Champaign, IL: Human Kinetics.

Boyd, M. P., Weinmann, C., & Yin, Z. (2002). The relationship of physical self-perceptions and goal orientations to intrinsic motivation for exercise. *Journal of Sport Behavior, 25*(1), 1-18.

Brown, T.C. & Fry, M.D. (2009a). [Relationship of exercise participants' perceptions of the caring climate to their motivational responses in college aerobic classes]. Unpublished raw data.

Brown, T.C. & Fry, M.D. (2009b). [The motivational climate and psychological well-being for

males and females in college exercise classes]. Unpublished raw data.

Carron, A.V., Hausenblas, H.A. & Mack, D. (1996). Social influence and exercise: A meta-analysis. *Journal of Sport & Exercise Psychology*, 18, 1-16.

Cash, T. F., Novy, P. L., & Grant, J. R. (1994). Why do women exercise? Factor analysis and further validation of the Reasons for Exercise Inventory. *Perceptual and Motor Skills, 78*, 539-544.

Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the body image states scale. *Eating Disorders, 10*(2), 103-113. doi:10.1080/10640260290081678

Cecchini, J. A., Gonzalez, C., Carmona, A. M., Arruza, J., Escarti, A., & Balague, G. (2001). The Influence of the Physical Education Teacher on Intrinsic Motivation, Self-Confidence, Anxiety, and Pre- and Post-Competition Mood States. *European Journal of Sport Science, 1*(4), 1.

Cothran, D.J., & Ennis, C.D. (2000). Building bridges to student engagement: Communicating respect and care for students in urban high schools. *Journal of Research and Development in Education*, 33, 106-117.

Cox, A., & Williams, L. (2008). The role of perceived teacher support, motivational climate, and psychological need satisfaction in students' physical education motivation. *Journal of Sport & Exercise Psychology, 30*, 222-239.

Crawford, J.R., & Henry, J.D. (2004). The Positive and Negative Affect Schedule (PANSA): Construct validity, measurement properties and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 43*, 245-265.

Cury, F., Biddle, S., Famose, J., Goudas, M., Sarrazin, P., & Durand, M. (1996). Personal and

situational factors influencing intrinsic interest of adolescent girls in school physical education: A structural equation modeling analysis. *Educational Psychology, 16*, 305-315. doi:10.1080/0144341960160307

Deci, E. L. (1975). *Intrinsic Motivation*. New York, NY, US: Plenum Press.

Deci, E. L. (1995). *Why we do what we do: The dynamics of personal autonomy*. New York: G.P. Putnam's Sons.

Deci, E. L., Eghrar, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality, 62*(1), 119-142.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125*(6), 627-668. doi:10.1037/0033-2909.125.6.627

Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivation processes. *Advances in Experimental Social Psychology, 13*, 39-80. doi:10.1016/S0065-2601(08)60130-6

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.

Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R.A. Dienstbier (Ed.), *Nebraska symposium on motivation 1991: Vol 38. Perspectives on motivation: Current theory and research in motivation* (pp.237-28). Lincoln, NE: University of Nebraska Press.

Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227-268. doi:10.1207/S15327965PLI1104_01

Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.

Diener, E., Emmons, R., Larsen, R., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49,* 71-75. doi:10.1207/s15327752jpa4901_13

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*(2), 276-302. doi:10.1037/0033-2909.125.2.276

Dishman, R.K. (1988). Exercise adherence research: Future directions. *American Journal of Health Promotion, 3,* 52-56.

Duda, J.L., Chi, L., Newton, M.L., Walling, M.D., & Catley D. (1995). Task and ego orientation and intrinsic motivation in sport. *International Journal of Sport Psychology*, 26, 40-63.

Duda, J., & Hall, H. (2001). Achievement goal theory in sport: Recent extensions and future directions. In R. Singer, H. A. Hausenblas, & C. M. Janelle (Eds.), *Handbook of Sport Psychology* (pp. 417 – 443). New York: Wiley.

Duda, J. L., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*(3), 290-299. doi:10.1037/0022-0663.84.3.290

Duda, J. L., & Ntounumis, N. (2005). After-school sport for children: Implications of a task-involving motivational climate. In J. Mahoney, R. Larson, & J. Eccles (Eds.), *Organized activities as contexts of development* (pp. 311–330). Mahwah, NJ: Erlbaum.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95*, 256-273. doi:10.1037/0033-295X.95.2.256

Edmunds, J., Ntoumanis, N., & Duda, J. L. (2006). A test of self-determination theory in the exercise domain. *Journal of Applied Sport Psychology, 36*(9), 2240-2265. doi:10.1111/j.0021-9029.2006.00102.x

Edmunds, J., Ntoumanis, N., & Duda, J. L. (2007). Adherence and well-being in overweight and obese patients referred to an exercise on prescription scheme: A self-determination theory perspective. *Psychology of Sport and Exercise, 8*(5), 722-740. doi:10.1016/j.psychsport.2006.07.006

Edmunds, J., Ntoumanis, N., & Duda, J. L. (2008). Testing a self-determination action theory-based teaching style intervention in the exercise domain. *European Journal of Social Psychology, 38,* 375-388. doi:10.1002/ejsp.463

Elliot, E., & Dweck, C. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology, 54*, 5-12. doi:10.1037/0022-3514.54.1.5

Ennis, C. (1999). Communicating the value of active, healthy lifestyles to urban students. *Quest, 51,* 164-169.

Escarti, A., & Gutierrez, M. (2001). Influence of the motivational climate in physical education on the intention to practice physical activity or sport. *European Journal of Sport Science, 1*(4), 1-12. doi:10.1080/17461390100071406

Elavasky, S., McAuley, E., Motl, R. W., Konopack, J. F., Marquez, D. X., Hu, L., et al. (2005). Physical activity enhances long-term quality of life in older adults: Efficacy, esteem and affective influences. *Annals of Behavior Medicine, 30*, 138-145. doi:10.1207/s15324796abm3002_6

Ferrer-Caja, E., & Weiss, M. R. (2000). Predictors of intrinsic motivation among adolescent students in physical education. *Research Quarterly for Exercise and Sport, 71*, 267-279.

Fox, K. R. (1997). The physical self and processes in self-esteem development. In K. R. Fox (Ed.), *The physical self: From motivation to well-being* (pp. 111-139). Champaign, IL: Human Kinetics. doi:10.1017/S1368980099000567

Fox, K.R. (1999). The influence of physical activity on mental well-being. *Public Health Nutrition*, 2 (3a), 411-418.

Fox, K. R., Stathi, A., McKenna, J., & Davis, M. G. (2006). Physical activity and mental well-being in older people participating in the Better Ageing Project. *European Journal of Applied Physiology, 100*, 591-602. doi:10.1007/s00421-007-0392-0

Frederick, C. M., & Ryan, R. M. (1993). Differences in motivation for sport and exercise and their relations with participation and mental health. *Journal of Sport Behavior, 16,* 124-146.

Fry, M. (2000a). A developmental analysis of children's and adolescents' understanding of luck and ability in the physical domain. *Journal of Sport & Exercise Psychology, 22*, 145-166.

Fry, M. D. (2000b). A developmental examination of children's understanding of task difficulty in the physical domain. *Journal of Applied Sport Psychology, 12*(2), 180-202. doi:10.1080/10413200008404222

Fry, M. D., & Duda, J. L. (1997). Children's understanding of effort and ability in the physical and academia domains. *Research Quarterly for Exercise and Sport, 68*, 331-334.

Fry, M. D., & Newton, M. (2003). Application of Achievement Goal Theory in an Urban Youth Tennis Setting. *Journal of Applied Sport Psychology, 15*, 50-66. doi:10.1080/10413200305399

Gano-Overway, L. A., Guivernau, M., Magyar, T. M., Waldron, J. J., & Ewing, M. E. (2003). Achievement goal perspectives, perceptions of the motivational climate and

sportspersonship: Individual and team effects. *Psychology of Sport and Exercise, 6*(2), 215-232. doi:10.1016/j.psychsport.2003.11.001

Gano-Overway, L. A., Newton, M., Magyar, T. M., Fry, M. D., Kim, M. S., & Guivernau, M. R. (2009). Influence of caring youth sport contexts on efficacy-related beliefs and social behaviors. *Developmental Psychology, 45 (2*), 329-340. doi:10.1037/a0014067

Gillison, F. B., Standage, M., & Skevington, S. M. (2006). Relationships among adolescents' weight perceptions, exercise goals, exercise motivation, quality of life and leisure-time exercise behaviour: A Self-Determination Theory approach. *Health Education Research*.

Goudas, M., Biddle, S., & Fox, K. (1994). Perceived locus of causality, goal orientations and perceived competence in school physical education classes. *British Journal of Educational Psychology, 64*, 453-463.

Grant, S., Todd, K., Aitchison, T. C., Kelly, P., & Stoddart, D. (2004). The effects of a 12-week group exercise programme on physiological and psychological variables and function in overweight women. *Public Health, 118*, 31-42. doi:10.1016/S0033-3506(03)00131-8

Guszkowska, M., & Sionek, S. (2009). Changes in mood states and selected personality traits in women participating in a 12-week exercise program. *Human Movement, 10*(2), 163-169. doi:10.2478/v10038-009-0014-2

Hagger, M. S., & Chatzisarantis, N. L. D. (2007). *Intrinsic motivation and self-determination in exercise and sport*. Champaign, IL: Human Kinetics.

Hagger, M., Chatzirasrantis, N., Culverhouse, T., & Biddle, S. (2003). The processes by which perceived autonomy support in physical education promotes leisure-time physical activity intentions and behavior: A trans-contextual model. *Journal of Educational Psychology, 95*(4), 784-795. doi:10.1037/0022-0663.95.4.784

Hagger, M., Chatzirasrantis, N., & Harris, J. (2006). From psychological need satisfaction to intentional behavior: Testing a motivational sequence in two behavioral contexts. *Personality and Social Psychology Bulletin, 32*, 131-138. doi:10.1177/0146167205279905

Harter, S. (1980). A model of intrinsic mastery motivation in children: Individual differences and developmental change. In W. A. Collins (Ed.), *Minnesota symposium in child psychology* (Vol. 14). Hillsdale, NJ: Erlbaum.

Hassman, P., Koivula, N., & Uutela, A. (2000). Physical exercise and psychological well-being: A population study in Finland. *Preview of Medicine, 30,* 17-25. doi:10.1006/pmed.1999.0597

Healthy People 2020 (Group) & National Center for Health Statistics (U.S.) 2001 Healthy People 2020 statistical notes [electronic resource] / from the Centers for Disease Control and Prevention/National Center for Health Statistics.

Huddleston, H., Fry, M. D. & Brown, T.C. (2011). *The relationship of college students' perceptions of their BMI and weight status to their physical self-concept.* Manuscript submitted for publication.

Jaakkola, T., & Liukkonen, J. (2006). Changes in Students' Self-Determined Motivation and Goal Orientation as a Result of Motivational Climate Intervention within High School Physical Education Classes. *Journal of Sport and Exercise Psychology, 4*, 302-324.

Juan, W.Y. & Britten, P. (2008). Routine active and sedentary behavior patterns in US adults. *United States Department of Agriculture: Center for Nutrition Policy and Promotion.* Retrieved February 16, 2009, from http://www.cnpp.usda.gov/Publications/NutritionInsights/Insight40.pdf

Kanning, M., & Schlicht, W. (2010). Be Active and Become Happy: An Ecological Momentary Assessment of Physical Activity and Mood. *Journal of Sport & Exercise Psychology, 32*(2), 253-261.

Kavussanu, M., & Roberts, G. C. (1996). Motivation in physical activity contexts: The relationship of perceived motivational climate to intrinsic motivation and self-efficacy. *Journal of Sport & Exercise Psychology, 18*, 264-280.

Keating, X. D., Guan, J., Pinero, J. C., & Bridges, D. M. (2005). A meta-analysis of college students' physical activity behaviors. *Journal of American College Health, 54*(2), 116-125. doi:10.3200/JACH.54.2.116-126

Kernis, M. H., Paradise, A. W., Whitaker, D. J., Wheatman, S. R., & Goldman, B. N. (2000). Master of one's psychological domain? Not likely if one's self-esteem is unstable. *Personality & Social Psychology Bulletin, 26*, 1297-1305. doi:10.1177/0146167200262010

Koestner, R., & Losier, G. F. (2002). Distinguishing three ways of being internally motivated: A closer look at introjection, identification, and intrinsic motivation. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.

Kowal, J., & Fortier, M. S. (2000). Testing relationships from the hierarchical model of intrinsic and extrinsic motivation using flow as a motivational consequence. *Research Quarterly for Exercise and Sport, 71*, 171-181. PMid:10925814

Kujala, U.M., Kaprio, J., Sarna, S. et al. (1998). Relationship of leisure-time physical activity and mortality: The Finnish twin cohort. *Journal of the American Medical Association 279*(6):440-444. PMid:8484377

LaCroix, A.Z., Guralnik, J.M., Berkman, L.F. & et al. (1993). Maintaining mobility in life. II. Smoking, alcohol consumption, physical activity, and body mass index. *American Journal of Epidemiology, 137*(8):858-869.

Landry, J. b., & Solmon, M. A. (2004). African American women's self-determination across the stages of change for exercise. *Journal of Sport and Exercise Psychology, 26*, 457-469.

Larson, A. (2006). Student perception of caring teaching in physical education. *Sport, Education and Society, 11*(4), 337-352. doi:10.1080/13573320600924858

Li, F. (1999). The Exercise Motivation scale: Its multifaceted structure and construct validity. *Journal of Applied Sport Psychology, 11*, 97-115. doi:10.1080/10413209908402953

Lloyd, J., & Fox, K. (1992). Achievement goals and motivation to exercise in adolescent girls: A preliminary intervention study. *British Journal of Physical Education Research Supplement, 11*, 12-16. PMid:12237980

Locke, E.A., & Latham, G.P. (2002). Building a practically useful theory of goal settings and task motivation: A 35-year old odyssey. *American Psychologist, 57*, 705-717. doi:10.1037/0003-066X.57.9.705

Magyar, T. M., Guivernau, M. R., Gano-Overway, L. A., Newton, M., Mi-Sook, K., Watson, D. L., et al. (2007). The Influence of Leader Efficacy and Emotional Intelligence on Personal Caring in Physical Activity. *Journal of Teaching in Physical Education, 26*, 310-319.

Markland, D. (1999). Self-determination moderates the effects of perceived competence on intrinsic motivation in an exercise setting. *Journal of Sport & Exercise Psychology, 21*, 351-261.

Martin Ginis, K. A., Latimer, A. E., & Jung, M. E. (2003). No pain no gain? Examining the

generalizability of the exerciser stereotype to moderately active and excessively active targets. *Social Behavior and Personality, 31*, 283-290. doi:10.2224/sbp.2003.31.3.283

McAuley, E., Konopack, J. F., Motl, R. W., Morris, K. S., Doerksen, S. E., & Rosengren, K. S. (2006). Physical activity and quality of life in older adults: Influence of health status and self-efficacy. *Annals of Behavioral Medicine, 31*, 99-103. doi:10.1207/s15324796abm3101_14

McAuley, E., Wraith, S., & Duncan, T. E. (1991). Self efficacy, perceptions of success, and intrinsic motivation for exercise. *Journal of Applied Social Psychology, 21*, 139-155.

McDonald, K., & Thompson, J. K. (1992). Eating disturbance, body image dissatisfaction, and reasons for exercising: Gender differences and correlational findings. *International Journal of Eating Disorders, 11*, 289-292.

McDonough, M. H., & Crocker, P. R. E. (2007). Testing Self-Determined Motivation as a Mediator of the Relationship Between Psychological Needs and Affective and Behavioral Outcomes. *Journal of Sport & Exercise Psychology, 29*(5), 645-663. doi:10.1002/1098-108X(199204)11:3<289::AID-EAT2260110314>3.0.CO;2-F

Merriam-Webster dictionary. (2009). In *Encyclopedia Britannica*. Retrieved November 29, 2009, from Encyclopedia Britannica Online: http://www.britannica.com/EBchecked/topic/376313/Merriam-Webster-dictionary

Miller, B. W., Roberts, G. C., & Ommundsen, Y. (2004). Effect of motivational climate on sportspersonship among competitive youth male and female football players *Scandinavian Journal of Medicine & Science in Sports, 14*, 193-202. doi:10.1111/j.1600-0838.2003.00320.x

Moore, E. W. G., & Fry, M. D. (2009, September 16, 2009). *"The Effect of a Caring and Task-*

Involving Climate on Student Empowerment and Ownership in Physical Activity Classes." Paper presented at the Association for Applied Sport Psychology, Salt Lake City, UT.

Mullen, E. & Markland, D. (1997) Variations in self-determination across the stages of change for exercise in adults. *Motivation and Emotion, 21,* 349-362.

Mullen, E., Markland, D., & Ingledew, D. K. (1997). A graded conceptualization of self-determination in the regulation of exercise behaviour: Development of a measure using confirmatory factor analytic procedures. *Personality and Individual Differences, 23*(5), 745-752. doi:10.1023/A:1024436423492

National Center for Health Statistics. (2006). *Fast stats a to z.* Retrieved February 16, 2009, from http://www.cdc.gov/nchs/fastats/exercise.htm

Nelson, M.E., Fiatarone, M.A., Morganti, C.M. & et al. (1994). Effects of high-intensity strength training on multiple risk factors for osteoporotic fractures: A randomized controlled trial. *Journal of the American Medical Association* 272(24),1909-1914.

Newton, M., Duda, J. L., & Yin, Z. (2000). Examination of the psychometric properties of the perceived motivational climate in sport questionnaire-2 in a sample of female athletes. *Journal of Sports Sciences, 18,* 275-290. doi:10.1080/026404100365018

Newton, M., Fry, M., Watson, D., Gano-Overway, L., Mi-Sook, K., Magyar, M., et al. (2007). Psychometric properties of the caring climate scale in a physical activity setting. *Revisa de Psicologia del Deporte, 16*(1), 67-84.

Newton, M., Watson, D. L., Gano-Overway, L., Fry, M., Mi-Sook, K., & Magyar, M. (2007). The role of a caring-based intervention in a physical activity setting. *The Urban Review, 39*(3), 281-299. doi:10.1007/s11256-007-0065-7

Nicholls, J. G. (1978). The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability. *Child Development, 49*(3), 800-814. doi:10.2307/1128250

Nicholls, J.G. (1984) Achievement motivation: Concepts of ability, subjective experience, task choice and performance. *Psychological Review,* 91, 328-348.

Nicholls, J.G. (1989). *The competitive ethos and democratic education.* Cambridge, MA: Harvard University Press.

Noddings, N. (1984). *Caring: A feminine approach to ethics and moral education*. Berkeley: University of California Press.

Noddings, N. (1992). *The challenge to care in schools: An alternative approach to education*. NY: Teachers College Press.

Noddings, N. (1995). Teaching themes of care. *Phi Delta Kappan, 76,* 675-679.

Norcross, J.C., Guadagnoli, E., & Prochaska, J.O. (1984). Factor structure of the profile of mood states (POMS): Two partial replications. *Journal of Clinical Psychology, 40,* 1270-1277.

Ntoumanis, N. (2001). A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology*, *71*(2), 225-242. doi:10.1348/000709901158497

Ommundsen, Y., Roberts, G. C., Lemyre, P. N., & Treasure, D. (2004). Perceived motivational climate in male youth soccer: Relations to social-moral functioning, sportspersonship and team norm perceptions. . *Psychology of Sport and Exercise, 5*, 397-413.

Papaioannou, A. (1995). Differential perceptual and motivational patterns when different goals are adopted. *Journal of Sport and Exercise Psychology,* 17, 18-34.

Papaioannou, A., Bebetsos, E., Theodorakis, Y., Christodoulidis, T., & Kouli, O. (2006). Causal relationships of sport and exercise involvement with goal orientations, perceived competence and intrinsic motivation in physical education: A longitudinal study. *Journal of Sports Sciences, 24*(4), 367-382. doi:10.1080/02640410400022060

Papaioannou, A., Marsh, H. W., & Theodorakis, Y. (2004). A Multilevel Approach to Motivational Climate in Physical Education and Sport Settings: An Individual or a Group Level Construct? *Journal of Sport & Exercise Psychology, 26*(1), 90-119.

Parish, L. E., & Treasure, D. C. (2003). Physical activity and situational motivation in physical education: Influence of the motivational climate and perceived ability. *Research Quarterly for Exercise and Sport, 74*, 173-182.

Pelletier, L. G., Fortier, M. S., Vallerand, R. J., & Briere, N. M. (2001). Associations among perceived autonomy support, forms of self-regulation, and persistence: A prospective study. *Motivation and Emotion, 25*, 279-306. doi:10.1023/A:1014805132406

Pensgaard, A. M., & Roberts, G. C. (2002). Elite athletes' experiences of the motivational climate: The coach matters. *Scandinavian Journal of Medicine & Science in Sports, 12*, 54-59. doi:10.1034/j.1600-0838.2002.120110.x

Raedeke, T.D. (2007). The relationship between enjoyment and affective responses to exercise. *Journal of Applied Sport Psychology, 19*, 105-115.

Rawsthorne, L. J., & Elliot, A. (1999). Achievement goals and intrinsic motivation: A meta-analytic review. *Personality and Social Psychology Review, 3*, 326-344. doi:10.1207/s15327957pspr0304_3

Reeve, J. (2002). Self-determination theory applied to educational settings. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 183-203). Rochester, NY:

University of Rochester Press.

Reinboth, M., & Duda, J. L. (2004). The Motivational Climate, Perceived Ability and Athletes' Psychological and Physical Well-being. *the Sport Psychologist, 18*, 237-251.

Reinboth, M., & Duda, J. L. (2006). Perceived Motivational Climate, Need Satisfaction and Indices of Well-being in team sports: A Longitudinal Perspective. *Psychology of Sport and Exercise, 7*, 269-286. doi:10.1016/j.psychsport.2005.06.002

Roberts, G. C. (2001). Understanding the dynamics of motivation in physical activity: The influence of achievement goals on motivational processes. In G. C. Roberts (Ed.), *Advances in Motivation in Sport and Exercise*. Champaign, IL: Human Kinetics.

Ryan, R.M. (1970). *Intentional behavior.* New York: Ronald Press.

Ryan, R.M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality, 63*(3), 397-427. doi:10.1111/j.1467-6494.1995.tb00501.x

Ryan, R. M. (1993). Agency and organization: Intrinsic motivation, autonomy and the self in psychological development. In J. Jacobs (Ed.), *Nebraska symposium on motivation: Developmental perspectives on motivation* (Vol. 40, pp. 1-56). Lincoln, NE: University of Nebraska Press.

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting to two domains. *Journal of Personality and Social Psychology, 57*, 749-761. doi:10.1037/0022-3514.57.5.749

Ryan, R.M. & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist, 55,* 68-78. doi:10.1037/0003-066X.55.1.68

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on

hedonic and eudemonic well-being. *Annual Review of Psychology, 52,* 141-166.

Ryan, R.M., Frederick, C.M., Lepes, D., Rubio, N., & Sheldon, K.M. (1997). Intrinsic motivation and exercise adherence. *International Journal of Sport Psychology, 28*(4), 335-354.

Ryan, R. M., Vallerand, R. J., & Deci, E. L. (1984). Intrinsic motivation in sport: A cognitive evaluation theory interpretation. In W. F. Straub & J. M. Williams (Eds.), *Cognitive Sport Psychology* (pp. 231-242). New York: Sport Science Associates.

Sapkota, S., Bowles, M., Ham, S., & HW, K. (2005). Adult participation in recommended levels of physical activity- United States, 2001 and 2003. *Morbidity & Mortality Weekly Report, 54,* 1208-1212.

Sarrazin, P., Vallerand, R. J., Guillet, E., Pelletier, I. G., & Cury, F. (2002). Motivation and dropout in female handballers: A 21-month prospective study. *European Journal of Social Psychology, 32,* 395-418. doi:10.1002/ejsp.98

Schutzer, K.A. & Graves, B.S. (2003). Barriers and motivations to exercise in older adults. *Preventive Medicine, 39* (5), 1056-1061. doi:10.1016/j.ypmed.2004.04.003

Seifriz, J. J., Duda, J. L., & Chi, L. (1992). The Relationship of Perceived Motivational Climate to Intrinsic Motivation and Beliefs about Success in Basketball. *Journal of Sport and Exercise Psychology, 14,* 375-391.

Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology, 80,* 325-339. doi:10.1037/0022-3514.80.2.325

Sheldon, K., Ryan, R. M., Deci, E. L., & Kasser, T. (2004). The independent effects of goal contents and motives on well-being: It's both what you pursue and why you pursue it.

Personality and Social Psychology Bulletin, 30, 475-486.

Sheldon, K. M., Williams, G. C., & Joiner, T. (2003). *Self-determination theory in the clinic: Motivating physical and mental health*. New Haven, CT: Yale University Press.

Smith, S. L., Fry, M. D., Ethington, C. A., & Li, Y. (2005). The effect of female athletes' perceptions of their coaches' behaviors on their perceptions of the motivational climate. *Journal of Applied Social Psychology, 17*, 170-177. doi:10.1080/10413200590932470

Solmon, M.A. (1996). Impact of motivational climate in students' behaviors and perceptions in a physical education setting. *Journal of Educational Psychology, 88,* 731-738. doi:10.1037/0022-0663.88.4.731

Sparling, P. B., & Snow, T. K. (2002). Physical activity patterns in recent college alumni. *Research Quarterly for Exercise and Sport, 73,* 200-205.

Standage, M., Duda, J. L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. *Journal of Educational Psychology, 95*, 97-110. doi:10.1037/0022-0663.95.1.97

Standage, M., Duda, J. L., & Ntoumanis, N. (2005). A test of self-determination theory in school physical education. *British Journal of Educational Psychology, 75,* 411-433. doi:10.1348/000709904X22359

Standage, M., & Treasure, D. C. (2002). Relationship among achievement goal orientations and multidimensional situational motivation in physical education. *British Journal of Educational Psychology, 72,* 87-103.

Steinberg, H., Nicholls, B. R., Skyes, E. A., LeBoutillier, N., Ramlakhan, N., Moss, T. P., et al. (1998). Weekly exercise consistently reinstates positive mood. *European Psychologist, 3*,

271-280. doi:10.1027/1016-9040.3.4.271

Thogersen-Ntoumanis, C., & Ntoumanis, N. (2006). The role of self-determined motivation in the understanding of exercise-related behaviours, cognitions and physical self-evaluations. *Journal of Sports Sciences, 24*, 393-404. doi:10.1080/02640410500131670

Thogersen-Ntoumanis, C., & Ntoumanis, N. (2007). A Self-Determined Theory approach to the study of body image concerns, self-presentation and self-perceptions in a sample of aerobic instructors. *Journal of Health Psychology, 12*, 301-315. doi:10.1177/1359105307074267

Treasure, D. C., & Roberts, G. C. (2001). Students' perceptions of the motivational climate, achievement beliefs and satisfaction in physical education. *Research Quarterly for Exercise and Sport, 72*(2), 165-175.

Usala, P., & Hertzog, C. (1989). Measurement of Affective States in Adults: Evaluation of an Adjective Rating Scale Instrument. *Research on Aging, 11*(4), 403-426. doi:10.1177/0164027589114001

U.S. Department of Health and Human Services. (2003). *Physical activity and health: A report of the Surgeon General*. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center National Center for Chronic Disease Prevention and Health Promotion.

US Department of Health and Human Services. (2007). *U.S. Obesity Trends 1985–2006.* Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. Accessed June 25, 2008, http://www.cdc.gov/nccdphp/dnpa/obesity/trend/maps/index.htm

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 271-360). Sand Diego: Academic Press.

Vallerand, R. J. (2001). A hierarchical model of intrinsic and extrinsic motivation in sport and exercise. In G. C. Roberts (Ed.), *Advances in Motivation in Sport and Exercise* (pp. 263-320). Champaign, IL: Human Kinetics.

Vallerand, R.J., & Fortier, M.S. (1998). Measures of intrinsic and extrinsic motivation in sport and physical activity: A review and critique. In J.L. Duda (Ed.), *Advances in sport and exercise psychology measurement.* (pp.81-101) Morgantown, WV: Fitness Information Technology.

Vallerand, R. J., & Losier, G. t. F. (1999). An integrative analysis of intrinsic and extrinsic motivation in sport. *Journal of Applied Sport Psychology*, *11*(1), 142 - 169. doi:10.1080/10413209908402956

Vallerand, R. J., Pelletier, I. G., Blais, M. R., Briere, N. M., Senecal, C., & Vallieres, E. F. (1992). The academic motivation scale: A measure of intrinsic, extrinsic and amotivation in education. *Educational and Psychological Measurement, 52,* 1003-1017.

Vansteenkiste, M., Simons, J., Lens, W., & Sheldon, K. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology, 87*, 246-260. doi:10.1037/0022-3514.87.2.246

Vansteenkiste, M., Simons, J., Soenens, B., & Lens, W. (2004). How to become a persevering exerciser? Providing a clear, future intrinsic goal in an autonomy supportive way. *Journal of Sport & Exercise Psychology, 26*, 232-249.

Vazou, S., Ntoumanis, N., & Duda, J. L. (2006). Predicting young athletes' motivational indices as a function of their perceptions of the coach- and peer-created climate. *Psychology of Sport and Exercise, 7*(2), 215-233. doi:10.1016/j.psychsport.2005.08.007

Vlachopoulos, S. P., Karageorghis, C. I., & Terry, P. C. (2000). Motivation profiles in sport: A Self-Determination Theory perspective. *Research Quarterly for Exercise and Sport, 71*, 387-397.

Vlachopoulos, S. P., & Michailidou, S. (2006). Development and initial validation of a measure of autonomy, competence and relatedness in exercise: The basic psychological needs in exercise scale. *Measurement in Physical Education & Exercise Science, 103*, 179-201. doi:10.1207/s15327841mpee1003_4

Wallace, L. S., Buckworth, S., Kirby, T. E., & Sherman, W. M. (2000). Characteristics of exercise behavior among college students: Application of social cognitive theory to predicting stage of change. *Preventive Medicine, 31*, 494-505. doi:10.1006/pmed.2000.0736

Walling, M. D., & Duda, J. L. (1995). Goals and their associations with beliefs about success in and perceptions of the purposes of physical education. *Journal of Teaching in Physical Education, 14*, 140-156.

Walling, M.D., Duda, J.L. & Chi, L. (1992). The Perceived Motivational Climate in Sport Questionnaire: Construct and predictive validity. *Journal of Sport and Exercise Psychology, 15,* 172-183.

Wang, C. K. J., & Biddle, S. J. H. (2001). Young people's motivational profiles in physical activity: A cluster analysis. *Journal of Sport & Exercise Psychology, 23*(1).

Wang, C. K. J., & Biddle, S. J. H. (2007). Understanding young people's motivation toward

exercise. In M. S. Hagger & N. L. D. Chatzisarantis (Eds.), *Intrinsic Motivation and Self-Determination in Exercise and Sport* (pp. 193-207). Champaign, IL: Human Kinetics.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology, 56*(6), 1063-1070. doi:10.1037/0022-3514.54.6.1063

White, S.A., & Duda, J.L. (1994). The relationship of gender, level of sport involvement, and participation motivation to task and ego orientation. *International Journal of Sport Psychology, 25,* 4-18.

Whitehead, J., Andree, K. V., & Lee, M. J. (1997). Longitudinal interactions between dispositional and situational goals, perceived ability, and intrinsic motivation. In R. Lidor & M. Bar-Eli (Eds.), *Innovations in sport psychology: Linking theory and practice. Proceedings of the IX World Congress in Sport Psychology: Part II* (pp. 750-752). Netanya, Israel: Ministry of Education, Culture and Sport.

Williams, G. C., Deci, E. L., & Ryan, R. M. (1998). Building healthcare partnerships by supporting autonomy; Promoting maintained behavior change and positive health outcomes.

Williams, G. C., Gagne, M., Ryan, R. M., & Deci, E. L. (2002). Facilitating autonomous motivation for smoking cessation. *Health Psychology, 23,* 40-50. doi:10.1037/0278-6133.21.1.40

Wilson, P. M., Mack, D. E., Muon, S., & LeBlank, M. E. (2007). What role does psychological need satisfaction play in motivating exercise participation? In L. A. Chiang (Ed.), *Motivation for exercise and physical activity* (pp. 35-52). Hauppauge, NY: Nova Science.

Wilson, P. M., & Rodgers, W. M. (2002). The relationship between exercise motives and

physical self-esteem in female exercise participants: An application of self-determination theory. *Journal of Applied Biobehavioral Research, 7*, 30-43. doi:10.1111/j.1751-9861.2002.tb00074.x

Wilson, P. M., & Rodgers, W. M. (2004). The relationship between perceived autonomy support, exercise and behavioral intentions in women. *Psychology of Sport and Exercise, 5*(3), 229-242. doi:10.1016/S1469-0292(03)00003-7

Wilson, P. M., & Rodgers, W. M. (2005). Self-Determination Theory, Exercise and Well-being. In M. S. Hagger & N. L. D. Chatzisarantis (Eds.), *Intrinsic Motivation and Self-Determination in Exercise and Sport* (pp. 101-112). Champaign, IL: Human Kinetics.

Wilson, P. M., & Rogers, W. T. (2008). Examining the relationships between perceived psychological need satisfaction and behavioral regulation in exercise. *Journal of Applied Biobehavioral Research, 13*(3), 119-142.

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

Wilson, P.M., Rodgers, W.M., Carpenter, P.J., Hall, C., Hardy, J., & Fraser, S.N. (2004). The relationship between commitment and exercise behavior. *Psychology of Sport and Exercise, 5*, 405-421. doi:10.1016/S1469-0292(03)00035-9

Wilson, P. M., Rodgers, W. M., & Fraser, S. N. (2002). Examining the psychometric properties of the behavioral regulation in exercise questionnaire. *Measurement in Physical Education & Exercise Science, 6*(1), 1-21. doi:10.1207/S15327841MPEE0601_1

Wilson, P. M., Rodgers, W. M., Fraser, S. N., & Murray, T. C. (2004). Relationships

between exercise regulations and motivational consequences in university students. *Research Quarterly for Exercise and Sport, 75,* 81-91.

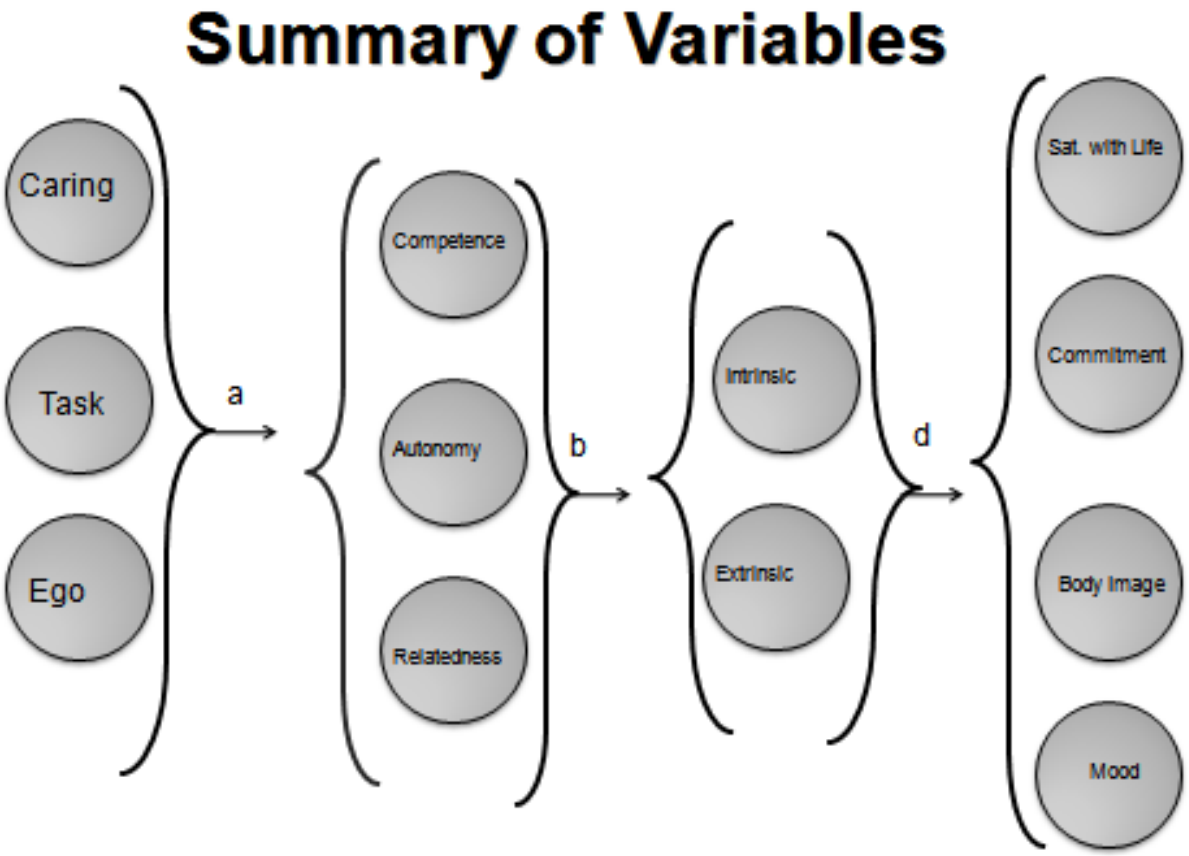
Wilson, P. M., Rodgers, W. M., Loitz, C. C., & Scime, G. (2006). "It's who I am … Really!" The importance to integrated regulation in exercise contexts. *Journal of Applied Biobehavioral Research, 11*(2), 79-104. http://dx.doi.org/10.1111/j.1751-9861.2006.tb00021.x

Wilson, P. M., Rogers, W. T., Rodgers, W. M., & Wild, T. C. (2006). The Psychological Need Satisfaction in Exercise Scale. *Journal of Sport & Exercise Psychology, 28*(3), 231-251.

Yaguchi, K., Otsuka, T., Fujita, T., & Hatano, S. (1987). The relationship between emotional status and physical activities of the Japanese elderly. *Journal of Human Development, 23,* 42-47.

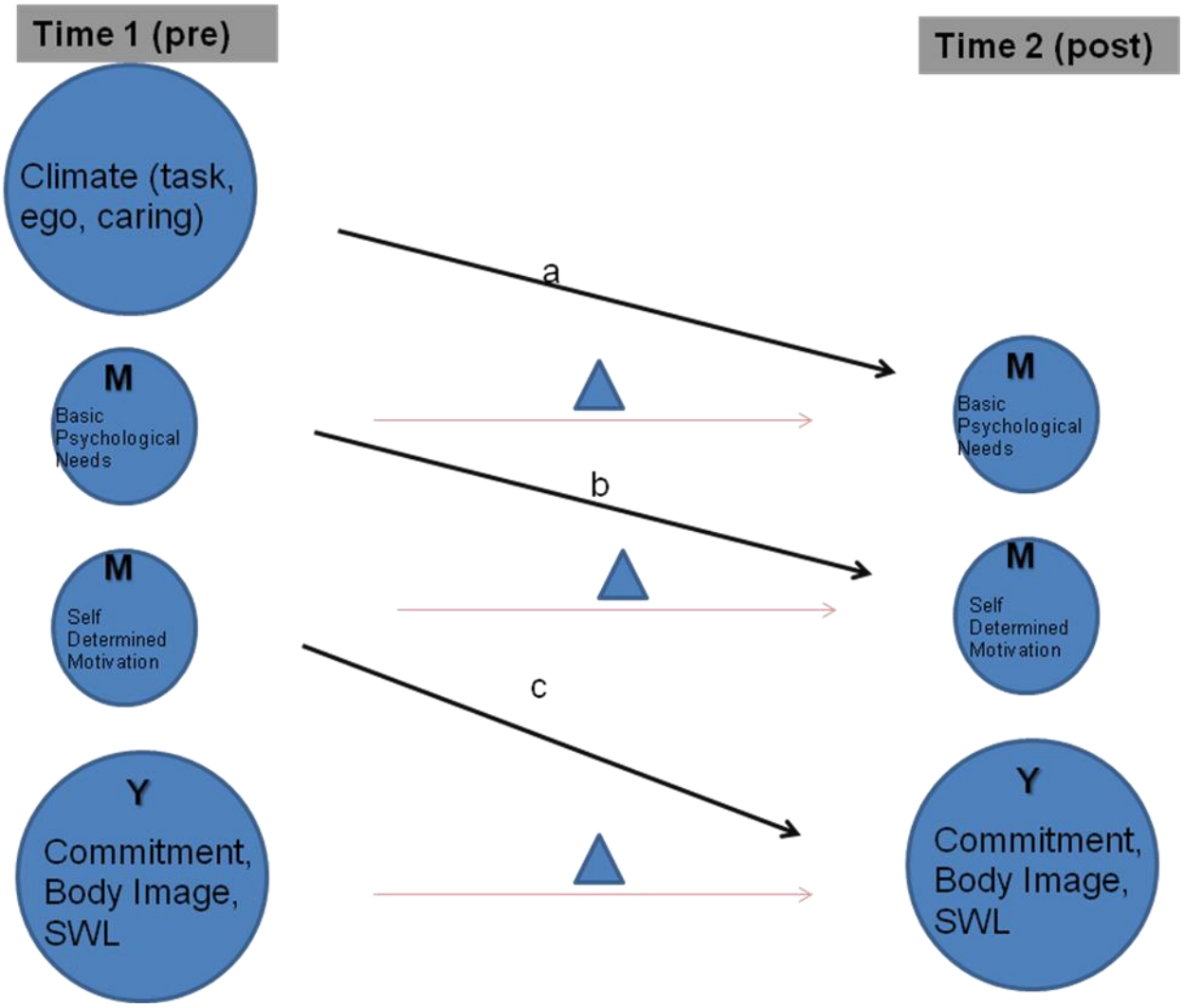
APPENDIX C:

PROPOSED OVERALL MODEL


Summary of Variables
Caring
Task
Ego
a
Competence
Autonomy
Relatedness
b
Intrinsic
Extrinsic
d
Sat. with Life
Commitment
Body Image
Mood

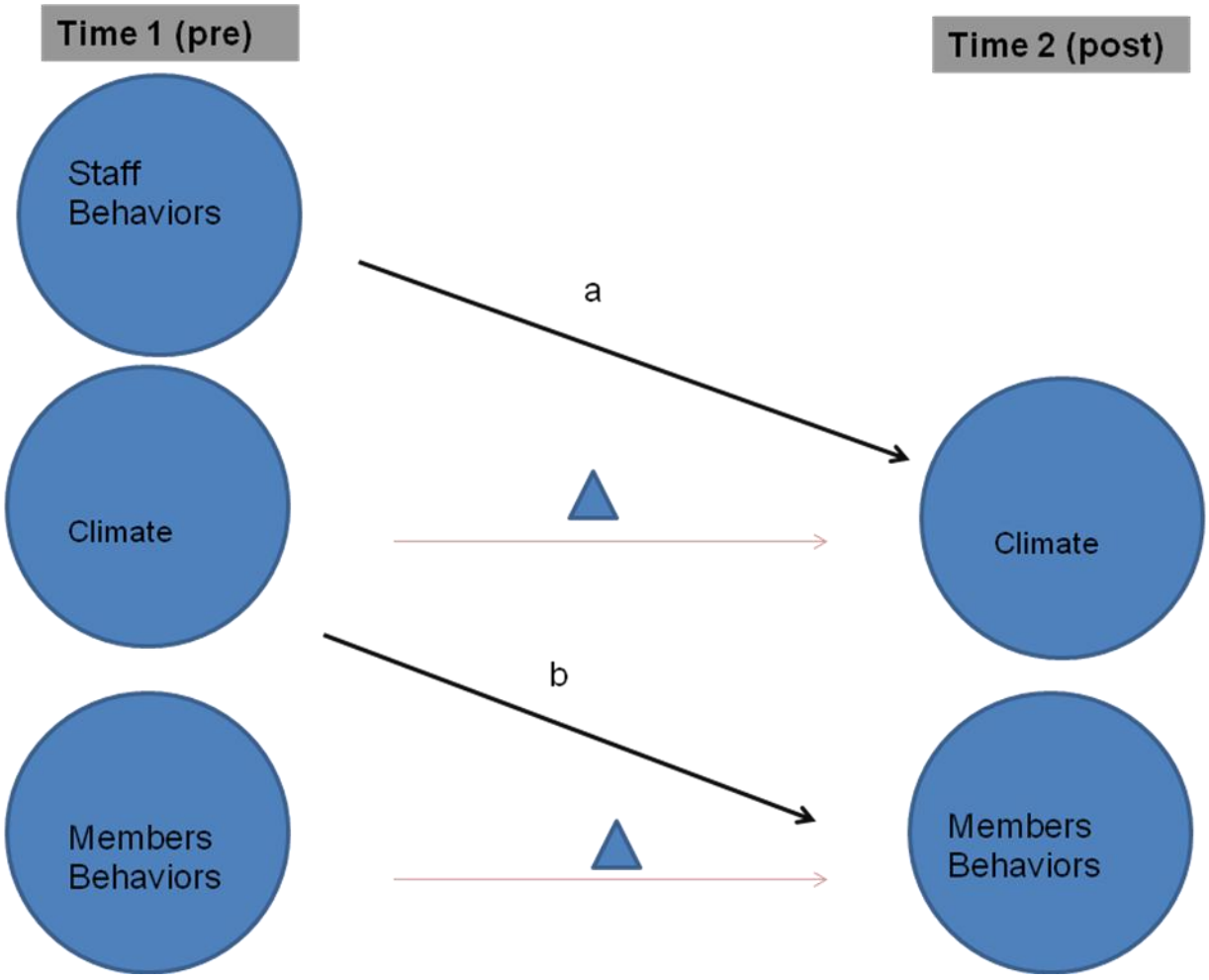
APPENDIX D:

PROPOSED MEDIATION MODEL, STUDY 2


Time 1 (pre)
Time 2 (post)
Climate (task, ego, caring)
a
M
Basic Psychological Needs
M
Basic Psychological Needs
b
M
Self Determined Motivation
M
Self Determined Motivation
c
Y
Commitment, Body Image, SWL
Y
Commitment, Body Image, SWL

APPENDIX E:

PROPOSED SPECIFIC BEHAVIORS MODEL, STUDY 3


Time 1 (pre)
Time 2 (post)
Staff Behaviors
Climate
Members Behaviors
a
b
Climate
Members Behaviors

APPENDIX F:

QUESTIONNAIRE

Name:_____

Email:_____

Phone: _____

Read each statement and think about how much you believe the statement describes your thoughts and feelings <u>regarding exercise</u>. Then choose the answer that shows how much you agree or disagree with each statement.					
1. How dedicated are you to exercise?	**Not At All** **1**	**Not Much** **2**	**Not Sure** **3**	**Dedicated** **4**	**Very Dedicated** **5**
2. How determined are you to keep exercising?	**Not At All** **1**	**Not Much** **2**	**Not Sure** **3**	**Dedicated** **4**	**Very Dedicated** **5**
3. How hard would it be for you to quit exercising?	**Not At All** **1**	**A Little** **2**	**Not Sure** **3**	**Hard** **4**	**Very Hard** **5**
4. What would you be willing to do to keep participating in exercise?	**Nothing** **1**	**Not Much** **2**	**Not Sure** **3**	**A Lot** **4**	**Anything** **5**

Below are five statements you may agree or disagree with. Using the 1-7 scale below indicate your agreement with each item by circling the item. Please be open and honest in your response.	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree or Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1. In most ways my life is close to ideal.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2. The conditions of my life are excellent.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3. I am satisfied with my life.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4. So far I have gotten the important things I want in life.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5. If I could live my life over, I would change almost nothing.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

More on back page

We are interested in the reasons underlying peoples' decisions to engage, or not engage in physical exercise. Using the scale below, please indicate to what extent each of the following items is true for you. Please note that there are no right or wrong answers and no trick questions. We simply want to know how you personally feel about exercise. Your responses will be held in confidence and only used for our research purposes.					
	Not True For Me		**Sometimes True For Me**		**Very True For Me**
1. I exercise because other people say I should.	**1**	**2**	**3**	**4**	**5**
2. I feel guilty when I don't exercise.	**1**	**2**	**3**	**4**	**5**
3. I value the benefits of exercise.	**1**	**2**	**3**	**4**	**5**
4. I exercise because it's fun.	**1**	**2**	**3**	**4**	**5**
5. I exercise because it is consistent with my life goals.	**1**	**2**	**3**	**4**	**5**
6. I take part in exercise because my friends/family/partner say I should.	**1**	**2**	**3**	**4**	**5**
7. I feel ashamed when I miss an exercise session.	**1**	**2**	**3**	**4**	**5**
8. It's important to me to exercise regularly.	**1**	**2**	**3**	**4**	**5**
9. I enjoy my exercise sessions.	**1**	**2**	**3**	**4**	**5**
10. I consider exercise to be part of my identity.	**1**	**2**	**3**	**4**	**5**
11. I exercise because others will not be pleased with me if I don't.	**1**	**2**	**3**	**4**	**5**
12. I feel like a failure when I haven't exercised for awhile.	**1**	**2**	**3**	**4**	**5**
13. I think it is important to make the effort to exercise regularly.	**1**	**2**	**3**	**4**	**5**
14. I find exercise a pleasurable activity.	**1**	**2**	**3**	**4**	**5**
15. I consider exercise a fundamental part of who I am.	**1**	**2**	**3**	**4**	**5**
16. I feel pressure from my friends/family to exercise.	**1**	**2**	**3**	**4**	**5**
17. I get restless if I don't exercise regularly.	**1**	**2**	**3**	**4**	**5**
18. I get pleasure and satisfaction from participating in exercise.	**1**	**2**	**3**	**4**	**5**
19. I consider exercise consistent with my values.	**1**	**2**	**3**	**4**	**5**

For each of the items below, check the box beside the one statement that best describes how you feel RIGHT NOW AT THIS VERY MOMENT. Read the items carefully to be sure the statement you choose accurately and honesty describes how you feel right now.	**Extremely Dissatisfied**	**Mostly Dissatisifed**	**Moderately Dissatisfied**	**Slightly Dissatisfied**	**Neither Dissatisfied nor Satisfied**	**Slightly Satisfied**	**Moderately Satisfied**	**Mostly Satisfied**	**Extremely Satisfied**
1. My physical appearance.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
2. My body size and shape.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
3. My weight.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
4. My physical attractiveness.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

For the #5 and #6, choose the best answer	A great deal better	Much Worse	Somewhat Worse	Just slightly worse	About the same	Just slightly better	Somewhat better	Much better	A great deal better
5. Right now, I feel _____ about my looks than I usually feel.	1	2	3	4	5	6	7	8	9
6. Right now, I feel that I look _____ than the average person looks.	1	2	3	4	5	6	7	8	9

Read each statement and think about how much you believe the statement describes the **Ambler Student Recreation Fitness Center (the Rec). Then choose that answer that shows how much you agree or disagree with each statement.**	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1) At the rec, students are treated with respect.	1	2	3	4	5
2) At the rec , the staff respect students.	1	2	3	4	5
3) At the rec , the staff are kind to students.	1	2	3	4	5
4) At the rec , the staff care about students.	1	2	3	4	5
5) At the rec , students feel that they are treated fairly.	1	2	3	4	5
6) At the rec , the staff try to help students.	1	2	3	4	5
7) At the rec , the staff want to get to know all the students.	1	2	3	4	5
8) At the rec , the staff listen to students.	1	2	3	4	5
9) At the rec , everyone likes students for who they are.	1	2	3	4	5
10) At the rec , the staff accept students for who they are.	1	2	3	4	5
11) At the rec , students feel comfortable.	1	2	3	4	5
12) At the rec , students feel safe.	1	2	3	4	5
13) At the rec , students feel welcome every day.	1	2	3	4	5

During a typical 7-Day period (a week), how many times on the average do you do the following kinds of exercise for more than 20 minutes during your free time (write on each line the appropriate number).

Times Per Week

A) Strenuous Exercise (Heart beats rapidly) _____
(e.g. running, jogging, soccer, basketball, cycling, aerobics, heavy lifting)

B) Moderate Exercise (Not Exhausting) _____
(e.g. fast walking, easy cycling, volleyball, bicycling, circuit training)

C) Mild Exercise (Minimal Effort) _____
(e.g. yoga, easy walking, light weight lifting, stretching)

More on back page

The following statements represent different feelings people have when they exercise. Please answer the following questions by considering how you typically feel while you are exercising at the <u>Ambler Student Recreation Fitness Center</u>.	**False**				**True**
1. I feel that I am able to complete exercises that are personally challenging.	1	2	3	4	5
2. I feel free to exercise in my own way.	1	2	3	4	5
3. I feel attached to my exercise companions (i.e. other rec members) because they accept me for who I am.	1	2	3	4	5
4. I feel confident I can do even the most challenging exercises.	1	2	3	4	5
5. I feel free to make my own exercise program decisions.	1	2	3	4	5
6. I feel like I share a common bond with people who are important to me when we exercise together.	1	2	3	4	5
7. I feel confident in my ability to perform exercises that personally challenge me.	1	2	3	4	5
8. I feel like I have a say in choosing the exercises that I do.	1	2	3	4	5
9. I feel a sense of camaraderie with my exercise companions (i.e. other rec members) because we exercise for the same reasons.	1	2	3	4	5
10. I feel capable of competing exercises that are challenging to me.	1	2	3	4	5
11. I feel like I am in charge of my exercise program decisions.	1	2	3	4	5
12. I feel close to my exercise companions (i.e. other rec members) who appreciate how difficult exercise can be.	1	2	3	4	5
13. I feel like I am capable of doing even the most challenging exercises.	1	2	3	4	5
14. I feel free to choose which exercises I participate in.	1	2	3	4	5
15. I feel connected to the people who I interact with while we exercise together (i.e. other rec members).	1	2	3	4	5
16. I feel good about the way I am able to complete challenging exercises.	1	2	3	4	5
17. I feel like I am the one who decides what exercises I do.	1	2	3	4	5
18. I feel like I get along well with other people who I interact with while we exercise together (i.e. other rec members).	1	2	3	4	5

More on next page

Read each statement and think about how much you believe the statement describes the <u>Ambler Student Recreation Fitness Center (The rec)</u>. Then choose that answer that shows how much you agree or disagree with each statement. When at the rec, I feel the staff. . .	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
1) makes an attempt to know my name.	1	2	3	4	5
2) recognizes me.	1	2	3	4	5
3) introduces me to other members when appropriate.	1	2	3	4	5
4) is available when I need them.	1	2	3	4	5
5) has a positive attitude towards me.	1	2	3	4	5
6) is helpful.	1	2	3	4	5
7) greets me warmly when I walk in the door.	1	2	3	4	5
8) encourages me to try my best.	1	2	3	4	5
9) seems happy I use the rec.	1	2	3	4	5
10) encourages me to strive towards my fitness/health goals.	1	2	3	4	5
11) is friendly towards me.	1	2	3	4	5
12) makes eye contact with me.	1	2	3	4	5
13) notices improvements I've made.	1	2	3	4	5
14) loves their job.	1	2	3	4	5
15) wants to be working there.	1	2	3	4	5
16) makes me feel welcome.	1	2	3	4	5
17) talks/interacts with me.	1	2	3	4	5

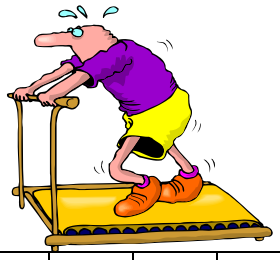
Instructions: Below is a list of common human emotions. For each emotion, circle the response that best indicates how accurately that emotion describes you <u>over the past two weeks</u>. Describe yourself as you are generally or typically, as compared with other persons you know of the same sex and roughly the same age. ***For each emotion, circle the number that best indicates how accurately that emotion describes you as you <u>typically</u> have been over the past 2 weeks. Choose from the following:***

1=Not at All Accurate 2=A Little Accurate 3=Moderately Accurate 4=Quite a Bit Accurate 5=Extremely Accurate

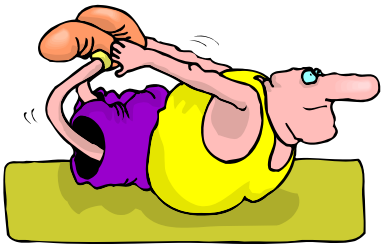
sluggish	**1**	**2**	**3**	**4**	**5**	**sad**	**1**	**2**	**3**	**4**	**5**
happy	**1**	**2**	**3**	**4**	**5**	**frightened**	**1**	**2**	**3**	**4**	**5**
hostile	**1**	**2**	**3**	**4**	**5**	**sleepy**	**1**	**2**	**3**	**4**	**5**
at ease	**1**	**2**	**3**	**4**	**5**	**calm**	**1**	**2**	**3**	**4**	**5**
unhappy	**1**	**2**	**3**	**4**	**5**	**afraid**	**1**	**2**	**3**	**4**	**5**
full of pep	**1**	**2**	**3**	**4**	**5**	**angry**	**1**	**2**	**3**	**4**	**5**
fearful	**1**	**2**	**3**	**4**	**5**	**lively**	**1**	**2**	**3**	**4**	**5**
tired	**1**	**2**	**3**	**4**	**5**	**tense**	**1**	**2**	**3**	**4**	**5**
on edge	**1**	**2**	**3**	**4**	**5**	**cheerful**	**1**	**2**	**3**	**4**	**5**
energetic	**1**	**2**	**3**	**4**	**5**	**fatigued**	**1**	**2**	**3**	**4**	**5**
depressed	**1**	**2**	**3**	**4**	**5**	**relaxed**	**1**	**2**	**3**	**4**	**5**

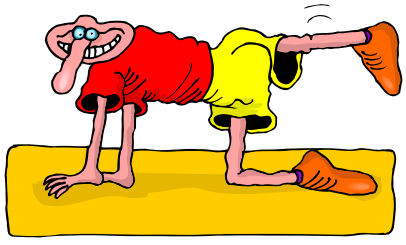
nervous	**1**	**2**	**3**	**4**	**5**
pleased	**1**	**2**	**3**	**4**	**5**
delighted	**1**	**2**	**3**	**4**	**5**
enthusiastic	**1**	**2**	**3**	**4**	**5**
proud	**1**	**2**	**3**	**4**	**5**
confident	**1**	**2**	**3**	**4**	**5**
daring	**1**	**2**	**3**	**4**	**5**
alert	**1**	**2**	**3**	**4**	**5**
ncentrating	**1**	**2**	**3**	**4**	**5**

resentful	**1**	**2**	**3**	**4**	**5**
joyful	**1**	**2**	**3**	**4**	**5**
excited	**1**	**2**	**3**	**4**	**5**
strong	**1**	**2**	**3**	**4**	**5**
bold	**1**	**2**	**3**	**4**	**5**
fearless	**1**	**2**	**3**	**4**	**5**
attentive	**1**	**2**	**3**	**4**	**5**
determined	**1**	**2**	**3**	**4**	**5**



Read ach statement and think about how much you believe the statement describes your behaviors at the Ambler Student Recreation Fitness Center. Then choose the answer that shows how much you agree or disagree with each statement. When at the rec, I. . .	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
1) say hello to people I recognize.	1	2	3	4	5
2) introduce myself to other members I do not know, when given the opportunity.	1	2	3	4	5
3) politely wait my turn for a machine.	1	2	3	4	5
4) do not go over my allotted time limit on the equipment.	1	2	3	4	5
5) follow the rules.	1	2	3	4	5
6) am friendly to other members.	1	2	3	4	5
7) support other members' efforts.	1	2	3	4	5
4) am friendly to other staff.	1	2	3	4	5
5) make eye contact with other members/staff.	1	2	3	4	5
6) put my towel in the proper place when I am finished.	1	2	3	4	5
7) wipe the machines after I am done.	1	2	3	4	5
8) do not spit in the water fountains.	1	2	3	4	5
9) return the weights to the proper location.	1	2	3	4	5
10) follow the guidelines posted for proper equipment usage.	1	2	3	4	5





Read each statement and think about how much you believe the statement describes the environment in <u>the Ambler Student Recreation Fitness Center</u> <u>(The rec)</u>. Then choose the answer that shows how much you agree or disagree with each statement.	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
1. At the rec, the staff encourages students to try new skills.	1	2	3	4	5
2. At the rec, students are hesitant/embarrassed to ask the instructor/staff or other students for help.	1	2	3	4	5
3. At the rec, the instructor/staff gives most of his/her attention to only a few students (high status, most fit, etc…).	1	2	3	4	5
4. At the rec, some students are not made to feel welcome.	**1**	**2**	**3**	**4**	**5**
5. At the rec, students of all fitness levels are made to feel valued.	1	2	3	4	5
6. At the rec, the instructor/staff praises students only when they do better than other students.	**1**	**2**	**3**	**4**	**5**
7. At the rec, students feel embarrassed if they don't know how to use the equipment or perform the exercise/skill/drill.	1	2	3	4	5
8. At the rec, students feel good when they try their best.	1	2	3	4	5
9. At the rec, students feel confident asking for help.	1	2	3	4	5
10. At the rec, all students feel welcome.	1	2	3	4	5
11. At the rec, students help each other learn.	1	2	3	4	5
12. At the rec, students are encouraged to do better than other students.	1	2	3	4	5
13. At the rec, the instructors/staff has their favorite students.	**1**	**2**	**3**	**4**	**5**
14. At the rec, the instructor/staff encourages students to improve on skills they are not good at.	**1**	**2**	**3**	**4**	**5**
15. At the rec, students feel confident when asking others how to use the equipment or perform an exercise/skill.	**1**	**2**	**3**	**4**	**5**
16. At the rec, students feel successful when they improve.	1	2	3	4	5
17. At the rec, only a few students (high status, most fit, etc…) get praised.	1	2	3	4	5
18. At the rec, students feel they must be the best in order to feel valued.	1	2	3	4	5
19. At the rec, trying hard is rewarded.	**1**	**2**	**3**	**4**	**5**
20. At the rec, the instructors/staff encourages students to help each other.	1	2	3	4	5
21. At the rec, the instructors/staff make it clear who they think are the most fit and/or skilled students.	1	2	3	4	5
22. At the rec, students are excited when they do better than their fellow classmates.	1	2	3	4	5
23. Only fit/skilled students utilize the rec.	1	2	3	4	5

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
24. At the rec, the instructor/staff emphasizes always trying your best.	1	2	3	4	5
25. At the rec, only a few students (high status, most fit, etc…) get noticed by the instructors/staff.	**1**	**2**	**3**	**4**	**5**
26. At the rec, students are afraid to make mistakes.	1	2	3	4	5
27. At the rec, students are encouraged to work on their weaknesses.	1	2	3	4	5
28. At the rec, the instructors/staff favors some students over others.	1	2	3	4	5
29. At the rec, the focus is to keep improving on each exercise/skill each session.	1	2	3	4	5
30. At the rec, students really "work together" as a team.	**1**	**2**	**3**	**4**	**5**
31. At the rec, students help each other to get better and excel.	1	2	3	4	5

Please provide the following information:

1. Gender (circle one): Male Female **2. Age:** _____ **3. GPA:** _____

4. KU Athlete? Yes N o **5. Height:** _____(ft & inches) **6. Weight:** _____(pounds)

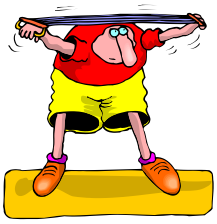
7. Grade (circle one): Freshmen Sophomore Junior Senior Graduate Other

8. Race (circle one): African American/Black White/Caucasian Mixed Asian/Pacific Islander Hispanic/Latina Native American Other_____

9. Although you may engage in a variety of activities, try to give the answer that best describes your TYPICAL reason for visiting the rec (choose all that apply)? I mainly . . .

- ○ take classes.
- ○ use the equipment (i.e., cardio, weights, nautilus, track).
- ○ use the climbing wall.
- ○ use the basketball courts.
- ○ participate in intramurals.
- ○ engage in recreational activities (i.e., ping pong, badmitton, racquetball, walleyball, etc)
- ○ am involved in club sport practices.
- ○

10. Since August 14, 2009 (start of the Fall semester), how many times (total) would you estimate you've visited the rec? _____



Thank you!

APPENDIX G:

IRB APPROVAL

Students' Perceptions of the Student Recreation Center: Current Users

INTRODUCTION

The Department of Health, Sport and Exercise Science at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of this study is to examine students' perceptions of the climate at the student recreation center.

PROCEDURES

Current student users of the Ambler Student Recreation Fitness Center will be invited to complete a pre and post survey to measure their perceptions of the positive and supportive environment at the recreation center setting as well as variables addressing their motivation to exercise, commitment to exercise and psychological well-being (i.e. body image and satisfaction with life). In addition, the researchers seek permission to access both your University of Kansas GPA and number of visits to the Watkins Student Health Center. Both the pre and the post survey will take approximately 20 minutes to complete, respectively. To explore the relationship between exercise, health, and academic achievement, students may also give the researchers permission to access their health and academic records for a period of one year.

RISKS

Participation in this study simply involves completing the pre and post surveys, and brings no foreseeable risks beyond those of daily life.

BENEFITS

This study is being conducted because the Director is interested in maximizing members' experiences at the student recreation center. The members will benefit from a more caring, supportive environment at the student recreation center.

PAYMENT TO PARTICIPANTS

Participants who complete both the pre- and post-survey will be given a small token gift such as a granola bar (pre survey) and water bottle (post survey).

PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any way with the information collected about you or with the research findings from this study. The researchers will not share information about you unless required by law or unless you give written permission. Once the pre and post surveys are matched, the researcher(s) will use a study number instead of your name to identify your surveys. All contact information will be stored in a secure area. Please note that for students who choose to complete the survey on line, it is possible with internet communications, that through intent or accident, someone other than the intended recipient may see your response.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about you, in writing, at any time, by sending your written request to: Mary Fry, 1301 Sunnyside Ave, 161 Robinson, Lawrence, KS 66045. If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION should be directed to:

Theresa Brown
Principal Investigator
1301 Sunnyside Ave
308b Robinson
University of Kansas
Lawrence, KS 66045
785 864 7055

Mary Fry, PhD
Faculty Supervisor
1301 Sunnyside Ave
161 Robinson
University of Kansas
Lawrence, KS 66045
785 864 7055

If you have any questions about your rights as a research participant you may contact the Human Subjects Committee Lawrence Campus (HSCL) office at 864-7429 or 864-7385 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email mdenning@ku.edu.

KEEP THIS SECTION FOR YOUR RECORDS. IF YOU WISH TO PARTICIPATE TEAR OFF THE FOLLOWING SECTION AND RETURN IT TO THE RESEARCHER(S):

Students' Perceptions of the Student Recreation Center: Current Users
(Project/Study Title)

HSCL #_____18428_____ (Provided by HSCL office)

PARTICIPANT CERTIFICATION:

If you agree to participate in this study please sign where indicated, then tear off this section and return it to the investigator(s). Keep the consent information for your records.

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study and the use and disclosure of information about me for the study.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

_____ _____
Type/Print Participant's Name Date

_____
Participant's Signature

Phone number:_____

☐ I give permission to the researchers to access my University of Kansas academic and health records for GPA and frequency of visits to the Watkins Student Wellness Center within the next 12 months from the date I signed this form. (check box if "yes")

1/14/2010

HSCL #18428

Theresa Brown
HSES
308 Robinson Center

The Human Subjects Committee Lawrence Campus (HSCL) has received your response to its expedited review of your research project

18428 Brown/Fry (HSES) Fostering a Caring, Supportive Environment at a Student Recreation Center

and approved this project under the expedited procedure provided in 45 CFR 46.110 (f) (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

The Office for Human Research Protections requires that your consent form must include the note of HSCL approval and expiration date, which has been entered on the consent form(s) sent back to you with this approval.

1. At designated intervals until the project is completed, a Project Status Report must be returned to the HSCL office.
2. Any significant change in the experimental procedure as described should be reviewed by this Committee prior to altering the project.
3. Notify HSCL about any new investigators not named in original application. Note that new investigators must take the online tutorial at http://www.rcr.ku.edu/hscl/hsp_tutorial/000.shtml.
4. Any injury to a subject because of the research procedure must be reported to the Committee immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform HSCL when this project is terminated. You must also provide HSCL with an annual status report to maintain HSCL approval. Unless renewed, approval lapses one year after approval date. If your project receives funding whichequests an annual update approval, you must request this from HSCL one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Mary Denning
Coordinator