The Role of Autonomy in the Relation Between Happiness and Resource Building

by

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Curriculum Vitae

The author was born in Brewster, New York on April 17, 1980. He attended Quinnipiac University from 1998 to 2002, and graduated with a Bachelor of Arts degree in Psychology in 2002. He came to the University of Rochester in the Fall of 2002 and began graduate studies in Psychology. He pursued his research in Social/Personality Psychology under the direction of Professor Miron Zuckerman and received the Master of Arts degree from the University of Rochester in 2005. He will begin his appointment as Assistant Professor of Psychology at Misericordia University in the Fall of 2008.
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Abstract

Happiness has been shown to be related to a myriad of positive outcomes in many areas, including personal relationships, performance, creativity and altruism (Lyubomirksy, King, & Diener, 2005). Such outcomes are viewed as resources that people can use to their advantage and the advantage of others. The Broaden-and-Build Theory (Fredrickson, 1998) explains these findings by proposing that positive emotions lead to a broadening of thought-action repertoires and, hence, the building of resources. This conceptualization does not differentiate between different types of happiness. The current investigation attempted to show that happiness experienced in conjunction with an experience of autonomy (Deci & Ryan, 1985b; Ryan & Deci, 2000) would lead to greater resource building than happiness coupled with a more controlling experience. Pilot Study 1 showed that those high on autonomy had a stronger relationship between happiness and need fulfillment than those low on autonomy. Pilot Study 2 showed that participants high on self-determination had a stronger relationship (compared to those who are low) on eudaemonia and creativity. In contrast, Study 1 failed to show any moderating effect of autonomy on the relationship between happiness and coping. Study 2 showed mixed support for the hypothesis that happiness based on autonomous activities leads to greater performance, perseverance, creativity, and altruism than happiness based on controlled pursuits or neutral affect. Overall, the results suggest that in some contexts, but not in others, autonomous happiness leads to greater resource building than controlled happiness. Future research may attempt to identify when autonomy enhances the resource-building function of happiness.
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Chapter 1: Introduction

What are the outcomes of experiencing happiness? There is extensive literature that links the experience of happiness, concurrently as well as prospectively, to a myriad of other positive outcomes (such as success at work, better relationships, increased creativity, greater performance, better health, and greater altruism; c.f., Lyubomirksy, King, & Diener, 2005). These outcomes can be considered resources since they often are not just a positive experience, but rather are potentials and abilities that can be accessed in the future when they are needed. The Broaden-and-Build Theory of positive emotions (Fredrickson, 1998) offers one explanation for this connection. According to Fredrickson (1998), the experience of positive emotions (such as happiness) leads to the broadening of momentary thought-action repertoires. With this broadened experience, people are more able to learn and explore their environment, which leads to growth and the accrual of resources.

This perspective treats happiness as a unitary construct. No distinction is made regarding the source of happiness. It is believed that happiness from any source will lead to the same accrual of resources. However, there may be certain kinds of happiness that lead to greater resource building. If growth plays an important role in the happiness-resource building connection, it is important to ask which type of happiness experience leads to greater growth.

Self-Determination Theory (SDT; Deci & Ryan, 1985b) can offer one possible answer to this question. According to Self-Determination Theory, growth occurs when people’s basic psychological needs (for competence, autonomy, and relatedness) are fulfilled. Therefore, people who experience a sense of being skilled in some area
(competence), of choice in their pursuits (autonomy), and of having close meaningful relationships (relatedness) will experience greater personal growth than people who do not have these same experiences. Given that happiness is believed to lead to resource building through the experience of growth and need fulfillment leads to greater growth, perhaps happiness that is based on the fulfillment of basic needs will lead to greater resource building than happiness that is not based on the fulfillment of those needs.

The current work explores the possible connection between autonomy and the accrual of resources due to happiness. Specifically, it examines the extent to which autonomous experience moderates the relationship between happiness and a number of positive outcomes (such as improved coping and enhanced performance). Such moderation would explain the why and when of happiness effects and link these effects to need fulfillment. This rationale is developed in three sections below. The first reviews the evidence that links happiness with resource building; the second reviews the benefits of autonomous experience as outlined by SDT; and the third focuses on the possible role of autonomy as a moderator of happiness effects.

Happiness and Resource Building

What are the consequences of experiencing happiness? There is extensive literature addressing this question (c.f, Lyubomirsky et al., 2005), which is reviewed below.

Previous Perspectives on Emotions

Historically, research on the functions of emotions has focused primarily on negative affect (Fredrickson, 2006). There are several reasons for this imbalance. First, negative emotions are more distinct than positive emotions. For example, the experience
of fear is greatly different from the experiences of disgust or sadness. In addition, negative emotions lead to distinct actions. For example, disgust leads one to expel whereas fear encourages escape. In contrast, positive emotions such as joy and contentment are difficult to differentiate and do not lead to noticeably different actions (Fredrickson & Levenson, 1998).

Additionally, some theories of emotions posited that the purpose of an emotional experience is to help the individual prepare a response to an environmental event (Frijda, 1986). Negative emotions are well-suited for this purpose. As mentioned above, each negative emotion allows a person to focus on a given threatening stimulus and encourages the proper response. Positive emotions do not seem to focus attention and do not point to a clear course of action. As such, positive emotions did not fit the prevailing notion of emotions and, consequently, were given less attention in the research.

Finally, there has been a general tendency within psychology as a whole to focus on the problems that people encounter in their lives and what they can do to overcome them (Seligman & Csikszentmihalyi, 2000). People who experience excessive negative emotions are not able to interact effectively with their environment. Accordingly, researchers aimed to identify precursors of negative emotions so as to prevent their occurrence and/or minimize their consequences.

_A New Focus for Emotions Research_

The positive psychology movement (cf. Seligman & Csikszentmihalyi, 2000) questioned some of the above assertions within the field of emotion, particularly the notion that understanding the negative aspects of experience is paramount to helping people lead better lives. Seligman and Csikszentmihalyi (2000) proposed an alternative
view—focusing on those psychological constructs that make a person stronger, not weaker. That is, to understand better the construct of psychological health, it is necessary to focus not only on those areas that are problems but also on those areas that allow a person to function more effectively (see also Ryan & Deci, 2001; Ryff & Singer, 1998; Jahoda, 1958; this view also fits the definition of health proposed by the World Health Organization, 1948). One research tradition that is closely linked to the positive psychology movement examines correlates and consequences of happiness. In general, researchers were able to link happiness (often assessed by measuring positive affect; PA) to a large array of diverse positive outcomes. Some examples are presented below.

**Sociability and prosocial behavior.** Experimental work has shown that PA leads to increased sociability as measured by interest in being with friends, as well as social and leisure activities (Cunningham, 1988b). PA also leads to an increase in self-disclosure (Cunningham, 1988a). In one study (Cunningham, 1988a), participants were induced to experience either PA or negative affect (NA) that were either relevant or non-relevant to the self. Specifically, participants were either given performance feedback (positive or negative; to induce self-relevant affect) or were either shown a positive or negative video clip (to induce non self-relevant affect). After this manipulation, participants engaged in a conversation with a confederate while waiting to begin the next portion of the study. It was found that (regardless of self-relevance) those participants who were in the PA conditions disclosed a greater amount of information about themselves to the confederate than those who were in the NA conditions. This difference in disclosure was even more pronounced for information that was either moderately or highly intimate (as compared to less intimate information as rated by judges).
Harker and Keltner (2001) assessed PA from yearbook photos, using the Facial Activation Coding System (FACS; Ekman & Freisen, 1976; 1978), which allows the quantification of the contractions of the muscles of the face. This measure can be used to assess the extent to which a person portrays emotions such as amusement and enjoyment. They found that people who had more genuine (Duchenne) smiles in their yearbook pictures were more likely to have stronger social connections later in life. Specifically, those who had Duchenne smiles (smiles that include activation of the zygomatic major muscle to upturn the corners of the mouth and contraction of the orbicularis oculi muscle around the eyes to raise the cheeks as well as create crow’s feet and bags under the eyes) in their yearbook were more likely to be married six years later, less likely to be single 22 years later, and showed higher marital satisfaction 31 years later. In addition, a separate set of participants who viewed the yearbook pictures believed interactions with people with Duchenne smiles would be more rewarding than interactions with those lacking such smiles.

PA has been showed to be related to increased prosocial behavior. Participants who were put in a more positive mood were more likely to donate money and to help someone who was having trouble carrying a box (Isen, 1970), more likely to volunteer to donate blood (O’Malley & Andrews, 1983), and more likely to help experimenters prepare materials and participate in uninteresting studies (Aderman, 1972). In addition, Thoits and Hewitt (2001) found that those who were higher on a one-item happiness inventory were more likely to spend time volunteering three years later.

**Conflict resolution.** There is strong experimental evidence that an increase in PA improves one’s ability to deal with conflict. Using a number of mood manipulations,
Baron and colleagues have shown that an increase in participants’ PA leads to a decrease in conflict resolution through avoidance and competition and increase in collaboration (c.f., Baron, 1990; Baron, Fortin, Frei, Hauver, & Shack, 1990; Baron, Rea, Daniels, 1992). Carnevale and Isen (1986) found that a positive-mood induction led to improved negotiations. In this study, PA was induced by having participants sort *BC* and *New Yorker* cartoons while the researchers took five minutes to repair some of their equipment. Participants in the control condition did not engage in the sorting task; they simply waited the five minutes. Participants then engaged in a negotiation as buyers and sellers of goods. Their goal was to maximize their profits. Participants who were in the PA condition came away from the negotiation with more optimal solutions (i.e., solutions that were better for both the buyer and the seller).

*Success at work.* The experience of PA has been shown to predict a number of positive outcomes in one’s career. Staw, Sutton, and Pellend (1994) examined the relation between PA and supervisor ratings. Participants completed measures assessing the extent to which they felt depressed vs. “peppy.” In addition, each participant was rated by at least two observers on two occasions on the number of times the person smiled, laughed, or said something funny. This combined measure of PA (including both the self-reported and observational items) was shown to be related to an increase in positive supervisor ratings as well as income 18 months later. Wright and Staw (1999) also found that PA, measured by an 8-item scale of psychological well-being (reflecting positive as opposed to negative affect; Berkman, 1971), predicted more positive supervisor ratings, both one year and three and a half years later.
Pelled and Xin (1999) investigated the link between PA (as measured by the Positive and Negative Affect Schedule [PANAS]; Watson, Clark, & Tellegen, 1988) and absenteeism (number of hours missed due to both paid and unpaid personal leave, not including hours missed for sickness, family deaths, disability, or civic leave) five months later. They found that workers who were higher on PA had a lower rate of absenteeism, and this relationship was mediated by job satisfaction. In a study of graduating seniors entering the workforce, Burger and Caldwell (2000) found that PA (assessed with the PANAS) was related to a greater likelihood of scheduling a second interview with potential employers. The authors believed this was a marker of successfully navigating the initial job interview.

*Health and coping.* PA has been shown to have a positive effect on health and immune functioning. Fredrickson and colleagues (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000) have investigated the ability of positive emotions to help people overcome the potentially damaging physiological states caused by negative emotions. They have consistently found that induced positive emotion leads to a faster recovery from the increased arousal (as measured by heart rate, diastolic and systolic blood pressure, etc) due to the earlier induction of negative emotions. McClelland and Cheriff (1997) investigated the link between PA (induced by watching a humorous film compared to a neutral, informational film) and immune functioning. Participants who watched the humorous film had greater increases from baseline of salivary immunoglobin A, which is considered the body’s main protection against viral and bacterial infections (Goldblum, 1990).
In a recent meta-analysis, Pressman and Cohen (2005) investigated the tie between PA and physical health. They found evidence that dispositional PA is related to a number of positive health outcomes such as decreased symptoms and pain, lower morbidity, and greater longevity among the elderly. They believed that frequent experiences of low-intensity PA (which is more commonly experienced in real-life settings as opposed to the high-intensity PA of many manipulations) leads to improved healthy functioning.

A related line of research has investigated the relationship between PA and coping. Cogan, Cogan, Waltz, and McCue (1987) had participants listen to tapes meant to either induce laughter, relaxation, or boredom. Participants who listened to the laughter and relaxation tapes were able to tolerate greater amounts of pressure from a blood pressure cuff before complaining than those in the boredom tape condition. A second study found that these effects were due to the emotion induced and not simply due to increased distraction that was potentially induced by the more enjoyable audio clips.

Schuettler and Kiviniemi (2006) investigated the link between mood and effective dealing with a medical diagnosis. Participants were asked to imagine that they had been diagnosed with renal cell cancer. They then underwent elation, depression, or neutral mood inductions (Velten, 1968). Subsequently, participants rated their motivation to overcome cancer, self-appraisals, and willingness to engage in treatment for the illness. Participants in the PA condition were more likely to want information about the disease, had more positive self-appraisals, were more likely to intend to follow through with the imagined treatment, and were more likely to believe they could recover from the imagined illness. Self-appraisals, expectations, and concerns about the illness mediated
the relationship between mood and intentions to follow through with treatment.

Summary of evidence. Lyubomirsky and colleagues (2005) conducted a meta-analysis of the research linking the experience of happiness with success in multiple domains. They started with the assumption that ample evidence supports the position that success leads to the experience of happiness. However, their primary goal was to examine whether the relationship worked the other way as well (i.e., happiness leads to success). They predicted that happy people (“those who experience a preponderance of positive emotions;” p.803) were more likely to be successful in a number of key life areas including work, social relationships, health, positive perceptions of self and others, sociability, likeability/cooperation, prosocial behavior, coping, and problem solving. Accordingly, Lyubomirsky et al. (2005) analyzed data from correlational, longitudinal, and experimental studies that looked at whether happiness led to success. First, they found that there is a strong cross-sectional positive relationship between happiness and behaviors reflecting success (mean $r$s ranged from .26 for creativity to .39 for positive perceptions of self and others). This shows that the two phenomena are related but the direction of causality remains unclear. Next, they found that there was a longitudinal link between happiness and later success and success-related behaviors (mean $r$s ranging from .18 for health to .27 for coping). These methods still leave open the potential that a third-variable explanation exists. Finally, using experimental studies, they found that induction of short-term positive affect led to greater success and culturally-approved behaviors (mean $r$s ranging from .25 for creativity to .51 for sociability; Lyubomirsky et al., 2005). The researchers believed that this established a strong argument in favor of the causal effect that experiences of happiness has on succeeding in culturally-relevant domains.
An Explanation for the Happiness-Resource Building Connection

The advantage of experiencing negative emotions is immediately clear: the person is able to deal with the stressor at hand and survive. The advantage of positive emotions is not as immediately obvious and generally builds over time. According to the Broaden-and-Build model (Fredrickson, 1998), the experience of positive emotions allows us to build our resources by operating more openly or focusing on the experiences we have already had. Each emotion plays a different role and evolved for distinct reasons. Below is Fredrickson’s (1998) evolutionary explanation for the experience of joy, interest, contentment, and love and how they may have helped our ancestors survive.

Joy has been tied to the nondirected urge to play and be creative. This allows the individual to develop skills that may be needed in future encounters. For example, rough-and-tumble play behavior in young animals often resembles fighting, which the animal may need later in life when encountering a predator or competing for scarce resources. By playing (encouraged by the experience of joy), the individual will be more ready to face dangers that it will encounter later in life.

Interest encourages exploration and the incorporation of new information. Exploration of the environment can lead to the discovery of new resources, such as food, shelter or water. In times when resources are short, those that are more willing to explore (due to the experience of interest) will have more resources to fall back on and be more likely to survive. Also, mental resources such as intelligence can be increased through exploration of novel situations. These mental resources will allow one to work and cope with difficult situations that may arise in the future.
Contentment encourages the savoring and integration of previous experiences. Experiences that bring about contentment are likely to be those that were effective. By reflecting on what one did in the past that was successful and integrating them into the broader sense of self, they are more likely to be used in the future. When a new danger is revealed or a new obstacle needs to be overcome, those that have reflected back on what has worked for them in the past (due to the experience of contentment) will be more likely to be able to effectively deal with the new threat or obstacle.

Love encourages all of the above emotional experiences (and their resulting advantages) to occur within close relationships. By playing, exploring, and savoring with another, the bond between the two is strengthened. When a new stressor has arisen, the individual will have increased social resources (developed through the play, exploration, and savoring with the other) necessary to successfully deal with the stressor (Fredrickson, 1998).

Based on the above analysis, it can be seen that positive emotions (including happiness) lead to the accrual of resources through the broadening of thought-action repertoires. With this increased attention, people are better able to adapt to their environment. This adaptation includes (but is not limited to) those behaviors discussed above: better relationships, better conflict resolution, greater success at work, and greater coping.

*Is All Happiness the Same?*

The current literature treats happiness as a unitary construct; no differentiation is made between types of happiness (c.f., Lyubomirsky et al., 2005). However, there may be some differences between the experiences that give rise to happiness. For example,
the happiness that comes about from helping others might be quite different from the 
happiness that comes about from winning the lottery. If this is true, one may expect that 
the resources that may accrue from these different forms of happiness may be different as 
well. If, as proposed by the Broaden-and-Build model (Fredrickson, 1998), happiness 
leads to growth within the person, success in an experience that is based in growth should 
lead to even greater resource building. Happiness that follows growth might serve as a 
reinforcement, confirming that growth is desirable and, thus, leading to further growth.

According to Self-Determination Theory (SDT; Deci & Ryan, 1985b; Ryan & 
Deci, 2000), those experiences that lead to fulfillment of one’s basic psychological needs 
allow the person to grow as well. The basic needs proposed by SDT are competence (a 
sense that you have an effect on your environment), autonomy (a sense of choice in and 
ownership of one’s actions), and relatedness (a sense of having close meaningful 
relationships). Therefore, success in one of these areas should lead to greater growth than 
success in an area that is unrelated to these goals. The following section discusses how 
one need in particular—autonomy—is fulfilled.

The Experience of Autonomy

When looking at what fulfills one’s need for autonomy, SDT posits that both what 
a person pursues as well as why a goal is pursued is important (Ryan, Sheldon, Kasser, & 
Deci, 1996; Deci & Ryan, 2000). These two issues, the what and why of behavior, are 
unique and independent components of autonomy. Each issue is discussed below.

Why a Goal is Pursued

One component of living autonomously is acting in a self-determined manner, 
where the regulation of behavior is located within the self. The archetype for self-
determined regulation of behavior is intrinsic motivation, where the behavior is engaged in simply for the pleasure of engaging in it (Ryan & Deci, 2000).

The opposite of intrinsic motivation is extrinsic motivation, wherein one engages in a given behavior in order to achieve some other end. One extension of SDT, known as Organismic Integration Theory (Deci & Ryan, 1985b), proposes that extrinsic motivation can be regulated in a number of ways that vary in the extent to which the person feels free (self-determined) to engage in the behavior. The theory also explicates what types of environments are likely to encourage different levels of internalization of behavior that was initially extrinsically motivated, and the outcome of regulating behavior at such levels.

When attempting to outline the different types of motivated behavior, an important focus is where the individual locates the source of the regulation (or maintenance) of one’s motivation. Perceived Locus of Causality (PLOC; deCharms, 1968; Ryan & Connell, 1989) represents the source of such regulation. A person with an external PLOC sees the motivation for a given behavior arising from and being regulated by the environment. A person with an internal PLOC sees the behavior arising and being regulated from within themselves. As will be seen, this is not truly a dichotomy; a person’s PLOC for a given behavior can be somewhat internal and somewhat external.

Ryan and Deci (2000) outlined the continuum of the regulation of behavior. At one end of the continuum, extrinsic motivation leads to behavior that is externally regulated. This is behavior that a person enters into due to circumstances in the environment (such as rewards, praise, deadlines, etc.). The perceived locus of causality is fully outside of the self. Often, when the external contingencies are removed, the person
will no longer engage in the behavior since the sole purpose of the action was to gain or avoid the contingencies. Moving along the continuum towards a more internal locus of causality is introjected regulation of behavior. Introjected regulation means that the person believes that he must enact the behavior in order to avoid a sense of guilt. The locus of causality is more internal than in external regulation, but the person does not truly own their behavior. The individual has “swallowed whole” the necessity of engaging in a given behavior; one feels like one should or must engage in the behavior. A more internal regulation is identified regulation. Those performing a behavior on the basis of identified regulation have begun to see the importance of engaging in the behavior (so it is more self-determined); the person truly believes that the behavior is important but has not taken the regulation fully into his or her true self. The most internal regulation of extrinsically-motivated behavior is achieved through integrated regulation. While not meeting the requirements for intrinsic motivation (the behavior is not engaged in for its own sake), behavior with an integrated regulation is considered to have an internal locus of causality and is self-determined. The person is engaging in the behavior because he values it and wholly endorses doing it.

Environments can also foster greater autonomy in the pursuit of a given behavior (a more internal PLOC). Environments that foster autonomous engagement are those that provide a sense of personal choice (the individual feels that he decided to engage in the behavior); recognize the point of view of the individual (informing the individual that this activity may not be as enjoyable as one would like); give a reason for a given behavior (explaining the importance of the activity); and minimize tangible rewards (i.e., payment, prizes, etc.), deadlines, and other external pressures (Ryan & Deci, 2000).
While there is a significant focus on the role of the environment as either encouraging or discouraging autonomous behavior, there are also individual differences in the extent to which a person perceives their actions as autonomous or controlled. Deci and Ryan (1985a) constructed the General Causality Orientation scale to measure the extent to which people regulate their behavior internally, externally, or not at all (impersonal; Deci, 1980). The first two orientations were later renamed autonomy and control orientations, respectively. People with internal (or autonomous) regulation experience greater need satisfaction than people with external (or controlled) regulation (cf., Williams & Deci, 1996; Black & Deci, 2000). In summary, both situational and dispositional factors determine the extent to which behavior is autonomously regulated.

**What Goal is Pursued**

According to the SDT framework, those goals that are in greater alignment with one’s true self should lead to the fulfillment of that person’s basic psychological needs. One way to explore if a goal is in alignment with one’s true self is to examine the fit or consistency between goals and one’s general motive dispositions (McClelland, 1985). This approach has been taken by Brunstein, Schultheiss, and Grässmann (1998) as well as Sheldon and Elliot (1999). If a goal is concordant with one’s trait-level dispositions, it should be in service of one’s true self.

Another approach to determine whether a goal is in alignment with one’s self is to examine whether it is pursued as a first-order value (i.e., for its own sake) or for another reason. For example, a person may help another because they value helping others (first-order value) or because of other goals (e.g., recognition, money, etc). If the person helps
someone in the hope of being offered a reward, this action does not support a first-order value (Ryan, Huta, & Deci, 2008).

Kasser and Ryan (1993) investigated the correlates of different life aspirations. They proposed that aspirations focused on self-actualization and need fulfillment, such as the pursuit of self-acceptance, affiliation, and community, would be related to enhanced well-being. However, the pursuit of more controlled aspirations, such as financial success, would be related to poorer well-being. Kasser and Ryan (1996) expanded the list and more clearly defined the categories of self-determined versus controlled aspirations. They defined extrinsic and intrinsic goals as follows:

*Extrinsic* goals… are those that depend on the contingent reactions of others.

Further, they are typically engaged in as means to some other end. Conversely, *intrinsic* goals … are expressive of desires congruent with self-actualization and growth tendencies. As such, intrinsic goals are likely to satisfy basic and inherent psychological needs (p. 280, emphasis in original).

Kasser and Ryan (1996) hypothesized that intrinsic goals (focused on first-order aspirations) were self-acceptance, affiliation, community feeling, and physical fitness. Financial success, social recognition, and an appealing appearance were hypothesized to be extrinsic goals (not focused on first-order aspirations). Factor analysis showed that measures of both the importance of and likelihood of obtaining these goals loaded on separate factors matching this distinction. Unlike the first approach discussed above (measuring concordance between goals and dispositions), this conceptualization of autonomous goals allows for easier testing, due to the *a priori* definition of intrinsic and
extrinsic goals (based on previous theoretical work investigating self-actualization, need fulfillment, and contingent regard).

Measuring the Outcome of Successful Autonomous Living

SDT research aims to test whether being autonomous results in greater happiness and better functioning. Being happier, in turn, can be assessed by the Subjective Well-Being scale (Diener, 1984) or some other mood measures. Improved functioning can be assessed by measures such as vitality (Ryan & Fredrick, 1997). Some examples of this research are presented below.

Outcomes of autonomous vs. controlled goal pursuit. Sheldon, Ryan, and Reis (1996) explored whether daily satisfaction of the needs of autonomy and competence would lead to increases in well-being. They found that people who possess higher levels of trait autonomy and competence satisfaction (assessed at baseline) had higher average levels of daily well-being assessed by high PA, low NA, and high vitality. In addition, they found that on days when a person’s need satisfaction was above their baseline, they also experienced increased levels of well-being. These results point to the robustness of these effects, since they were obtained in both a between- and within-person frameworks.

Assor, Roth, and Deci (2004, Study 2) examined the effects of parental conditional regard, where parents only show support for their child when the child behaves in a way that the parents approve. Such support discourages autonomous regulation because a person engages in the behavior for an external reason (i.e., to please others) which locates the regulation of the behavior outside the self. They found that parental conditional regard in a given domain (e.g., controlling emotions) predicted the use of introjected regulation for that domain (assessed by asking participants to what
extent they felt internal pressure to engage in emotional control). They also found that the use of conditional regard was related to greater self-esteem fluctuations, resentment towards parents, short-lived satisfaction after engagement in the target behaviors, as well as shame and guilt when not engaging the behaviors (the mediating role of introjection in the above relationships was not tested).

Ryan, Rigby, and King (1993) investigated how the level of internalization of religious beliefs relates to well-being. People who had introjected their religious beliefs were compared to those who had identified with (a more internal PLOC) their religious beliefs. It was found that identified regulation of religious beliefs was related to increased well-being (represented by greater self-esteem and lower anxiety, depression, somatization, and social dysfunction). Introjected regulation of religious beliefs, on the other hand, was related to decreased well-being (represented by lower self-esteem, and higher scores on anxiety, depression, somatization, and social dysfunction; however, the effect was not significant on the last indicator).

Sheldon and Kasser (1998) examined whether autonomy versus control orientation moderates the relationship between goal progress and well-being. They hypothesized that progress toward goals that were pursued for more self-determined reasons would lead to greater increases in well-being than progress toward goals that were pursued for more controlled reasons. Their study supported this hypothesis. Participants who made greater progress towards their goals experienced greater increases in SWB. This result was moderated by the level of autonomy participants felt for those goals; those who felt greater autonomy in pursuing their goals had a more positive relationship between progress and SWB than did those who felt more controlled in
pursuing their goals. This result was found for both short-term (five days) and long-term (over the course of the semester) well-being.

The above studies provide strong evidence that the why of goal pursuit (i.e., the reasoning behind a goal) has implications for one’s well-being. When people succeed in attaining goals that they are pursuing for autonomous reasons, they experience increases in well-being. When the reasons for pursuing goals are more controlled or extrinsic, those who succeed in achieving them are less likely to show an increase in well-being.

Outcomes of self-congruent vs. self-incongruent goal pursuits. As mentioned above, the type of goals a person possesses is theoretically distinct from why a certain goal is pursued. Researchers have attempted to understand what types of goals are more likely to lead to increased well-being when pursued. Brunstein and colleagues (1998) found that people only experienced enhanced emotional well-being (assessed by PA and NA) when they made progress toward goals that are concordant with their motive dispositions; progress toward discordant goals did not lead to enhanced well-being.

Sheldon and Elliot (1999) investigated why pursuing and achieving goals that were concordant with one’s motive dispositions lead to increased well-being. They hypothesized that if people are able to achieve motive-congruent goals, they will experience greater need satisfaction and then greater well-being. They found that attainment of motive-congruent goals led to greater increase in need satisfaction (relative to attainment of motive-incongruent goals), which led to greater increase in SWB. They inferred that the fulfillment of basic psychological needs mediates the relationship between goal congruence and SWB.
Kasser and Ryan (1993) investigated the outcome of having goals based on intrinsic vs. extrinsic values. They found that the pursuit of self-acceptance, affiliation, and community feeling led to positive outcomes, such as increased well-being (self-actualization and vitality) and decreased distress (depression and anxiety). However, when greater importance was placed on the pursuit of financial success, people were more likely to experience decreased well-being and increased distress. Further work by Kasser and Ryan (1996) supported the proposition that a preference for extrinsic goals was related to decreased adjustment (assessed by self-actualization, vitality, and PA) and increased depression and narcissism. A preference for intrinsic goals was related to increased adjustment and decreased depression and narcissism.

In addition to studying why goals were pursued (as discussed above), Sheldon and Kasser (1998) also examined whether the goals that people pursued were aimed towards intrinsic (growth, intimacy, or societal contributions) or extrinsic (physical attractiveness, popularity, or financial success) aspirations. They found that those who were pursuing intrinsic goals had a stronger relationship between progress and change in SWB than those pursuing extrinsic goals.

Kasser and Ryan (1996) outlined three possible explanations for the negative relation between the pursuit of extrinsic goals and well-being. First, it is possible that having extrinsic goals is part of a larger emotional instability. Supporting this explanation, Kasser, Ryan, Zax, and Sameroff (1995) found that people who pursue extrinsic goals had less nurturing parents and were of lower socioeconomic status. Perhaps, people who come from such unfulfilling backgrounds develop a sense of insecurity and pursue extrinsic goals as an alternate source of a sense of worth and
approval. A second explanation was that the focus on extrinsic goals might lead to less fulfillment of basic needs and self-actualization. Finally, it may be more difficult to attain these extrinsic goals, and the stress experienced from this lack of attainment might lead to decreased well-being. The second explanation fits well with the framework outlined here. Even if people succeed in achieving extrinsic goals, they are not experiencing growth that comes from fulfilling a basic need.

The independence of what and why.

As stated above, proponents of SDT proposed that the what and the why of goal pursuits are independent (Ryan et al., 2008). Sheldon, Ryan, Deci, and Kasser (2004) attempted to show that both components of goal pursuit have independent effects on a person’s well-being. In Study 1, participants were asked to imagine pursuing three intrinsic and three extrinsic goals. They were then asked to rate the extent to which they would be pursuing these goals for identified, intrinsic, external, and introjected reasons. They also rated to what extent they thought each of the goals would bring them happiness. The hypothesis was supported: both the content of the goals as well as reasons for pursuing goals were independently related to happiness (more intrinsic goals and more autonomous motivation were related independently to greater happiness). The hypothesis was further supported in Studies 2 and 3, using a person’s self-reported goals (rather than the goals provided to participants in Study 1) and self-reported motivation for pursuing these goals. It was shown that both the content of the goals and the reasons for pursuing them were independent predictors of actual happiness both concurrently (Study 2) and prospectively (Study 3).
The Present Investigation

The existing literature treats happiness as a unitary construct and does not differentiate between the sources of a person’s happiness. If, as proposed by Broaden-and-Build (Fredrickson, 1998), happiness leads to the building of resources through the experience of growth, then happiness that comes from experiences that encourage growth should lead to greater resource building than happiness that is not associated with growth-focused experiences. The reason is that happiness can serve as a reinforcement for growth-related experiences, thus encouraging the individual to continue the same trajectory. Stated differently, happiness can signal to the individual that growth is beneficial and that further growth will be even more desirable. According to SDT (Ryan & Deci, 2000), growth occurs when a person’s basic psychological needs are fulfilled. Therefore, it can be hypothesized that happiness is most beneficial when it is coupled with or is part of an autonomous (or other basic need fulfilling) experience. On the other hand, happiness should be less beneficial when it is due to experiences that are not focused on need fulfillment.

There is empirical support for the position that positive emotions lead to broadened thinking and greater creativity. Isen and Daubman (1984) found that induced PA led participants to include weak or unusual exemplars in a categorization task (e.g., including a crane in the category of tools) and sorting colors into broader categories. Apparently, participants in the PA condition were able to think more broadly about what the categories meant and therefore included less obvious exemplars. Estrada, Isen, and Young (1994) found increased creativity (as measured by performance of the Remote Associates Task) among those who were led to experience more positive affect.
Fredrickson and Joiner (2002) investigated the relationship between the experience of positive emotions and coping. They found that dispositional PA predicted an increase in broad-minded coping over a five week period. There were no other relationships between PA and coping style or any effects involving NA.

There is some similarity between Broaden-and-Build (Fredrickson, 1998; 2006) and the SDT view of need fulfillment (Ryan & Deci, 2000). Specifically, the expanded thinking and the build up of resources (e.g., exploration, integration, skill development) in the Broaden-and-Build model can be viewed as characteristics of self-actualization—the very essence of need fulfillment. Both theories see growth as a necessary component for being able to function optimally within one’s world. For example, Fredrickson believes that “positive emotions are vehicles for individual growth and social connection: By building people’s personal and social resources, positive emotions transform people for the better, giving them better lives in the future” (1998, p. 224). A similar emphasis on growth is included in the approach of SDT: “According to SDT, satisfaction of these basic needs fosters well-being, and support for and satisfaction of each is a necessary condition for a person’s growth, integrity, and well-being, both within and across domains” (Ryan et al., 2008, p.18).

However, whereas Fredrickson’s (1998) Broaden-and-Build model posits that all positive experiences lead to the development of resources, the current approach is that this is more likely when the positive experience is linked to need fulfillment (e.g., helping your community) than to experiences that do not fulfill one’s basic needs (e.g., winning money). Successful need fulfillment can lead to greater growth exemplified by the broadened thinking and increased creativity that are specified in the Broaden-and-Build
model. On the other hand, successful experiences not based in fulfillment of one’s basic needs simply imply the maximization of pleasure and, as such, is irrelevant to continued growth and personality expansion.

In the current work, the experience of autonomy serves as the representation of need fulfillment. It was noted earlier that both individual differences and situational factors can determine the level of one’s autonomy orientation. Therefore, the moderating role of autonomy also can be tested by using either dispositional measures or situational manipulation. The studies that follow use both procedures.

Before discussing the main studies, two pilot studies are presented that begin to look at the importance of autonomy as a moderator of the relationship between happiness and growth. The purpose is to present some preliminary evidence in support of the current approach before conducting a more exhaustive test of the prediction.

Pilot Study 1

The purpose of Pilot Study 1 was to test whether autonomy moderates the relationship between PA and need satisfaction. Two needs were examined: relatedness and competence. It was hypothesized that the relation between PA and measures of relatedness and competence would be stronger for participants who also were higher in autonomy.

Method

Overview. The study was comprised of two stages: Time 1 (baseline) and Time 2 (follow-up). At Time 1 (September and October), participants filled out in small groups a battery of personality and well-being measures. Later (November), participants filled out online baseline questionnaires that (like those administered at the first session) assessed
personality attributes or behaviors from the last month. At Time 2 (end of March and April), participants filled out in small groups the same questionnaires administered at Time 1 in the lab and online. The study was conducted as part of a larger investigation and only the relevant measures and analyses are reported below.

Participants. Undergraduates from the University of Rochester participated, receiving extra credit for their effort at Time 1 and either extra credit or $25 for their effort at Time 2. One hundred seventy-six participants (127 females and 49 males) completed both stages of the study. Fifteen additional participants completed the baseline measures at Time 1 but did not participate in Time 2 sessions (they transferred to another university, spent the semester abroad, did not respond to a number of e-mails and phone calls, or refused to participate). Those who dropped out of the study were higher on baseline Autonomy Orientation ($M = 5.98$) than those who finished the study ($M = 5.70$; $t(189) = 1.97, p = .05$). There were no other significant differences on the remaining baseline measures, $ps > .31$.

Measures. See Appendix A for the full scales used in Pilot Study 1. PA and NA were assessed at Time 1 with a 10-item measure, requesting participants to rate on a 7-point scale the extent to which they experienced each affect in the last 30 days (e.g., pleased, worried; relevant items were averaged resulting in a scale with reliabilities [$\alpha$] of .89 for PA and .83 for NA). The extent to which participants felt that they were autonomous or controlled in their life was assessed using the General Causality Orientation Scale (Deci & Ryan, 1985a). Participants read 17 scenarios (e.g., You have been offered a new position in a company where you have worked for some time. The first question that is likely to come to mind is…) and rated on a scale of 1 (very unlikely)
to 7 (very likely) how likely they would respond in one of three ways: impersonal (e.g., What if I can't live up to the new responsibility?), control (e.g., Will I make more at this position?), and autonomy (e.g., I wonder if the new work will be interesting). Relevant items were averaged providing summary scores for impersonal ($\alpha = .82$) control ($\alpha = .77$) and autonomy orientations ($\alpha = .80$).

As a measure of competence, participants completed a 10-item measure based on the Multi-Dimensional Self-Esteem Inventory (MSEI; O’Brien & Epstein, 1988) at Time 1 and Time 2. For four of the items, participants rated on a scale of 1 (completely false) to 5 (completely true) the extent to which each statement was true for them (e.g., I am usually able to demonstrate my competence when I am being evaluated). For six items, participants rated on a scale of 1 (almost never) to 5 (very often) how often the particular events happened to them (e.g., How often do you approach new tasks with a lot of confidence in your ability?). Responses were averaged to create an overall score for competence ($\alpha = .86$ and $.87$ at Time 1 and Time 2, respectively).

As a measure of relatedness, participants completed the UCLA Loneliness scale (Russell, Peplau, & Cutrona, 1980). On a scale of 1 (never) to 4 (often), participants indicated how often they experienced 10 positive relatedness-focused situations (e.g., There are people I can turn to) and 10 negative relatedness-focused situations (e.g., I feel isolated from others). Items were averaged to create an overall loneliness score ($\alpha = .91$ and $.90$).

As additional measures of competence and relatedness, participants completed a 23-item Daily Event Schedule (DES) that was adapted from Gable, Reis, and Elliot (2000). Participants rated the extent to which a series of events occurred in the last month...
(1 = Did not happen at all, 7 = Happened frequently). The items could be classified into 4 categories (scores were averaged within each category): positive competence-focused events (e.g., Received praise for my schoolwork; \( \alpha = .72 \) and .75), negative competence-focused events (e.g., Did poorly on a test or other school assignment, \( \alpha = .65 \) and .76), positive relatedness-focused events (e.g., Had especially good interaction with friend(s) or acquaintances, \( \alpha = .62 \) and .74), and negative relatedness-focused events (e.g., Had disagreement with a friend, boyfriend/girlfriend, or family member, \( \alpha = .66 \) and .73). Total competence- and total relatedness-focused events scores also were created by subtracting the negative from the positive average scores (\( \alpha = .75 \) and .74; \( \alpha = .58 \) and .60 for competence- and relatedness-focused events, respectively). Total events were used as the measures of interest (similar results were obtained when positive and negative events were analyzed separately).

Results

In a series of regression analyses, Time 2 competence (MSEI, competence-focused events) and relatedness (loneliness, relatedness-focused events) scores were predicted by their baseline, gender, PA, and autonomy orientation at step 1; all 2-way interactions at step 2; and the three-way interaction at step 3.\(^1\) Except where noted, there were no significant effects of gender or its interactions. When not significant, the regressions were reanalyzed without gender and its interactions.

Competence. There were no significant main effects for PA (\( F < 1 \) for both MSEI and events) or autonomy orientation (\( F < 1 \) for MSEI and \( F = 1.28, \ ns \) for events) for either competence variable. There was no significant PA x Autonomy Orientation interaction on the MSEI (\( F < 1 \)). There was marginally significant PA x Autonomy
Orientation interaction on total competence events \((F(1, 171) = 3.55, p = .06, \beta = .14)\).

*Figure 1* illustrates the interaction. There was a negative relationship between PA and competence-related events for those low in autonomy orientation, and a positive relationship for those high in autonomy orientation. However, neither of these relationships reached significance \((ps > .13)\).

There was a significant PA x Autonomy x Gender interaction for MSEI scores \((F(1, 167) = 4.24, p < .05, \beta = -.13)\). Since this was only one significant result and was not predicted, it will not be discussed further.

**Relatedness.** Overall, there were no significant main effects of PA \((F = 1.98, ns)\) or autonomy orientation \((F < 1)\) on loneliness. There was a significant PA x Autonomy interaction on loneliness \((F(1, 171) = 4.73, p < .05, \beta = -.10)\). As can be seen in *Figure 2*, there was no significant relationship between PA and loneliness for those who are low on autonomy \((1 \text{ SD below the mean}; \beta = .01, ns)\). However, for those high in autonomy, \((1 \text{ SD above the mean}), the higher the PA the lower the loneliness \((\beta = -.16, p < .05)\).

There was no significant relationship between PA and relatedness-focused events \((F < 1)\). There is a marginally-significant positive relationship between autonomy orientation and events \((F(1, 172) = 3.03, p = .08, \beta = .11)\). There was no significant PA x Autonomy Orientation interaction on the relatedness-focused events \((F < 1)\).

The above competence and relatedness analyses were repeated replacing PA with NA. No significant NA x Autonomy orientation interactions were found \((ps > .15)\).

**Discussion**

This study provided some evidence of the moderating role of autonomy in the relationship between PA and need satisfaction. Those who were higher in autonomy
orientation showed a stronger relationship between PA and a decrease over time in loneliness; these same participants also showed a marginally stronger relationship between PA and an increase over time in competence-related events. A major strength of the above study is the longitudinal nature of the design, which allows for a prospective analysis of the moderating role of autonomy.

Pilot Study 2 was intended to replicate the findings of Pilot Study 1 with a different measure of autonomy as well as with different dependent variables.

Pilot Study 2

Pilot Study 1 found moderator effects of autonomy for the influence of happiness on two basic needs. Therefore, Pilot Study 2 examined moderator effects of autonomy for the influence of happiness on eudaimonic life (Waterman, 1984; Ryff & Singer, 1998; Ryan et al., 2008). According to the eudaimonic perspective, well-being is predicated on living in line with one’s true self and realizing one’s potential (Waterman, 1984). Living eudaimonic life was operationalized in the study by Ryff’s (1989) Psychological Well-Being (PWB) scale. The scale assesses the six components Ryff believes compose eudaimonia: Autonomy, Environmental Mastery, Personal Growth, Positive Relations with Others, Purpose in Life, and Self-Acceptance. Research has shown that PWB is related to a number of positive outcomes including physical health (Ryff & Singer, 1998). It was hypothesized that participants with a greater sense of self-determination will show a stronger relationship between PA and PWB.

Pilot Study 2 also examined moderator effects of autonomy on creativity and inspiration. As mentioned above, creativity can be thought of as broadened thinking and can help explain why happiness leads to a number of positive outcomes in life.
Inspiration is characterized by the components of evocation, motivation, and transcendence, and has been shown to be higher in patent holders than in the general population (Thrash & Elliot, 2003). Therefore, inspiration is associated with resource building in general and broadened thinking in particular. It was hypothesized that participants with a greater sense of self-determination will show a stronger relationship between PA and the experience of inspiration and creativity.

Method

Overview. The design was identical to Pilot Study 1, except a diary session was included. Participants completed diaries daily on-line for seven days in November (prior to Thanksgiving) and for another seven days at the beginning of December. The study was conducted as part of a larger investigation and only the relevant measures and analyses are reported below.

Participants. Undergraduates from the University of Rochester participated, receiving either extra credit or $50 for their effort at Time 1 and the 14-day diary phase and either additional extra credit or $15 for their effort at Time 2. Only participants who completed the questionnaires on 10 or more days of the diary phase were allowed to proceed to Time 2 sessions. Two hundred eighty-nine participants (212 females and 77 males) completed questionnaires at Time 1. Of that number, 14 either did not proceed to the diary phase (N = 6) or completed less than 10 diaries (N = 8). An additional group of 27 did not proceed from the diary phase to Time 2 (drop-outs included students who transferred to another university, spent the semester abroad, did not respond to a number of e-mails and phone call, or simply refused to participate). The composition of the group of participants who completed all phases of the research (184 females and 49 males) was
predominantly female. There were no significant differences between those who completed the entire study and those who did not on any of the baseline measures ($ps > .05$).

**Measures.** See Appendix B for the full scales used in Pilot Study 2. PA and NA were assessed at Time 1 using the same measure as reported in Pilot Study 1 ($\alpha = .91$ and .84, respectively). Participants’ trait level of self-determination was measured at Time 1 using the Self-Determination Scale (SDS; Sheldon & Deci, 1996). For each item, participants were provided with two statements and were asked to rate on a scale of 1 (Only A feels true) to 5 (Only B feels true) the extent to which they felt the statements felt true to their life. The SDS is made up of two subscales: Perceived Choice measures the extent to which people have the experience of choice in their life (e.g., A. I am free to do whatever I decide to do. B. What I do is often not what I'd choose to do). Awareness of Self measures the extent to which the person feels like the owner of their self (e.g., A. I feel that I am rarely myself. B. I feel like I am always completely myself). Relevant items were averaged to create two subscales measuring choice ($\alpha = .80$) and awareness ($\alpha = .71$). The two subscale were correlated ($r = .51$, $p < .001$) and were therefore combined to get an overall self-determination score ($\alpha = .82$).

Eudaimonia was assessed at Time 1 and 2 using Ryff’s (1989) PWB scale, which is composed of six measures. Participants rated on a scale of 1 (strongly disagree) to 6 (strongly agree) the extent to which they agree with each statement, and averages of relevant items were used to create summary scores. The measures were as follows: Autonomy assesses the extent to which the person feels independent (e.g., I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people; $\alpha$
Environmental Mastery assesses the extent to which a person feels competent in their interactions with their environment (e.g., I am good at juggling my time so that I can fit everything in that needs to get done; \( \alpha = .81 \) and .81). Personal Growth assesses the extent to which the person believes they are growing and becoming more effective over time (e.g., In general, I feel that I continue to learn more about myself as time goes by; \( \alpha = .76 \) and .79). Positive Relations with Others assesses the extent to which the person has close relationships and is capable of intimacy (e.g., Most people see me as loving and affectionate; \( \alpha = .82 \) and .84). Purpose in Life assesses the extent to which a person has goals in life and a sense of directedness (e.g., I feel good when I think of what I've done in the past and what I hope to do in the future; \( \alpha = .75 \) and .80). Self-Acceptance assesses the extent to which people have a positive attitude about themselves with an awareness of both the good and bad characteristics they possess (e.g., I made some mistakes in the past, but I feel that all in all everything has worked out for the best; \( \alpha = .88 \) and .88).

Correlations between the PWB subscales ranged from .30 to .78 at Time 1 and from .31 to .76 at Time 2 (all correlations were significant at \( p < .001 \)). Principal components analyses revealed that the subscales loaded on a single factor that accounted for over 60% of the variance at both Time 1 and Time 2 with no loadings below .65. The subscales were therefore combined into an overall eudaimonia score (\( \alpha = .87 \) and .88).

Trait-level inspiration was measured at Time 1 and 2 using the Inspiration Scale (Thrash & Elliot, 2003). Participants rated how often on a scale of 1 (never) to 7 (very often) and how deeply or strongly on a scale of 1 (not at all) to 7 (very deeply or strongly) they experience inspiration. Subscales for the frequency (\( \alpha = .89 \) and .91) and
intensity ($\alpha = .88$ and .89) were created by averaging relevant items. The two subscales were correlated ($r = .57$ and .61 for Time 1 and Time 2, respectively) and were therefore combined into an overall inspiration score ($\alpha = .90$ and .91).

On each day during the diary period, participants rated the extent to which they experienced a feeling of inspiration as well as creativity. Participants were able to select “I did not experience this today” (coded 0), “I did experience this, very mildly” (coded 1) to “I did experience this, very intensely” (coded 5). The mean of people’s reports were calculated to provide a measure of average inspiration and creativity. This method was adapted from Thrash and Elliot (2003). The mean scores for inspiration and creativity were highly correlated ($r = .85, p < .001$), therefore they were averaged to create one composite of average daily creativity score.²

Results

Two series of regression analyses were conducted: one to examine eudaimonia and the other to examine inspiration and creativity. In all regressions, the outcome variable was regressed on its baseline (except where noted), PA, and self-determination (or one of its subscales) in step 1 and on the PA x Self-Determination interaction in step 2. All analyses originally included gender and its interactions. In most cases, there was no significant main effect or interactions for gender. Exceptions will be noted.

Eudaimonia. Table 1 displays the $F$s and $\beta$s for the prediction of the PWB overall, as well as the individual subscales.³ The top panel of the table displays the results when the full SDS was used followed by panels presenting parallel results for the choice and awareness subscales. The PA x Self-Determination interaction had a marginally significant relationship with the overall Eudaimonia score ($p = .09$). As
shown in Figure 3, those 1 SD below the mean on the SDS had no significant relationship between PA and eudaimonia scores ($\beta = -.01, p = .90$). Those 1 SD above the mean showed a significant positive relationship between PA and Eudaimonia scores ($\beta = .12, p = .05$). This relationship seems to be due primarily to the environmental mastery and personal growth subscales (interaction $p = .08$ and .06, respectively). The above results are similar when choice is used instead of the full SDS score. However, awareness does not yield similar results.

The above analyses were repeated replacing PA with NA. No significant NA interactions were found ($ps > .12$).

*Inspiration and Creativity.* Table 2 presents the $F$s and $\beta$s for the prediction of inspiration at Time 2 as well as the composite diary creativity scores (trait inspiration from Time 1 served as baseline for both analyses). There was a marginally significant PA x Self-Determination interaction for Time 2 inspiration ($p = .10$). As shown in Figure 4a, those low on self-determination (1 SD below the mean) had a nonsignificant negative relationship between PA and inspiration ($\beta = -.11, p = .13$). Those high on self-determination (1 SD above the mean) did not have a significant relationship between PA and inspiration ($\beta = .04, p = .61$). There is also a significant PA x Self-Determination interaction on the creativity composite ($p < .001$). As shown in Figure 4b, those 1 SD below the mean on self-determination did not have a significant relationship between PA and mean creativity scores ($\beta = .05, p = .53$). Those 1 SD above the mean on self-determination had a significant positive relationship between PA and mean creativity ($\beta = .38, p < .001$). The above results are stronger when the choice subscale is substituted for the full SDS.
The above analyses were repeated replacing PA with NA. There was a significant NA x Choice interaction on Time 2 inspiration ($F(1, 243) = 5.30, p < .05, \beta = -.12$). There were also significant NA x Self-Determination ($F(1, 270) = 7.49, p < .01, \beta = -.15$) and NA x Choice interactions ($F(1, 270) = 9.63, p < .01, \beta = -.17$) on the creativity composite. In each case, the higher the participants were on self-determination or choice, the more negative the relation between NA and inspiration/creativity. When the above analyses are rerun with both PA, NA, and the appropriate interactions, the NA interactions reviewed above were no longer significant ($ps > .25$). In these same analyses, the PA x Choice interaction on Time 2 inspiration became nonsignificant ($p > .35$); the PA x Self-Determination interaction on the creativity composite remained significant ($p < .05$); and the PA x Choice interaction (also on the creativity composite) became marginally significant ($p = .07$). Overall, these results indicate that the effects involving NA were mostly due to the relation between NA and PA and not to an independent effect of NA.

Discussion

It was found that participants high in self-determination showed a somewhat stronger relationship between PA and increases in eudaimonic well-being as measured by Ryff’s (1989) PWB scale. Importantly, the two subscales that seemed to be driving the effect were environmental mastery and personal growth. These seem to be the two subscales that are most consistent with Fredrickson’s Broaden-and-Build (2006) theory as well as SDT (Deci & Ryan, 1985b). Personal growth assesses the extent to which a person is developing and is open to new experiences. According to Broaden-and-Build, PA acts to allow the person to be open and explore new areas and gain experience. SDT
posits that growth is one of the outcomes of need satisfaction. Environmental mastery is similar to the basic need for competence, which is clearly linked to SDT’s theory of growth.

Participants high in self-determination also showed a stronger relationship between PA and increases in inspiration/creativity. This finding supports the idea that inspiration and creativity are resources that autonomously-derived PA helps to develop. Inspiration and creativity imply an ability to produce new ideas, to find new paths, and to make new contributions. Not surprisingly, creativity has been linked to conditions that facilitate autonomy and intrinsic motivation (cf., Amabile & Gitomer, 1984).

The strongest findings from this study came when the choice subscale of the SDS was used as a moderator of happiness effects. This may suggest that choice is the more important component of self-determination in answering the question of what type of happiness is truly beneficial. However, the results of one study should not be taken as conclusive evidence that awareness does not play an important role in the link between PA and success. Further work needs to examine the importance of each component in moderating happiness effects.
Chapter 2: Study 1

The purpose of Study 1 was to investigate the moderating role of trait autonomy in the relationship between trait PA and coping styles and life events. Previous research (Fredrickson & Joiner, 2002) has shown that PA is related to greater use of adaptive forms of coping but unrelated to use of maladaptive forms of coping. Therefore, adaptive coping can be seen as one of the resources that positive emotions help to develop. It was expected that those high on autonomy will show a stronger relationship between PA and adaptive coping than those who are low on autonomy. It also was expected that those high on autonomy will show a stronger relation between PA and life events, replicating a similar finding in Pilot Study 1.

Coping Strategies

Lazarus (1966) proposed that people deal with stress in three steps: primary appraisal, secondary appraisal, and coping. Primary appraisal—the first step—is the assessment about the relevance of an event. If a person decides the event is irrelevant to their well-being, they will not respond. If they decide the event is relevant, they need to determine if it is a potential benefit (helpful to the person), challenge (potential for growth) or threat (potential for harm to one’s self, goals, well-being, or to another person). Secondary appraisal, the second step, involves determining how to respond to the threat (determining if there is anything they can do to decrease the harm or increase a potential benefit from the situation). Coping—the third step—is the actual response that a person uses to deal with a stressful situation.

One primary classification of coping responses is Folkman and Lazarus’s (1980; 1985) characterization of problem- and emotion-focused coping. Problem-focused
coping involves attempts to directly engage the source of stress. This form of coping is likely to be used when people believe that they can have some sort of impact on the stressor. Emotion-focused coping involves attempts to reduce the negative emotional response one has to a stressor. Emotion-focused coping is likely to be used when a person believes that they have no control over the stressor and must instead attempt to adapt to the situation. In general, coping is viewed as adaptive if there is a fit between the nature of the stressor and the nature of the coping response, i.e., directing problem-focused coping at controllable stressors and emotion-focused coping at uncontrollable stressors.

Carver, Scheier, and Weintraub (1989) believed that the problem- vs. emotion-focus model hid some important distinctions among the many different coping techniques that belong to each category. Further, they believed that some coping techniques interfere with a person’s attempts to deal with the stressor. They created the COPE to measure fourteen strategies that people use to manage their stress, each assessed by four items (with the exception of Alcohol-drug disengagement, which is assessed by one item). The top panel of Table 3 lists the COPE subscales along with a sample item for each. Most of the subscales can be characterized as either problem-focused coping (e.g., planning) or as emotion-focused coping (e.g., denial).

Actual correlations among the scales indicated that the various coping strategies formed two clusters (Carver et al., 1989). The first cluster was composed of adaptive coping strategies: Active coping, Planning, Suppression of competing activities, Restraint coping, Positive reinterpretation and growth, as well as both Seeking support scales. These coping approaches were also correlated with a number of positive outcomes such
as optimism, self-esteem and hardiness. The second cluster contained maladaptive coping strategies: Denial, Behavioral disengagement, Mental disengagement, Focus on and Venting of emotions, and Alcohol-drug disengagement. The maladaptive strategies showed positive correlations with indicators of ill-being such as anxiety, and negative correlations with indicators of well-being such as self-esteem and hardiness. The two clusters were also negatively correlated with each other.

Stanton and colleagues (Stanton, Danoff-Burg, Cameron, & Ellis, 1994; Stanton, Kirk, Cameron, & Danoff-Burg, 2000) noted that most subscales of emotion-focused coping in the COPE as well as other coping inventories appear maladaptive (e.g., denial, mental-disengagement, etc.). They argued that a comprehensive coping inventory should include more adaptive emotion-approach coping techniques, which are focused on understanding and processing one’s emotional responses to the stressor. The original COPE (Carver et al., 1989) lacks scales that assess emotional approach coping. The absence of this and some other coping strategies from the COPE led Zuckerman and Gagné (2003) to construct an extended COPE, consisting of the original subscales and several new ones. The middle panel of Table 3 lists the subscales added by Zuckerman and Gagné. In addition to adding subscales, Zuckerman and Gagné revised the Mental disengagement subscale from the COPE due to its low internal reliability (.45 in Carver et al.’s study and ranging from .36 to .44 in studies by Zuckerman, Kieffer, and Knee, 1998). Carver et al. (1989) expected that their mental disengagement subscale would yield low reliability, because it assessed a wide range of techniques that people use to avoid dealing with the stressor (work, watching TV, sleeping, etc.). The Zuckerman and Gagné revision (provided in the last panel of Table 3) assesses disengagement from a
stressor without asking about particular behaviors; as such, it was expected to provide improved reliability over the original measure.

Zuckerman and Gagné (2003) factor-analyzed the extended version of the COPE and found five superordinate coping strategies. This led them to construct a new 40-item revised COPE (R-COPE) that assesses five major coping strategies. Table 4 lists the five subscales of the R-COPE as well as the source of the items that make up each subscale. Analysis of the structure of these subscales found two clusters: one, representing adaptive coping, is made up of Self-help, Approach, and Accommodation; the second, representing maladaptive coping, is made up of Avoidance and Self-punishment. However, the five-factor model was found to fit the data better than a two-factor model.

Zuckerman and Gagné (2003) found that the adaptive coping cluster was positively related to a number of positive constructs (realistic control beliefs, mastery goals) and negatively related to several negative constructs (depression and self-handicapping). The maladaptive cluster was positively correlated with performance-avoidance goals, self-handicapping, and depression and negatively correlated with realistic control beliefs. In addition, prospective analyses showed that the adaptive cluster was related to increases in autonomy orientation, PA, and self-esteem (except that Approach was not related to self-esteem). The maladaptive cluster was related to increases in control orientation (as defined by SDT; Deci & Ryan, 1985a) and NA. Self-punishment was also related to decreases in self-esteem. These results offer support for the labeling of these subscales as adaptive and maladaptive.

As noted earlier, it was proposed that those who are higher on autonomy would show a stronger positive prospective relation between PA and adaptive coping styles.
Fredrickson and Joiner (2002) showed that PA was not significantly related to maladaptive forms of coping. Therefore, no *a priori* predictions were made about the moderating role of autonomy in the relationship between PA and maladaptive coping styles.

In addition to coping, Study 1 investigated the role of autonomy in the relationship between PA and events that a person faces in their life. In Pilot Study 1, participants higher in autonomy showed a more positive relation between PA and events (although only evidence for competence-focused events was found). It was important to see whether this moderator effect could be replicated.

**Method**

**Overview and Procedures**

Three longitudinal samples were used to test the above predictions. Each sample completed trait measures of PA and autonomy at Time 1 and the extended COPE (Zuckerman & Gagné, 2003) twice (Time 1 and Time 2) over the course of three months. Descriptions of each sample and the specific measures that were used are provided below. Table 5 presents the *N* of each sample and the measures that were used to assess PA, autonomy, and coping. Appendix C provides the full versions of all of the measures discussed below. Each sample was part of a larger investigation; only relevant measures are listed. None of the proposed analyses had been conducted prior to the present investigation.

**Sample 1**

Sample 1 consisted of 305 (96 males and 209 females) undergraduates from the University of Rochester (see first panel in Table 5). Six participants did not complete the
study and were therefore excluded from the current analyses. The final sample consisted of 299 participants (96 males and 203 females). There were no significant differences between those who completed the study and those who did not on the variables of interest that were administered initially to all participants ($p > .07$). At Time 1, PA and NA were assessed using the PANAS (Watson et. al, 1988) under instructions that directed participants to indicate on a scale from 1 (very slightly or not at all) to 5 (extremely) the extent to which they experienced each of a number of affects during the last three weeks (e.g., interested, excited). Relevant items were summed to represent each participant’s level of PA ($\alpha = .85$) and NA ($\alpha = .86$) over the past three weeks.

Also at Time 1, participants completed a short 12-item version of the Academic Motivation Scale (AMS; Vallerand et al., 1992). The full AMS includes seven 4-item subscales, but only four were included in this study: One subscale assesses external reasons for going to college (e.g., In order to have a better salary later on; $\alpha = .84$) and three subscales assess three types of intrinsic reasons for attending college: acquiring knowledge (e.g., Because I experience pleasure and satisfaction while learning new things; $\alpha = .85$), accomplishing things (e.g., For the pleasure I experience while surpassing myself in my studies; $\alpha = .86$), and the stimulation in college (e.g., For the intense feelings I experience when I am communicating my own ideas to others; $\alpha = .85$). Participants were asked to indicate on a scale of 1 (does not correspond at all) to 7 (corresponds exactly) the extent to which each reason corresponds to their motivation for going to college. Relevant items were summed to create scores for each subscale.

At both Time 1 and Time 2, participants completed an 82-item version of the extended COPE (Zuckerman & Gagné, 2003). Participants provided a negative event
that had happened to them recently, and then indicated on a scale of 1 (I didn’t do this at all) to 4 (I did this a lot) the extent to which they engaged in a series of behaviors in response to the negative event. This version of the COPE included 11 of Carver et al.’s (1989) original subscales. Turning to Religion, Focusing on & venting emotions, and Alcohol-drug disengagement were excluded (turning to religion was considered a rare response to stress and venting emotions and alcohol/drug appear to confound coping with symptoms). This version also included the subscales added by Zuckerman and Gagné (2003) and the revised Mental disengagement subscale. Finally, this version also yielded scores for the five R-COPE subscales (reliabilities for all Coping scales are presented in the left panel of Table 6).

At both Time 1 and Time 2, participants also indicated whether or not 34 events occurred to them recently (adapted from Epstein & Katz’s [1992] College Students Activity and Events Form). Events on the list included events such as: “Obtained an average of B+ or better in the midterm exams” and “Began a major relationship”. Six independent raters coded each item as to whether it represents a competence- vs. relatedness-focused event and whether it is positive or negative. Based on this coding, the items were combined into competence and relatedness categories that parallel the categories of events used in Pilot Study 1 ($\alpha = .85, .86,$ and $.93$ for competence, relatedness, and positive-negative ratings, respectively).

Sample 2

Sample 2 consisted of 264 (118 males and 146 females) undergraduates from the University of Rochester (see middle panel of Table 5). Forty-eight participants did not complete the study and were therefore excluded from the current analyses. The final
sample consisted of 216 participants (97 males and 119 females). There were no significant differences between those who completed the study and those who did not on the variables of interest ($p < .19$). PANAS (Watson et al., 1988) was used as a measure of PA ($\alpha = .85$) and NA ($\alpha = .85$; instructions were the same as in Sample 1) and the four subscales (three intrinsic and one external) of the AMS ($\alpha = .88, .87, .86, .87$ for intrinsic to know, intrinsic to accomplish, intrinsic for stimulation, and external regulation, respectively; Vallerand et al., 1992) were used to assess motivational orientation at Time 1.

At Time 1 and Time 2, coping was assessed by a 72-item questionnaire that included most subscales from Carver et al.’s (1989) COPE as well as several subscales from Zuckerman and Gagne’s (2003) extended COPE. The procedure was the same as the one used in Sample 1 except that participants were not asked to think of a particular stressful event that had occurred to them. Rather, they were asked to describe how they usually feel about and react to stressful events. The coping questionnaire included all subscales from the original COPE with the exception of Turning to religion and Alcohol-drug disengagement. The questionnaires also included subscale from Zuckerman and Gagné’s (2003) extended COPE except for Goal Replacement and Other Blame (these two subscales were created after the study was completed). The revised Mental Disengagement subscale was also included (reliabilities for all Coping scales are presented in the middle panel of Table 6).

Sample 3

Sample 3 consisted of 238 (75 males, 154 females, and 9 not reporting gender) undergraduates from the University of Rochester (see bottom panel of Table 5). Forty-
two participants did not complete the study and were therefore excluded from the current analyses. The final sample consisted of 196 participants (55 males, 140 females, and 1 not reporting gender). Those excluded scored higher on NA ($p = .02$) and control orientation ($p = .01$) than those who completed the full study (see below how NA and control orientation were measured). There were no other significant differences between those who completed the study and those who did on the variables of interest ($ps > .09$).

At Time 1, PA ($\alpha = .84$) and NA ($\alpha = .87$) were assessed using the PANAS (instructions were the same as in Sample 1; Watson et. al, 1988). Motivational orientation was assessed, using a 12-scenario version of the GCOS ($\alpha = .78$ & $.73$ for autonomy and control orientation, respectively; Deci & Ryan, 1985a). Scoring was similar to the procedure used in Pilot Study 1.

At Time 1 and Time 2, coping was assessed with the same 82-item version of the COPE that was administered to Sample 1. However, unlike the procedure used in Sample 1 and like the procedure in Sample 2, participants rated each item according to how they usually respond to stress (reliabilities for all Coping scales are presented in the right panel of Table 6).

**Results**

**Overview**

The data will be presented in two sections. The first section will focus on the analysis of the coping data across all three samples. The second section will focus on the analysis of the events data from sample 1. In both cases, the general format of the analyses was as follows: Scores from the target variable at Time 2 were regressed on their baseline from Time 1 and on gender in step 1, PA and motivation were entered as
predictors in step 2, and the PA x Motivation interaction was entered in step 3. The analyses were also run including all two-way interactions involving gender as well as the three-way interaction. There were a small number of significant three-way interactions; they will be discussed when relevant.

Each sample contained two measures of motivation. In samples 1 and 2, all of the academic intrinsic motivation subscales were combined to form one measure of intrinsic motivation for academics (α = .85 and .89, respectively based on the correlations among the subscales). Academic external regulation was measured separately by a single subscale that was used in the analyses. In sample 3, the autonomous and control orientation subscales from the General Causality Orientation Scale were used as the measures of interest. In samples 1 and 2, the measure of intrinsic and external regulation were independent (rs = -.02 and .08); in sample 3, autonomous and control orientation were actually positively correlated (r = .26). Therefore, it was decided to analyze the results separately for each measure of motivation.

Typically, PA and NA are viewed as separate constructs. In the current samples they were moderately but significantly correlated in each sample (rs = -.28, -.37, and -.33, ps < .001, in samples 1, 2, and 3 respectively). It was decided, therefore, to repeat the above analyses with NA and, again, with PA minus NA replacing PA as predictors. Using the 5 R-COPE scales as dependent variables, each set of analyses produced only 5 significant interactions between mood (NA or PA minus NA) and motivation (out of 30 possible interactions: 5 R-COPE scales x 2 measures of motivation x 3 samples). However, the significant interactions simply repeated interactions that were found in the analyses using only PA. Therefore, only the PA analyses are presented below.
For the sake of brevity, only results using the R-COPE (Zuckerman & Gagné, 2003) as the dependent variable will be presented here. As previously discussed, the five R-COPE scales can be viewed as a distillation of the many coping scales included in the extended COPE (Zuckerman & Gagné, 2003) into a smaller set. Therefore, most of the variance of the more complete list of scales is captured in these five scales. However, the complete set of results involving all the extended COPE subscales is presented in Appendices D and E and will be discussed briefly below.

Table 7 shows the results for the analyses that used intrinsic motivation (samples 1 and 2) or autonomy orientation (sample 3) as the measure of motivation. Table 8 presents the corresponding results for analyses that used external regulation (samples 1 and 2) or control orientation (sample 3) as the measure of motivation. In each table, the first panel presents the results for sample 1, the second panel for sample 2, the third panel for sample 3, and the last panel for the meta-analytically combined data (see below for the meta-analytic procedures). In both tables, the data presented are the partial correlations between the predictors in each step of the regression equation and the dependent variable (however, the partial correlations between coping baseline at Time 1 and coping and Time 2 are not presented). The partial correlations were combined by computing a weighted correlation average after Fisher-z transformation (N of each study served as weights). Significance levels were combined on the basis of the Stouffer method (converting F tests from each sample to Zs, summing the Zs across samples, and dividing the sum by the square root of 3 to obtain a combined Z). The following will
focus mainly on the combined results. However, differences between these results and results from a particular sample also will be addressed.

Table 7 shows significant main effects of gender on Self-help, Approach, and Accommodation. There was also a marginally significant main effect of gender on Avoidance. In all cases, females reported greater use of the coping techniques than did males. There was only one marginally significant main effect of PA on Self-punishment (all other ps > .15). Those high on PA showed lower levels of self-punishment than did those low on PA. Thus, contrary to results reported by Fredrickson & Joiner (2002), the present study showed only a minimal effect of PA on coping. There were marginally significant main effects of intrinsic motivation on approach and accommodation (all other ps > .11). Those who were higher on intrinsic motivation/autonomy reported greater use of those coping strategies than do those low on intrinsic motivation/autonomy. Thus, there was some support for the positive effects of intrinsic motivation/autonomy on coping.

Across all three samples, there were no significant PA x Motivation interactions on any of the coping scales (ps > .14). However, some significant interactions were found when the individual samples were analyzed. In sample 2, there was a significant interaction on Self-Help. This interaction is illustrated in Figure 5. Partially confirming the hypothesis, those high (1 SD above the mean) on intrinsic motivation had a nonsignificant positive relationship between PA and Self-help ($\beta = .06, p = .49$), while those low (1 SD below the mean) on intrinsic motivation had a negative relationship between PA and Self-help ($\beta = -.15, p < .05$). There was also a marginally significant interaction on Approach. This relationship is graphed in Figure 6. Again partially
confirming the hypothesis, those high on intrinsic motivation had a nonsignificant positive relationship between PA and Approach ($\beta = .16, p = .13$) while those low on intrinsic motivation had a nonsignificant negative relationship ($\beta = -.04, p = .59$).

Finally, there was a significant interaction on Self-punishment (graphed in Figure 7). However, this interaction does not support the hypothesis. Those high on intrinsic motivation had a nonsignificant positive relationship between PA and Self-punishment ($\beta = .04, p = .64$) while those low on intrinsic motivation had a negative relationship ($\beta = -.17, p < .05$).

Turning to Table 8, the gender main effects parallel those reported in Table 7 and will not be discussed. In this set of analyses, there were no significant main effects of PA ($ps > .15$). However, there was a significant main effect of motivation on avoidance and a marginally significant main effect of motivation on Self-punishment (all other $ps > .13$). In both cases, those high on external regulation/control showed higher levels of the coping strategy than did those who were low. Complementing the results from Table 7, these finding offered support for the detrimental effects of external regulation/control orientation on coping.

Across the three samples, there was a marginally significant interaction on avoidance. All other interactions were not significant ($ps > .12$). This interaction effect appears to be driven mainly by the significant interaction on avoidance in sample 1, which is graphed in Figure 8. Confirming the hypothesis, there is a nonsignificant positive relationship between PA and Avoidance for those high on external regulation ($\beta = .06, p = .40$), while there is a negative relationship for those low on external regulation ($\beta = -.17, p < .05$). The results for Sample 1 also showed a marginally-significant
interaction on self-punishment, which is graphed in Figure 9. Again confirming the hypothesis, there is a nonsignificant positive relationship between PA and Self-punishment for those high on external regulation ($\beta = .09, p = .20$), while there is a nonsignificant negative relationship for those low on external regulation ($\beta = -.11, p > .20$). In sample 2, there is a marginally-significant interaction on Accommodation, which is graphed in Figure 10. Contrary to the hypothesis, there is a positive relationship between PA and Accommodation for those high on external regulation ($\beta = .21, p < .05$), while there is no relationship for low on external regulation ($\beta = .01, p > .95$).

Out of the 30 analyses (3 Samples x 5 R-COPE scales x Intrinsic/External measures), there was one significant PA x Motivation X Gender interaction. In sample 3, there was a significant PA x Control x Gender interaction on Self-help ($\beta = -.13, p < .05$). There were also two marginally significant interactions in sample 1: a PA x Intrinsic x Gender interaction on Self-punishment ($\beta = -.12, p < .07$), and a PA x External Regulation x Gender interaction on Accommodation ($\beta = .12, p < .06$). These results may be due to chance, and will not be discussed further.

**Events**

The analyses of the events were identical to those of coping except that the dependent variables were now positive and negative competence-focused events and positive and negative relatedness-focused events. The top panel of Table 9 presents the partial correlations for the competence- and relatedness focused events analyses with intrinsic motivation serving as the motivational predictor. The bottom panel of table 9 presents parallel results for analyses with external regulation serving as the motivational predictor. As with Pilot Study 1, only results for the total (positive minus negative)
competence- and relatedness-focused events will be discussed here (significance of the effect of interest—the PA x Motivation interaction—was the same in analyses of only positive or only negative events and in analyses of total events).

For the competence-focused events, there was a significant main effect of gender such that females reported higher levels of such events than did males. There was no main effect for affect or for motivation ($p > .26$) and no significant PA x Intrinsic Motivation interaction ($p > .26$).

For the relatedness-focused events, there was no significant main effect for gender ($p > .40$). There was a significant main effect for PA. Those higher on PA reported greater relatedness-focused events than those low on PA. There was no significant main effect for motivation and no significant PA x Motivation interaction ($p > .17$).

Turning to analyses using external regulation as a predictor (see the bottom panel of Table 9) the results showed the same main effects for gender and PA but no main effect for motivation and no PA x External Regulation interaction.

**Combining sample 1 with Pilot Study 1.** The results from sample 1 were meta-analytically combined with the results from Pilot Study 1. The combined results are presented in Table 10 (top panel presents analyses using intrinsic motivation/autonomy as predictors and bottom panel presents results using external regulation /control orientation as predictors).

For the competence-related events, there is a significant main effect of gender. Females report more competence-focused events than do males. There was no significant main effect for PA or motivation ($p > .30$). Finally, there was a significant PA x Motivation interaction. Consistent with results obtained in Pilot Study 1, those high on
intrinsic motivation/autonomy had a stronger positive relationship between PA and competence-focused events than did those low on intrinsic motivation/autonomy.

For the relatedness-focused events, there is no significant main effect for gender or PA ($p > .29$). There was a significant main effect for motivation. Those higher on intrinsic motivation/autonomy reported more relatedness-focused events than did those who were low. There was no significant PA x Motivation interaction.

Turning to analyses using external regulation/control as predictors, the results for competence-focused events are highly consistent with those reported above, except there was no significant PA x Motivation interaction ($p > .76$). For the relatedness-focused events, the same gender main effect emerged but there also was a significant main effect for PA; those higher on PA reported more relatedness-focused events than those low on PA. There was no significant main effect for motivation ($p > .29$) and there was no significant PA x Motivation interaction ($p > .82$).

**Discussion**

The data did not provide strong support for the main hypotheses of this investigation. First, there was no support for the Fredrickson and Joiner (2002) findings that PA is related to greater adaptive coping. Looking at the meta-analysis, out of a total of 10 PA effects (5 R-COPE scales x 2 measures of motivation), only one marginal main effect of PA was found. However, this was a negative relationship with Self-punishment, a maladaptive form of coping, and PA. Fredrickson and Joiner found no relationships between PA and maladaptive forms of coping. Out of a total of five intrinsic motivation/autonomy orientation analyses, there were two marginally significant effects. In both cases (Approach and Accommodation), there is evidence that greater levels of
intrinsic motivation lead to greater adaptive coping. Out of five external
regulation/control analyses, there was one significant (Avoidance) and one marginally
significant (Self-punishment) main effect. Thus, there is evidence that greater levels of
extrinsic motivation are related to greater maladaptive coping. These results offer
support for the hypothesis that those who report greater autonomy and less control
orientation also report more adaptive and less maladaptive coping.

More importantly, there was only weak support for the proposed PA x Motivation
interactions on coping. Out of 10 interactions in the meta-analysis, there was only one
marginally significant PA x External Regulation/Control interaction on avoidance.
Looking at the samples separately, there was somewhat stronger support in Sample 1.
Out of 10 interactions in that sample, two (one only marginal) PA x External Regulation
interactions are in support of the main hypothesis. In Sample 2, there are two significant
interactions and two marginally significant interactions. Two of these interactions
partially support the hypothesis, while the other two contradict the hypothesis. Finally,
there were no significant interactions in sample 3.

Turning to the meta-analysis of the extended COPE scale presented in
Appendices D and E, out of a total of 36 interactions (18 scales x 2 measures of
motivation), there are two significant and two marginally significant interactions and 32
nonsignificant interactions. This number is close to the number of significant effects
expected by chance. Thus the analyses of the extended COPE did not reveal anything not
found by analyses of the R-COPE.

The analyses of the event data did not offer stronger findings. Out of four total
interactions in the meta-analysis (2 total event scales x 2 measures of motivation), only
one interaction was significant and in support of the hypothesis. However, this interaction was due almost entirely to the effect found in Pilot Study 1 and was not replicated in Sample 1. The failure to replicate in sample 1 is particularly disappointing because this was the sample that produced the strongest support for the hypothesis with regard to coping.

The above results were obtained in a longitudinal design that used measures of PA and motivation as the operationalization of the key theoretical construct. The next section describes attempts to test the same hypotheses using experimental design with experimental manipulation as the operationalization of the same constructs.
Chapter 3: Study 2

Study 2 used an experimental design to examine again the moderating role of autonomy in the relationship between PA and resource building. Due to its correlational nature, Study 1 cannot allow the inference of causal conclusions. Study 2 manipulated PA and motivational state (autonomy vs. control) to assess the impact of these variables on resource building. Consistent with past research, it was expected that participants who were induced to experience PA would show greater resources. It was also expected, however, that those induced to experience autonomous PA will show greater resources than those induced to experience controlled PA.

Study 2 investigated the effect of PA and motivational state on three distinct resources: creativity, perseverance/performance on cognitive tasks, and altruism. The review that follows shows that both PA and autonomy are independently related to higher levels of these resources. The unique question addressed by the current study was whether PA induced by an autonomous experience leads to greater resource building than PA induced by a controlled experience.

As previously discussed, there is evidence that PA and creativity are positively related. For example, Isen, Daubman, and Nowicki (1987) found that participants in a positive mood were more likely to complete the Duncker (1945) candle task and performed better on Mednick’s (1962) Remote Associates Test than those in a neutral mood, negative mood, or affect-less high arousal state (due to exercise). There is also evidence that intrinsic motivation leads to greater creativity (cf., Amabile, 1996). For example, Amabile, Phillips, and Collins (1994) found that professional artists showed less creativity in pieces of art that were commissioned (compared to noncommissioned
work) due to the increased constraint that the artists felt while creating the commissioned pieces.

PA also appears to lead to increased perseverance and performance on cognitive tasks. Kavanagh (1987) found that participants induced to experience a positive mood persisted longer on and were able to solve more anagrams correctly than those induced to experience a negative mood (there was no significant difference between positive and neutral mood even though it was in the expected direction). Erez and Isen (2002) found that participants who received a bag of candy (to induce positive affect) performed better on a series on anagrams than those who received no candy (neutral affect). There is also evidence that intrinsic motivation for a task will lead to increased perseverance, deeper processing, and better learning. For example, Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) found that having intrinsic goals (vs. extrinsic goals) or being in an autonomy-supportive (vs. controlling) environment led to students’ increased persistence and higher performance in learning materials from textbooks as well as greater persistence in the activities they learned about (recycling, Tai-bo).

Finally, there has been evidence linking PA to altruistic behavior. For example, Berkowitz (1987) induced participants to feel happy, neutral, or negative affect. They were then asked to help the experimenter catch up on work he had been assigned by summing scores on data sheets. It was found that participants induced to experience PA summed significantly more pages of data than those in the neutral group. The participants in the neutral group summed more pages than those in the NA group although this difference failed to reach traditional levels of significance. There is also evidence that autonomy is related to greater altruism. In two studies, Gagné (2003)
investigated the relationship between autonomy orientation and altruistic acts (e.g., volunteering for nonprofit organizations, donating food, furniture, blood and clothing) as well as the number of hours spent volunteering. It was found that those higher on autonomy orientation were more likely to engage in altruistic acts (Study 1) and to spend more time doing volunteer work (Study 2).

The following two studies tested the hypothesis that autonomous PA leads to the greatest amount of resource building when compared to controlled PA and neutral affect. The methods for inducing affect and motivational state differed across studies (imagining academic scenarios in Study 2a and reading a series of statements in Study 2b). However, each study included the same measures of creativity, perseverance/performance, and altruism.

*Study 2a Method*

*Overview*

PA and motivational orientation were manipulated by having participants imagine academic scenarios intended to induce either autonomous positive, controlled positive, or neutral affect. Participants then completed measures of creativity, perseverance/performance, and altruism. It was expected that autonomously induced PA would result in higher scores on each of these variables than controlled PA or neutral mood. No prediction was made about potential differences between controlled PA and neutral mood conditions.
Participants

Ninety-three (17 males and 76 females) undergraduates from the University of Rochester and Nazareth College (37 and 56 participants, respectively) participated in this study in exchange for extra credit in their psychology courses.

Procedure

Participants were run individually. Upon arrival, participants sat at a computer where they completed most of the study (with the exception of the altruism measures). Participants were told that they would be participating in a study about their perceptions of their classes and their goals in college. They were going to read some statements about college and their goals and then answer some questions about those statements. First, participants’ mood and motivational state were induced through imaginary scenarios. Once participants completed the mood induction, they completed (respectively) the measures of creativity and perseverance/performance. Next, participants completed manipulation checks and were told they were done with the session. However, they were asked to sign up for another study or a blood donation drive (two measures of altruism). Once participants completed all measures, they were debriefed about the procedures and any questions were answered.

Materials

Affect and motivation induction. In this study, the procedure for affect induction was to have participants imagine positive scenarios (or neutral scenarios) and focus on the feelings that they bring up. This procedure has been used successfully to induce PA in previous research (cf., Wright & Mischel, 1982; Urada & Miller, 2000). Unlike previous research, however, the current study induced both affect and motivational state
(control vs. autonomy) in these scenarios. Specifically, participants read one of three academic scenarios based on Nix, Ryan, Manly and Deci (1999). Participants in the autonomous PA condition were asked to imagine taking a class that is not required for their major but one that attracts their interest. They were further asked to imagine performing well on the midterm exam (as evidence that they are really learning the material). Participants in the control PA condition were asked to imagine taking a class that is required for their major and covers a topic that does not interest them. They were then asked to imagine performing better than most of their classmates on the midterm. Participants in the neutral condition were asked to imagine taking a regular class (neither interesting nor uninteresting) that is required for their major. They were further asked to imagine a typical day in that class (see Appendix F for the full description of each scenario). All participants were given 10 minutes to read the scenarios, think about what it would be like to be in that situation focusing on what they feel rather than the concrete details of the situation, and to write about it. They were told that they would be asked more questions about these scenarios later, so they need to keep them in mind while they complete the next two studies.

Creativity. The procedure for measuring creativity—the brick test—was based on the Torrance Tests of Creative Thinking (Torrance, 1966) and has been previously used as a measure of creativity (cf. Freidman & Förster, 2000; 2001; 2002; 2005). Participants were given one minute to list as many creative uses of a brick they could think of (avoiding mundane and impossible uses; information on scoring of the creativity data is presented in the Results).
**Perseverance/Performance.** Participants were asked to solve 12 difficult five-letter anagrams (word puzzles that require participants to rearrange scrambled letters to from a word; e.g., LFIGN: FLING). Pretesting of the 12 anagrams showed that they were solved by 25% to 50% of participants (a total of 115 participants were included in the pretesting sessions). Participants were given a total of 12 minutes to complete the 12 anagrams (which has been shown to be enough time for 90% of participants to complete or decide to give up on these anagrams). For each anagram, participants were presented with the scrambled letters on the computer screen along with a blank space. Participants could either enter their solution or type “skip” to move on to the next anagram.

**Altruism.** After participants completed all other portions of the study, they were told that they were done. The experimenter then told them that they have a favor to ask. In one condition, the experimenter said that they have a friend who is looking to run a study but is unable to get it approved to be run for credit. Then, the experimenter asked if the participant would be willing to sign up to complete the study without receiving compensation (Aderman, 1972). In the second condition, participants were told that the school has an upcoming blood drive, and they are trying to find new ways of recruiting people to give blood. Therefore, they have asked the experimenter to recruit people who show up to their study (O’Malley & Andrews, 1983).

**Manipulation Checks.** PA and NA were assessed by the PANAS ($\alpha$s = .93 & .75, respectively; Watson et al., 1988) with instructions to rate how they feel right now. Participants’ sense of vitality was assessed by the Vitality Scale ($\alpha$ = .86; Ryan & Fredrick, 1997). Participants rated on a scale of 1 (not at all true) to 7 (very true) the extent to which a list of seven statements were true for them right now (e.g., I feel a live
and vital; see Appendix G for the full scale). Participants’ sense of autonomy and control was assessed by asking participants to think back to the scenarios they imagined in the first portion of the study. They were then asked to rate on a scale of 1 (not at all true) to 7 (very true) how true the following statements were for their experience from the start of the study up to this minute. In order to assess their sense of autonomy, participants rated how true the statement “Much of what I felt had to do with experiences of interest, growth, learning, and self-actualization” was for them. In order to assess their sense of control, participants rated how true the statement “Much of what I felt had to do with experience of doing better than others, achieving high status, gaining prestige, and having people admire/look up to me” was for them.

*Study 2b Method*

*Overview*

Study 2b was identical to Study 2a with the exception of the affect and motivational state induction stimuli. The participants were from the same population as those in Study 2a, and the general procedure remained the same. However, instead of imagining academic scenarios, participants read a series of statements based on the procedure proposed by Velten (1968). The goal of inducing affect/motivation in two different procedures was to increase the generalizability of results. A secondary purpose was to increase the chances that at least one of the procedures will be successful in inducing the affect/motivational state they were meant to create.
Participants

Ninety-three (14 males and 79 females) undergraduates from the University of Rochester and Nazareth College (36 and 57 participants, respectively) participated in this study in exchange for extra credit in their psychology courses.

Materials

Affect and motivation induction. In order to manipulate affect and motivational state, participants were asked to read one of three series of statements based on the procedure developed by Velten (1968) and used in previous research to induce affect (cf., Murray, Sujan, Hirt, & Sujan, 1990; Hirt, Melton, McDonald, & Harackiewicz, 1996; Schüettler & Kiviniemi, 2006). Unlike previous research, however, both affect and motivational state were induced in these statements. Participants were given 28 statements intended to induce either positive affect based in autonomous pursuits or intrinsic goals (e.g., It’s encouraging that as I get farther into my major, the classes get so much more interesting), positive affect based in controlled pursuits or extrinsic goals (e.g., This might turn out to be the kind of day my parents would like me to have), or neutral affect (e.g., Many states supply milk for grammar school children; see Appendix H for a full list of the statements). Each statement appeared on the computer screen for 20 seconds and participants read the statement aloud and concentrated on it until the next statement appeared. Prior to being used in this study, the autonomy and control statements were selected from a list of 76 statements rated by approximately four graduate students familiar with Self-Determination Theory to assess the extent to which they assessed an autonomous (α = .86; 1 = not at all autonomous to 7 = very autonomous)
and controlled experience ($\alpha = .89$; $1 = \text{not at all controlled} \text{ to } 7 = \text{very controlled}$). The statements selected were those that had the highest difference between the two ratings.

**Creativity, perseverance/performance, altruism, and manipulation checks.** All dependent measures and manipulation checks were the same as those used in Study 2a ($\alpha$s $= .93$, .80, and .83 for PA, NA, and vitality, respectively; see Appendix G for the full list).

**Results**

**Overview**

The results are divided into two sections, one presenting the results for Study 2a (academic scenarios) and the other presenting the results for Study 2b (Velten statements). The following four dependent variables were calculated for both studies. a) Perseverance: For those participants who skipped at least one anagram ($N_s = 69$ and 70 in Study 2a & 2b, respectively), the time to decide to skip was measured and log-transformed, and the mean for each participant was taken to serve as the measure of persistence. b) Performance: Number of anagrams correctly solved within the allotted time. c) Creativity: Participants’ responses to the brick task were rated on a 1 (not at all creative) to 7 (very creative) scale by 12 independent judges ($\alpha = .80$). The mean ratings across judges yielded a creativity score for each participant. d) Altruism: Participants were given a score of 1 if they agreed (to either participate in a friend’s study or to give blood) or a 0 if they did not agree; means for altruism, therefore, represent the percent of participants who agreed. In both studies, the manipulation checks were composed of participants’ scores on the vitality, PA, and NA scales as well as their responses to the autonomous and controlled motivation items.
In both samples, all dependent variables and manipulation checks were submitted to a 3 (Condition) x 2 (School) x 2 (Gender) between-subject ANOVA (altruism data included an extra factor for type of request made: a friend’s study vs. blood donation). If found to be significant (or close to significant), the omnibus condition main effect was further analyzed with two orthogonal contrasts. The first contrast compared the Neutral condition to the two PA conditions (Autonomous PA and Controlled PA). The second contrast compared the two PA conditions. Any other main effects or interactions will only be mentioned when significant. Interactions not relevant to the current investigation (e.g., School x Gender) will not be described in detail.

**Study 2a**

**Manipulation Checks.** Table 11 presents the correlations among all study dependent variables and manipulation checks. The top panel of Table 12 presents the means for the manipulation checks across the three experimental conditions. There were no significant main effects for condition on any of the manipulation checks (all $F$s < 1.15). There was one significant School x Condition interaction on autonomous motivation ($F(2, 81) = 3.09, p = .05$), indicating that the difference between the Neutral and the two PA conditions was smaller at the University of Rochester; however, in neither location was there a significant differences among conditions. Given that the scenario manipulation failed to induce differences in affect or motivational orientation, it was unlikely to have any effect on the study dependent variables.

**Dependent Variables.** The bottom panel of Table 12 presents the means for the dependent variables across the three experimental conditions. There were no significant main effects of condition on any of the dependent variables ($F$s < 1).
Turning to other effects, there was a significant main effect of school on creativity \((F (1, 81) = 4.27, p < .05)\). Participants at Rochester were significantly more creative \((M = 2.69)\) than were participants at Nazareth \((M = 2.46)\). There was also a significant main effect of the type of request made \((F (1, 71) = 5.63, p < .05)\) on altruism. Participants asked to participate in a friend’s study were significantly more likely to agree \((M = .96)\) than were those asked to donate blood \((M = .45; \text{all other effects } ps > .08)\).

**Study 2b**

*Manipulation Checks.* Table 13 presents the correlations among all study dependent variables and manipulation checks. The top panel of Table 14 presents the means for the manipulation checks across the three experimental conditions, and the top panel of Table 15 presents the \(F\) test and effect size for the condition main effect as well as the follow-up contrasts. There was a marginally significant main effect for vitality \((p < .07)\). As can be seen by the contrasts, participants in the two PA conditions experienced significantly higher levels of vitality than did those participants in the Neutral condition. However, the two PA conditions did not differ significantly from one another \((p = .25)\). There were no other significant effects involving vitality \((ps > .24)\).

There was a significant main effect of condition on PA levels. Again, participants in the two PA conditions experienced significantly greater PA than did those in the Neutral condition, but the two PA conditions did not differ significantly from each other \((p = .28)\). No other main effects or interactions were significant \((ps > .07)\). There was a significant main effect of condition on NA levels. Participants in the two PA conditions experienced significantly lower NA levels that did those in the Neutral condition, but they did not significantly differ from each other \((p = .58)\). There was a significant main
effect of school on NA ($F(1, 82) = 4.98, p < .05$). Participants from Nazareth College experienced significantly lower levels of NA ($M = 1.89$) than did participants at the University of Rochester ($M = 2.02$). There was also a significant School x Condition interaction ($F(1, 82) = 7.16, p = .001$), indicating that the difference in NA between the Neutral and the two PA conditions was greater at the University of Rochester than at Nazareth. There was a significant Condition x Gender ($F(1, 82) = 3.08, p = .05$) interaction, indicating that the difference in NA between the Neutral and the two PA conditions was greater among males than among females. Finally, there was a significant School x Condition x Gender interaction ($F(1, 82) = 10.08, p < .01$). Given the difficulty of interpreting three-way interactions, and the likelihood that this result is due to chance (only one significant three-way interaction out of eighteen possible in Studies 2a and 2b), this interaction will not be described more fully here. In summary, it appears that the Velten manipulation succeeded in inducing better mood and higher vitality in the two PA conditions relative to the Neutral condition.

There was a significant condition main effect on autonomous motivation. Participants in the two PA conditions experienced significantly higher levels of autonomous motivation than did those in the Neutral condition, but the two PA conditions did significantly differ from each other ($p = .93$). There was also a significant School x Gender interaction ($F(1, 82) = 4.20, p < .05$). At Nazareth, females felt more autonomous than males whereas the opposite was true at Rochester. There were no other significant main effects or interactions ($ps > .07$).

There was a significant condition main effect on controlled motivation. Participants in the two PA conditions felt significantly more controlled than did those in
the Neutral condition, but they did not significantly differ from each other ($p = .32$).

There were no other significant effects ($ps > .06$; there was a school main effect at $p < .06$ while all other effects were much weaker, $p > .34$).

Note that although the two PA conditions did not differ significantly on the motivational manipulation checks, the direction of their differences were in the predicted direction—participants in the autonomous PA condition reported greater autonomy and lower control orientation than did participants in the controlled condition.

**Dependent Variables.** The bottom panel of Table 14 presents the means for the four dependent variable across the three experimental conditions, and the bottom panel of Table 15 presents the $F$ test and effect size for the condition main effect as well as the follow-up contrasts. There were no significant main effects, contrasts or interactions for perseverance ($ps > .31$; similar results were obtained with untransformed data). There was a significant main effect of condition on performance. Follow-up contrasts revealed that participants in the two PA conditions performed marginally better than participants in the Neutral condition ($p < .07$) and that participants in the autonomous PA condition performed significantly better than participants in the controlled PA condition. There were no other significant main effects or interactions ($ps > .09$).

There was no significant main effect of condition on creativity ($p = .16$). However, inspection of the contrasts revealed that while participants in the two PA conditions were not significantly more creative than participants in the Neutral condition ($p = .37$), participants in the autonomous PA condition were marginally more creative than participants in the controlled PA condition ($p < .07$). There were no other significant main effects or interactions on creativity ($ps > .07$).
There was a marginally significant main effect of condition on altruism \( (p < .09) \). Follow-up contrasts revealed that participants in the two PA conditions were not significantly more altruistic than participants in the Neutral condition \( (p = .68) \), but participants in the autonomous PA condition were significantly more altruistic than participants in the controlled PA condition. There was a significant main effect for school \( (F(1, 72) = 5.15, p < .05) \). Participants at Nazareth were significantly more altruistic \( (M = .82) \) than participants at Rochester \( (M = .61) \). There was also a significant main effect for gender \( (F(1, 72) = 4.43, p < .05) \). Females were significantly more altruistic \( (M = .75) \) than were males \( (M = .71) \). Finally, there was a significant main effect for request made \( (F(1, 72) = 21.48, p < .001) \). Participants were significantly more willing to sign-up to participate in a friend’s study \( (M = .96) \) than they were to donate blood \( (M = .52) \). There were significant School x Request \( (F(1, 72) = 4.13, p < .05) \) and Gender x Request \( (F(1, 72) = 5.27, p < .05) \) interactions. The increased willingness to participate in the friend’s study compared to blood donation was more pronounced at the University of Rochester and for males. There were no other significant effects on altruism \( (ps > .12) \).

**Discussion**

The data provided partial support for the main hypotheses of this study. Study 2a did not offer support, probably because the experimental manipulations failed to produce the predicted changes in mood and in motivation. However, Study 2b did offer some support for the hypotheses. The manipulation checks in Study 2b showed that the manipulation of PA was successful. Participants in the two PA conditions were significantly higher on PA than were participants in the neutral condition (as shown in the
contrast 1 column in Table 13). One caveat to this finding is that this study did not replicate Nix et al. (1999) who found that participants who were induced to experience an autonomous PA experienced greater vitality (but not PA) than those induced to experience a controlled PA; autonomous and controlled PA did not differ in the current study on either measure. Still, the current manipulation of PA appears successful.

The manipulation of motivation was not as successful. While the means were in the expected direction, participants in the Autonomous PA condition did not experience significantly more autonomy or less control than did participants in the Controlled PA condition. One potential explanation for why no differences were found may be the manipulation checks themselves. The motivation manipulation checks were developed for this study and have not been used in any other study. Each manipulation check was assessed with a single item and, contrary to what might be expected, the two measures were positively and significantly correlated ($r = .30$ & $.47$ in Studies 2a and 2b, respectively; $p < .001$). Future research should focus on developing better measures of motivational state. However, there was some evidence that participants in the Autonomous PA condition felt at least somewhat more autonomous and less controlled than participants in the Controlled PA condition.

Out of four dependent variables measured in Study 2b, three supported the main hypothesis. Participants induced to experience autonomous PA performed better, were marginally more creative, and were more altruistic (but not more perseverant) than those who were induced to experience controlled PA. However, the data did not support the hypothesis that both PA conditions would lead to enhancements over the Neutral condition on these variables (with the exception of the marginal effect on performance).
This lack of result appears mostly due to controlled PA. Specifically, except for performance, participants in the Controlled PA condition scored the same (perseverance) or worse (creativity, altruism) than did participants in the Neutral condition (additional analyses failed to show any significant differences between these groups on the dependent variables). These findings may indirectly support the main hypothesis of this investigation; controlled PA did not lead to resource building and was outdistanced by autonomous PA on three of the four dependent variables (although one of those three differences only approached significance).
Chapter 4: General Discussion

The present investigation examined the hypothesis that autonomy moderates the relationship between happiness and resource building. Specifically, happiness coupled with an autonomous experience was expected to lead to greater resource building than happiness coupled with a controlling (or less autonomous) experience. This hypothesis was based on the work of the Broaden-and-Build model of emotions (Fredrickson, 1998), which proposes that happiness contributes to resource building through the experience of personal growth, and SDT (Ryan & Deci, 2000), which proposes that need fulfillment is necessary for growth.

Summary of Results

Pilot Study 1 tested the moderating role of autonomy in the relationship between happiness and level of competence and relatedness (Ryan & Deci, 2000). Competence and relatedness were assessed by both an inventory as well as by report of events. Autonomy moderated the relationship between happiness and competence-focused events but not between happiness and the inventory of competence. Autonomy also moderated the relationship between happiness and the inventory of relatedness (loneliness) but not between happiness and relatedness-focused events. In both instances, higher autonomy was related to a stronger connection between happiness and need fulfillment.

Pilot Study 2 tested the moderating role of self-determination in the relationship between happiness and two other indicators of growth. Those higher on self-determination had a marginally stronger relationship between happiness and Ryff’s (1989) Psychological Well-Being scale. The subscales most responsible for this relation were personal growth and environmental mastery. These scales measure constructs that
are most consistent with SDT’s (Ryan & Deci, 2000) and Broaden-and-Build’s (Fredrickson, 1989) view of growth. Additionally, those high on self-determination showed a stronger relationship between happiness and a composite of creativity and inspiration.

Study 1 tested the moderating role of autonomy on the relationship between happiness and coping strategies across three distinct samples. It was hypothesized that those who were higher on autonomy would show a stronger relationship between happiness and adaptive forms of coping (Self-help, Approach, Accommodation) while either showing no different or a weaker relation between happiness and maladaptive coping (Avoidance, Self-punishment). When looking across all three samples, there was no consistent evidence that autonomy moderated the happiness-coping relationship. One of the three samples was used to re-test the relationship between happiness and life events. There was no evidence that autonomy moderated this relationship (even when combined with the results from Pilot Study 1).

Study 2 experimentally manipulated affect and motivational state to see if autonomy affected the relationship between happiness and a number of resources (perseverance, performance, creativity, and altruism). Two manipulations of affect and motivation were attempted. In Study 2a, participants read academic scenarios (similar to those used by Nix et al., 1999) that were designed to influence affect and motivation. In Study 2b, participants read statements (similar to those developed by Velten, 1967) that were also designed to influence affect and motivation. The academic scenarios manipulation failed to induce differences in either happiness or autonomy and, therefore, could not be expected to produce differences in the dependent variables. Indeed, the
experimental conditions did not produce differences in any of the dependent variables. The Velten statements led to a significant difference in affect with those in the positive affect groups experiencing greater positive and lower negative affect than participants in the neutral affect group. However, there was no difference between the autonomous and control orientation groups on either measure of motivational state. Turning to the main analyses, the two positive affect groups were significantly different on two of the dependent variables (performance and altruism) and marginally significantly different on creativity. All of the above effects (in Study 2b) were in the expected direction.

Lingering Questions

Happiness Main Effects. One unexpected set of findings was the lack of happiness main effects on the dependent variables across studies. In the longitudinal studies (Pilot Studies 1 and 2 and Study 1), PA did not predict a significant portion of the variance in any of the outcome variables. Similarly, (with the exception of the marginal contrast effect on performance in Study 2b) the manipulation of affect failed to produce any significant differences in the Study 2 dependent variables. There are at least two potential explanations for this lack of findings.

First, the lack of an affect main effect may be a methodological issue. It is possible that affect was not measured accurately. This is an unlikely explanation for the lack of results. Affect was assessed in the pilot studies using a 10-item measure that was used successfully in previous research (Zuckerman & O’Loughlin, 2006). The PANAS (Watson et. al, 1988) served as the measure of affect in all three of the Study 1 samples. Finally, affect was manipulated in Study 2 using two different previously successful inductions (and checked by using the PANAS and Vitality Scale; Ryan & Fredrick,
Given the diverse methodologies and measures used across studies, it seems unlikely that they share the same methodological flaw that would account for the null results.

A second potential explanation is that the lack of happiness main effects accounts for the failure to find support for the moderating role of autonomy in such effects. It should be noted, however, that happiness main effect and Happiness x Autonomy interactions are statistically independent and the absence of one effect does not imply the absence of the other. Indeed, in some of the studies reviewed above, there was evidence of Happiness x Autonomy interaction in spite of the lack of happiness main effects. Still, in view of the strong evidence of the link between happiness and resource building in the literature (cf. Lyubomirsky et al., 2005), the failure to find similar evidence in the current studies is troubling. At the very least, if the failure to find happiness main effects is not to be trusted (because the literature clearly shows that such main effects exist), perhaps the failure to find Happiness x Autonomy interaction is not to be trusted either. This explanation implies, of course, that a common element explains both null results. Unfortunately, it is not clear what this common element might be.

**Motivation Manipulation.** Another null result, limited to Study 2b, was the lack of significant difference between the autonomous PA and controlled PA groups on the manipulation checks assessing motivational state. Both of these groups experienced a higher sense of autonomy and control than did the neutral affect group, but they did not differ significantly from each other (although the effects were in the expected direction). However, differences were found between these two groups on three of the four
dependent variables (one of which only was marginally significant). How might these contradictory results be explained? Again, there are at least two potential explanations.

First, it is possible that a third variable (one other than motivation) caused the differences in dependent variables between the groups. This would explain why a difference between the two groups was found on the dependent variables but not on the manipulation checks of motivation. Given that the same base statements were used, and only the motivational aspect of the goal was altered for the two conditions, this is an unlikely (although not impossible) explanation.

A second (and more likely) explanation for the lack of difference on the motivation manipulation checks lies with the checks themselves. Perhaps the measure of motivation was not suitable for the current purpose. Both autonomous and controlled orientations were assessed by single items that were written for this study. There is no body of literature supporting their validity, and no checks of reliability could be done in the present investigation. Another possibility is that people cannot assess their motivational states accurately, at least not in response to the statements that were used. Given that the differences on the manipulation check were in the expected direction (the autonomous PA group was higher on autonomy and lower on control than the controlled PA group), it is likely that the manipulation check was assessing motivational state but not was not sensitive enough to pick up the differences between the two conditions.

Does Autonomy Moderate the Happiness-Resource Building Relationship?

The most important question at this point is whether the main hypothesis of this investigation has been supported. Unfortunately, a clear answer cannot be given at this point. There is certainly evidence that autonomy did moderate the relationship between
happiness and some types of resource building. Pilot Study 1 found a relation with competence and relatedness, Pilot Study 2 found a relation with eudaimonia (marginally) and creativity, and Study 2b found a significant effect on two dependent variables (and one marginal). However, Study 1 did not find any consistent evidence that coping was impacted by the unique combination of happiness and autonomy. Importantly, there was no evidence that autonomy moderates the effects of happiness in a direction opposite to the hypothesis. It might be concluded that the present studies provide some very limited support to the hypothesis. In this context, the traditional call for more research is truly justified.

*Future Directions*

One possible direction for future research is the use of different methodologies to manipulate affect. For example, one may try to use videotapes to elicit both happiness and the appropriate motivational state (c.f., McClelland & Cheriff; 1997). Alternatively, it might be possible to manipulate affect and motivation through the use of priming (c.f., Levesque & Pelletier, 2003; Murphy & Zajonc, 1993). It also will be important to use better manipulation checks for motivation than what was used in Study 2b. Additionally, the present investigation focused on some but not all of the resources that happiness might influence. Based on Study 1, it is possible that the present hypothesis does not apply to coping but might apply to other personal or interpersonal spheres. Those may include physical health or other physiological markers (such as heart rate; Fredrickson et al., 2000), relationships or other social outcomes (Cunningham, 1988a), success in professional spheres (Staw et al., 1994), and various personality attributes (e.g., self-esteem). It may be found that some of these relationships are not impacted by autonomy.
(such as coping in the present case) while some are (such as creativity or performance in the present case). Such differential results will open the field to more interesting questions such as which happiness-resource relationships are affected by autonomy and which are not. Of course, this pattern of results will give rise to the question of why some happiness effects are moderated by autonomy while others are not.

Concluding Remarks

The present work attempted to extend the research linking happiness to a more successful life by showing that those who are able to gain happiness through more autonomous routes are able to attain the greatest success. This research direction would add to the growing literature stressing the importance of a life that fulfills basic psychological needs and would open up a new avenue for research on both SDT and the nature and consequences of happiness. Hopefully, future studies will support and expand the theory that this investigation has begun to examine.
References


Goldblum, R. M. (1990). The role of IgA in local immune protection. *Journal of Clinical Immunology, 10*, 64S-70S.


Endnotes

1 All analyses were also run with control orientation. None of the analyses revealed a significant interaction. However, control orientation may still prove important in future studies.

2 Highly similar results were obtained when mean inspiration and mean creativity were analyzed separately.

3 Only one PA x Self-determination x Gender interaction reached conventional levels of significance: Positive Relations with Others ($p = .048$). Since this was not expected a priori, and considering the large number of analyses run, it will not be discussed further.
Table 1: Predicting PWB from PA and the SDS

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<th>Growth F</th>
<th>Relations F</th>
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<td>.04</td>
<td>2.77†</td>
<td>.09</td>
<td>.63</td>
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<tr>
<td>PA x Awareness</td>
<td>1.52</td>
<td>.06</td>
<td>1.43</td>
<td>.05</td>
<td>1.62</td>
<td>.06</td>
<td>2.44</td>
</tr>
</tbody>
</table>

*Note: The F tests are on the increment of the variance uniquely accounted for by the predictor in question. The df associated with each F were 1,243 or 1,244.
† p ≤ .10. * p ≤ .05. ** p ≤ .01
Table 2: Predicting Inspiration and Creativity for PA and the SDS

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Time 2 Inspiration</th>
<th>Creativity Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( F )</td>
<td>( \beta )</td>
</tr>
<tr>
<td>PA</td>
<td>.38</td>
<td>-.04</td>
</tr>
<tr>
<td>SD</td>
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<tr>
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<td>2.63†</td>
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</tr>
<tr>
<td>PA</td>
<td>.53</td>
<td>-.04</td>
</tr>
<tr>
<td>Choice</td>
<td>.50</td>
<td>.04</td>
</tr>
<tr>
<td>PA x Choice</td>
<td>4.94*</td>
<td>.11</td>
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<tr>
<td>PA</td>
<td>.17</td>
<td>-.02</td>
</tr>
<tr>
<td>Awareness</td>
<td>.03</td>
<td>-.01</td>
</tr>
<tr>
<td>PA x Awareness</td>
<td>.30</td>
<td>.03</td>
</tr>
</tbody>
</table>

Note: The \( F \) tests are on the increment of the variance uniquely accounted for by the predictor in question. The \( df \) associated with each \( F \) were 1,243 or 1,244 for Follow-up Inspiration, 1,271 or 1,270 for the creativity composite.

a Analyses only control for baseline levels of inspiration

† \( p \leq .10 \)* \( p \leq .05 \)** \( p \leq .01 \)**\( p \leq .001 \)
### Table 3. Subscales of the Original and Extended COPE

<table>
<thead>
<tr>
<th>Scale</th>
<th>Sample Item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Original COPE</strong></td>
<td></td>
</tr>
<tr>
<td>Active coping</td>
<td>I took additional action to try to get rid of the problem.</td>
</tr>
<tr>
<td>Planning</td>
<td>I tried to come up with a strategy about what to do.</td>
</tr>
<tr>
<td>Suppression of competing</td>
<td>I put aside other activities in order to concentrate on this.</td>
</tr>
<tr>
<td>activities</td>
<td></td>
</tr>
<tr>
<td>Restraint coping</td>
<td>I forced myself to wait for the right time to do something.</td>
</tr>
<tr>
<td>Seeking social support—</td>
<td>I asked people who had similar experiences what they did.</td>
</tr>
<tr>
<td>instrumental</td>
<td></td>
</tr>
<tr>
<td>Seeking social support—</td>
<td>I talked to someone about how I felt.</td>
</tr>
<tr>
<td>emotional</td>
<td></td>
</tr>
<tr>
<td>Positive reinterpretation &amp;</td>
<td>I looked for something good in what was happening.</td>
</tr>
<tr>
<td>growth</td>
<td></td>
</tr>
<tr>
<td>Acceptance</td>
<td>I learned to live with it.</td>
</tr>
<tr>
<td>Turning to Religion</td>
<td>I sought God’s help.</td>
</tr>
<tr>
<td>Focus on &amp; venting of emotions</td>
<td>I got upset and let my emotions out.</td>
</tr>
<tr>
<td>Denial</td>
<td>I refused to believe it had happened.</td>
</tr>
<tr>
<td>Behavioral disengagement</td>
<td>I gave up the attempt to get what I wanted</td>
</tr>
<tr>
<td>Mental disengagement</td>
<td>I turned to work or other substitute activities.</td>
</tr>
<tr>
<td>Alcohol-drug disengagement†</td>
<td>I drank alcohol or took drugs, in order to think about it less.</td>
</tr>
<tr>
<td><strong>Extended COPE</strong></td>
<td></td>
</tr>
<tr>
<td>Self-blame</td>
<td>I blamed myself.</td>
</tr>
<tr>
<td>Self-focused rumination</td>
<td>I thought about my problem constantly.</td>
</tr>
<tr>
<td>Expressing emotion</td>
<td>I took time to express my emotions.</td>
</tr>
<tr>
<td>Understanding emotion</td>
<td>I worked on understanding my feelings.</td>
</tr>
<tr>
<td>Maintaining optimism</td>
<td>I tried to be optimistic in spite of what happened.</td>
</tr>
<tr>
<td>Goal replacement</td>
<td>I sought another goal, something else to strive for.</td>
</tr>
<tr>
<td>Other-blame</td>
<td>I blamed someone or something for what happened to me.</td>
</tr>
<tr>
<td><strong>Revised Scale</strong></td>
<td></td>
</tr>
<tr>
<td>Mental Disengagement</td>
<td>I tried not to think about it.</td>
</tr>
</tbody>
</table>

*This subscale only contains the one item listed. All other subscales contain four items.*
<table>
<thead>
<tr>
<th>R-COPE Subscale</th>
<th>Original Subscale</th>
<th># items from scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-help</td>
<td>Expressing emotion</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Seeking social support—emotional</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Seeking social support—instrumental</td>
<td>1</td>
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<tr>
<td>Approach</td>
<td>Active coping</td>
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<tr>
<td></td>
<td>Planning</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Suppression of competing activities</td>
<td>1</td>
</tr>
<tr>
<td>Accommodation</td>
<td>Maintaining optimism</td>
<td>3</td>
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<tr>
<td></td>
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<td>2</td>
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<td></td>
<td>Positive reframing</td>
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<tr>
<td></td>
<td>Replacement</td>
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</tr>
<tr>
<td>Avoidance</td>
<td>Denial</td>
<td>3</td>
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<tr>
<td></td>
<td>Behavioral disengagement</td>
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<tr>
<td></td>
<td>Other-blame</td>
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<tr>
<td></td>
<td>Mental disengagement</td>
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</tr>
<tr>
<td>Self-punishment</td>
<td>Self-blame</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Self-focused rumination</td>
<td>4</td>
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</table>
Table 5. Measures included in each Study 1 sample.

<table>
<thead>
<tr>
<th>Sample</th>
<th>$N$ ($N$ females)</th>
<th>Positive Affect</th>
<th>Autonomy</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| 1      | 305 (209)        | PANAS PA        | Academic Motivation Scale | 82-item COPE  
<p>|        |                  |                 |          | 34-item Event Scale |
| 2      | 264 (146)        | PANAS PA        | Academic Motivation Scale | 72-item COPE |
| 3      | 238 (154)        | PANAS PA        | General Causality Orientation Scale | 82-item COPE |</p>
<table>
<thead>
<tr>
<th>Scale</th>
<th>Sample 1</th>
<th></th>
<th></th>
<th>Sample 2</th>
<th></th>
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<td>T1 α</td>
<td>T2 α</td>
<td>T1 α</td>
<td>T2 α</td>
<td>T1 α</td>
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<td>.75</td>
<td>.68</td>
<td>.72</td>
<td>.70</td>
<td>.69</td>
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<tr>
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<td>Other Blame</td>
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<td>--</td>
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<td>Self-Punishment¹</td>
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</tbody>
</table>

¹ Sample 2 scales based on different item numbers than Samples 1 and 3
Table 7. Predicting coping from Gender, PA, Intrinsic Motivation/Autonomy, and PA x Intrinsic Motivation/Autonomy

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
<th>Affect</th>
<th>Motivation</th>
<th>Affect x Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-help</td>
<td>-.19***</td>
<td>.03</td>
<td>-.02</td>
<td>.05</td>
</tr>
<tr>
<td>Approach</td>
<td>-.13*</td>
<td>-.01</td>
<td>.06</td>
<td>-.04</td>
</tr>
<tr>
<td>Accommodation</td>
<td>-.15**</td>
<td>-.02</td>
<td>.09</td>
<td>-.05</td>
</tr>
<tr>
<td>Avoidance</td>
<td>-.05</td>
<td>-.08</td>
<td>.09</td>
<td>.02</td>
</tr>
<tr>
<td>Self-Punishment</td>
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<td>-.02</td>
<td>.06</td>
<td>-.04</td>
</tr>
<tr>
<td>Sample 2</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Self-help</td>
<td>-.17*</td>
<td>-.09</td>
<td>.06</td>
<td>.13*</td>
</tr>
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<td>Approach</td>
<td>-.14*</td>
<td>.02</td>
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<td>.07</td>
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<td>.15*</td>
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<td>Sample 3</td>
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<td>-.01</td>
<td>-.08</td>
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<tr>
<td>Approach</td>
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<td>.04</td>
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<tr>
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<td>.04</td>
<td>-.02</td>
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<td>Avoidance</td>
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<td>-.09</td>
<td>.04</td>
<td>.05</td>
</tr>
<tr>
<td>Self-Punishment</td>
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<td>-.09</td>
<td>.11</td>
<td>.09</td>
</tr>
<tr>
<td>All samples combined</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-help</td>
<td>-.16***</td>
<td>-.00</td>
<td>.01</td>
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<td>Approach</td>
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<td>.03</td>
<td>.07†</td>
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<td>-.11*</td>
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<td>Avoidance</td>
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<td>Self-Punishment</td>
<td>.02</td>
<td>-.06†</td>
<td>.06</td>
<td>.05</td>
</tr>
</tbody>
</table>

Note. Each of the table’s values represents the partial correlation between the predictors and the dependent variable controlling for all other variables included at that step.

†  $p < .10$
*  $p < .05$
** $p < .01$
*** $p < .001$
Table 8. Predicting coping from Gender, PA, External Regulation/Control, and PA x External Regulation/Control

<table>
<thead>
<tr>
<th>Sample 1</th>
<th>Gender</th>
<th>Affect</th>
<th>Motivation</th>
<th>Affect x Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-help</td>
<td>- .19***</td>
<td>.01</td>
<td>-.02</td>
<td>-.09</td>
</tr>
<tr>
<td>Approach</td>
<td>-.13*</td>
<td>.01</td>
<td>.08</td>
<td>-.06</td>
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<tr>
<td>Accommodation</td>
<td>-.15**</td>
<td>-.00</td>
<td>-.00</td>
<td>-.08</td>
</tr>
<tr>
<td>Avoidance</td>
<td>-.05</td>
<td>-.04</td>
<td>.10†</td>
<td>.13*</td>
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<tr>
<td>Self-Punishment</td>
<td>.13*</td>
<td>.01</td>
<td>.06</td>
<td>.11†</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Sample 2</th>
<th>Gender</th>
<th>Affect</th>
<th>Motivation</th>
<th>Affect x Motivation</th>
</tr>
</thead>
<tbody>
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<td>Self-help</td>
<td>-.17*</td>
<td>-.07</td>
<td>.00</td>
<td>-.03</td>
</tr>
<tr>
<td>Approach</td>
<td>-.14*</td>
<td>.06</td>
<td>.12†</td>
<td>-.04</td>
</tr>
<tr>
<td>Accommodation</td>
<td>-.08</td>
<td>.11</td>
<td>.14*</td>
<td>.12†</td>
</tr>
<tr>
<td>Avoidance</td>
<td>-.08</td>
<td>-.02</td>
<td>.03</td>
<td>.04</td>
</tr>
<tr>
<td>Self-Punishment</td>
<td>-.06</td>
<td>-.10</td>
<td>.13†</td>
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</table>

<table>
<thead>
<tr>
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<th>Motivation</th>
<th>Affect x Motivation</th>
</tr>
</thead>
<tbody>
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<td>.04</td>
<td>-.16*</td>
<td>.02</td>
</tr>
<tr>
<td>Approach</td>
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<td>.09</td>
<td>-.03</td>
<td>-.06</td>
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<tr>
<td>Accommodation</td>
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<td>.05</td>
<td>-.01</td>
<td>.02</td>
</tr>
<tr>
<td>Avoidance</td>
<td>-.08</td>
<td>-.07</td>
<td>.16*</td>
<td>.04</td>
</tr>
<tr>
<td>Self-Punishment</td>
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<td>-.07</td>
<td>-.00</td>
<td>.05</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>All samples combined</th>
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<th>Motivation</th>
<th>Affect x Motivation</th>
</tr>
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<td>-.02</td>
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<td>-.04</td>
</tr>
<tr>
<td>Approach</td>
<td>-.11*</td>
<td>.05</td>
<td>.06</td>
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<td>Accommodation</td>
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<td>.01</td>
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<tr>
<td>Avoidance</td>
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<td>-.04</td>
<td>.09*</td>
<td>.07†</td>
</tr>
<tr>
<td>Self-Punishment</td>
<td>.02</td>
<td>-.05</td>
<td>.07†</td>
<td>.06</td>
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</tbody>
</table>

Note. Each of the table’s values represents the partial correlation between the predictors and the dependent variable controlling for all other variables included at that step.

†  $p < .10$
*  $p < .05$
** $p < .01$
*** $p < .001$
Table 9. Predicting Sample 1 competence- and relatedness-focused events from Gender, PA, Motivation, and PA x Motivation

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
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<tr>
<td><strong>Intrinsic Motivation Analyses</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
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<tr>
<td>Competence-focused</td>
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<tr>
<td>Relatedness-focused</td>
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<td>-.05</td>
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<tr>
<td><strong>External Regulation Analyses</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>Competence-focused</td>
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<tr>
<td>Relatedness-focused</td>
<td>-.05</td>
<td>.15**</td>
<td>.04</td>
<td>-.05</td>
</tr>
</tbody>
</table>

Note. Each of the table’s values represents the partial correlation between the predictors and the dependent variable controlling for all other variables included at that step.

†  $p < .10$
*  $p < .05$
** $p < .01$
*** $p < .001$

<sup>1</sup> Intrinsic motivation was used as the predictor.
<sup>2</sup> External regulation was used as the predictor.
Table 10. Meta-analysis of Pilot Study 1 and Sample 1 predicting competence- and relatedness-focused events from Gender, PA, Motivation, and PA x Motivation

<table>
<thead>
<tr>
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<th>Gender</th>
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<td>.10*</td>
<td>-.06</td>
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<tr>
<td>External Regulation Analyses(^2)</td>
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<tr>
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<td>Relatedness-focused</td>
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<td>.11*</td>
<td>-.04</td>
<td>-.02</td>
</tr>
</tbody>
</table>

Note. Each of the table’s values represents the partial correlation between the predictors and the dependent variable controlling for all other variables included at that step.

\(\dagger\) \(p < .10\)
\(*\) \(p < .05\)
\(**\) \(p < .01\)
\(***\) \(p < .001\)

\(^1\) Intrinsic motivation/autonomy orientation was used as the predictor.

\(^2\) External regulation/control orientation was used as the predictor.
Table 11. Study 2a: Correlations Among Dependent Variables and Manipulation Checks

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<tr>
<td>6. NA</td>
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<td>7. Vitality</td>
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<td>.65***</td>
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<td>.43***</td>
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<td>9. Control</td>
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<td>.11</td>
<td>.01</td>
<td>.30**</td>
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*  $p < .05$
** $p < .01$
*** $p < .001$
**Table 12.** Study 2a: Means for Manipulation Checks and Dependent Variables by Experimental Condition

<table>
<thead>
<tr>
<th></th>
<th>Autonomous PA</th>
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<td>Vitality</td>
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<td>1. Perseverance</td>
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<tr>
<td>2. Performance</td>
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<td>3. Creativity</td>
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<td>4. Altruism</td>
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<td>-.04</td>
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<td>7. Vitality</td>
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<td>8. Autonomy</td>
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<td>-.01</td>
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<td>9. Control</td>
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<td>.04</td>
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* p < .05
** p < .01
*** p < .001
### Table 14. Study 2b: Means for Manipulation Checks and Dependent Variables by Experimental Condition

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<td><strong>Manipulation Checks</strong></td>
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<td><strong>Dependent Variables</strong></td>
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<tr>
<td>Log Perseverance</td>
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### Table 15. Study 2b: Omnibus $F$ and Contrasts for the Condition Effects on Manipulation Checks and Dependent Variables

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<td>Dependent Variables</td>
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<td>Altruism$^3$</td>
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<td>.17</td>
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† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

$^1$ df for error associated with these analyses were 81
$^2$ df for error associated with these analyses were 61
$^3$ df for error associated with these analyses were 72
Figure 1. Effect of Time 1 positive affect and autonomy orientation on Time 2 total competence-focused events. High and low autonomy represent 1 SD below and 1 SD above the mean on autonomy orientation, respectively. The range of positive affect is from the -1 SD to +1 SD.
Figure 2. Effect of Time 1 positive affect and autonomy orientation on Time 2 loneliness. High and low autonomy represent 1 SD below and 1 SD above the mean on autonomy orientation, respectively. The range of positive affect is from the -1 SD to +1 SD.
Figure 3. Effect of Time 1 positive affect and self-determination on Time 2 Psychological Well-Being (eudaimonia). High and low self-determination represent 1 SD below and 1 SD above the mean on self-determination, respectively. The range of positive affect is from the -1 SD to +1 SD.
Figure 4. Effect of Time 1 positive affect and self-determination on a) Time 2 inspiration and b) mean daily creativity. High and low self-determination represent 1 SD below and 1 SD above the mean on self-determination, respectively. The range of positive affect is from the -1 SD to +1 SD.
Figure 5. Sample 2 effect of Time 1 positive affect and intrinsic motivation on Time 2 Self-Help. High and low intrinsic motivation represent 1 SD below and 1 SD above the mean on intrinsic motivation, respectively. The range of positive affect is from the -1 SD to +1 SD.
Figure 6. Sample 2 effect of Time 1 positive affect and intrinsic motivation on Time 2 Approach. High and low intrinsic motivation represent 1 SD below and 1 SD above the mean on intrinsic motivation, respectively. The range of positive affect is from the -1 SD to +1 SD.
Figure 7. Sample 2 effect of Time 1 positive affect and intrinsic motivation on Time 2 Self-Punishment. High and low intrinsic motivation represent 1 SD below and 1 SD above the mean on intrinsic motivation, respectively. The range of positive affect is from the -1 SD to +1 SD.
Figure 8. Sample 1 effect of Time 1 positive affect and external regulation on Time 2 Avoidance. High and low external represent 1 SD below and 1 SD above the mean on external regulation, respectively. The range of positive affect is from the -1 SD to +1 SD.
Figure 9. Sample 1 effect of Time 1 positive affect and external regulation on Time 2 Self-Punishment. High and low external represent 1 SD below and 1 SD above the mean external regulation, respectively. The range of positive affect is from the -1 SD to +1 SD.
Figure 10. Sample 2 effect of Time 1 positive affect and external regulation on Time 2 Accomodation. High and low external represent 1 SD below and 1 SD above the mean on external regulation, respectively. The range of positive affect is from the -1 SD to +1 SD.
Appendix A: Measures included in Pilot Study 1

* indicates a reverse-scored item

**Mood Scale**

**Positive Affect**
Pleased
Joyful
Full of Life
Happy
Satisfied

**Negative Affect**
Worried
Unhappy
Frustrated
Angry
Hopeless

**The General Causality Orientations Scale (17-item)**

1. **You have been offered a new position in a company where you have worked for some time. The first question that is likely to come to mind is:**
   a) What if I can’t live up to the new responsibility? (Impersonal)
   b) Will I make more at this position? (Control)
   c) I wonder if the new work will be interesting. (Autonomy)

2. **You had a job interview several weeks ago. In the mail you received a form letter which states that the position has been filled. It is likely that you might think:**
   a) It’s not what you know, but who you know. (Control)
   b) I’m probably not good enough for the job. (Impersonal)
   c) Somehow they didn’t see my qualifications as matching their needs. (Autonomy)

3. **You are a plant supervisor and have been charged with the task of allotting coffee breaks to three workers who cannot all break at once. You would likely handle this by:**
   a) Telling the three workers the situation and having them work with you on the schedule. (Autonomy)
   b) Simply assigning times that each can break to avoid any problems. (Control)
   c) Find out from someone in authority what to do or do what was done in the past. (Impersonal)
4. You have just received the results of a test you took, and you discovered that you did very poorly. Your initial reaction is likely to be:
   a) “I can’t do anything right,” and feel sad. (Impersonal)
   b) “I wonder how it is I did so poorly,” and feel disappointed. (Autonomy)
   c) “That stupid test doesn’t show anything,” and feel angry. (Control)

5. When you and your friend are making plans for Saturday evening, it is likely that you would:
   a) Leave it up to your friend; he (she) probably wouldn’t want to do what you’d suggest. (Impersonal)
   b) Each make suggestions and then decide together on something that you both feel like doing. (Autonomy)
   c) Talk your friend into doing what you want to do. (Control)

6. You have been invited to a large party where you know very few people. As you look forward to the evening, you would likely expect that:
   a) You’ll try to fit in with whatever is happening in order to have a good time and not look bad. (Control)
   b) You’ll find some people with whom you can relate. (Autonomy)
   c) You’ll probably feel somewhat isolated and unnoticed. (Control)

7. You are asked to plan a picnic for yourself and your fellow employees. Your style for approaching this project could most likely be characterized as:
   a) Take charge: that is, you would make most of the major decisions yourself. (Control)
   b) Follow precedent: you’re not really up to the task so you’d do it the way it’s been done before. (Impersonal)
   c) Seek participation: get inputs from others who want to make them before you make the final plans. (Autonomy)

8. Recently a position opened up at your place of work that could have meant a promotion for you. However, a person you work with was offered the job rather than you. In evaluating the situation, you’re likely to think:
   a) You didn’t really expect the job; you frequently get passed over. (Impersonal)
   b) The other person probably “did the right things” politically to get the job. (Control)
   c) You would probably take a look at factors in your own performance that led you to be passed over. (Autonomy)

9. You are embarking on a new career. The most important consideration is likely to be:
   a) Whether you can do the work without getting in over your head. (Impersonal)
   b) How interested you are in that kind of work. (Autonomy)
   c) Whether there are good possibilities for advancement. (Control)
10. A woman who works for you has generally done an adequate job. However, for the past two weeks her work has not been up to par and she appears to be less actively interested in her work. Your reaction is likely to be:
   a) Tell her that her work is below what is expected and that she should start working harder. (Control)
   b) Ask her about the problem and let her know you are available to help work it out. (Autonomy)
   c) It’s hard to know what to do to get her straightened out. (Impersonal)

11. Your company has promoted you to a position in a city far from your present location. As you think about the move you would probably:
   a) Feel interested in the new challenge and a little nervous at the same time. (Autonomy)
   b) Feel excited about the higher status and salary that is involved. (Control)
   c) Feel stressed and anxious about the upcoming changes. (Impersonal)

12. Within your circle of friends, the one with whom you choose to spend the most time is:
   a) The one with whom you spend the most time exchanging ideas and feelings. (Autonomy)
   b) The one who is the most popular of them. (Control)
   c) The one who needs you the most as a friend. (Impersonal)

13. You have a school-age daughter. On parents’ night the teacher tells you that your daughter is doing poorly and doesn’t seem involved in the work. You are likely to:
   a) Talk it over with your daughter to understand further what the problem is. (Autonomy)
   b) Scold her and hope she does better. (Impersonal)
   c) Make sure she does the assignments, because she should be working harder. (Control)

14. Your friend has a habit that annoys you to the point of making you angry. It is likely that you would:
   a) Point it out each time you notice it, that way maybe he(she) will stop doing it. (Control)
   b) Try to ignore the habit because talking about it won’t do any good anyway. (Impersonal)
   c) Try to understand why your partner does it and why it is so upsetting for you. (Autonomy)

15. A close (same-sex) friend of yours has been moody lately, and a couple of times has become very angry with you over “nothing.” You might:
   a) Share your observations with him/her and try to find out what is going on for him/her. (Autonomy)
b) Ignore it because there’s not much you can do about it anyway. (Impersonal)
c) Tell him/her that you’re willing to spend time together if and only if he/she makes more effort to control him/herself. (Control)

16. Your friend’s younger sister is a freshman in college. Your friend tells you that she has been doing badly and asks you what he (she) should do about it. You advise him (her) to:
a) Talk it over with her and try to see what is going on for her. (Autonomy)
b) Not mention it; there’s nothing he (she) could do about it anyway. (Impersonal)
c) Tell her it’s important for her to do well, so she should be working harder. (Control)

17. You feel that your friend is being inconsiderate. You would probably:
a) Find an opportunity to explain why it bothers you; he (she) may not even realize how much it is bothering you. (Autonomy)
b) Say nothing; if your friend really cares about you he (she) would understand how you feel. (Impersonal)
c) Demand that your friend start being more considerate; otherwise you’ll respond in kind. (Control)

MSEI

Items assessed on truth
I am usually able to demonstrate my competence when I am being evaluated.
Most people who know me consider me to be a highly talented and competent person.
There are no areas in which I have truly outstanding ability. *
I am usually able to learn new things very quickly.

Items assessed on frequency
How often do you expect to perform well in situations that require a lot of ability?
How often do you have trouble learning difficult new tasks? *
How often do you feel that you can do well at almost anything you try?
Have you ever felt that you lack the intelligence needed to succeed in certain types of interesting work? *
How often do you feel that you are not as intelligent as you would like to be? *
How often do you approach new tasks with a lot of confidence in your ability?

UCLA Loneliness

I feel in tune with the people around me. *
I lack companionship.
There is no one I can turn to.
I do not feel alone. *
I feel part of a group of friends. *
I have a lot in common with the people around me. *
I am no longer close to anyone.
My interests and ideas are not shared by those around me.
I am an outgoing person. *
There are people I feel close to. *
I feel left out.
My social relationships are superficial.
No one really knows me well.
I feel isolated from others.
I can find companionship when I want it. *
There are people who really understand me. *
I am unhappy being so withdrawn.
People are around me but not with me.
There are people I can talk to. *
There are people I can turn to. *

**Event Schedule**

**Positive competence-focused events**
Completed work on a school project or caught up in coursework.
Attended a stimulating/interesting class or lecture.
Received praise on my schoolwork.
Did well on a test or other school assignment.

**Negative competence-focused events**
Did poorly on a test or other school assignment.
Fell behind in coursework.
Was criticized on my schoolwork.
Attended a particularly unpleasant or boring class/lecture.
Had a hard time understanding or felt overwhelmed by difficult class material.

**Positive relatedness-focused events**
Had especially good interaction with friend(s) or acquaintances.
Enjoyed going out with friends or casual date (to party, club, etc.).
Did something special for a boyfriend/girlfriend.
Flirted with someone or arranged a date.
Enjoyed getting together with a boyfriend/girlfriend.
Sent or received and enjoyable letter/e-mail/phone call from a friend, boyfriend/girlfriend, or family member.

**Negative relatedness-focused events**
Something happened that made me feel awkward or embarrassed in public.
Others acted disinterested in something I said or did.
Had disagreement with a friend, boyfriend/girlfriend, or family member.
Had an unpleasant interaction with someone other than a friend, boyfriend/girlfriend, or family member.
Friends were not available when I wanted to socialize.
Had plans fall through to spend time someone special.
Negative financial-focused events
Had money problems.
Had financial conflict with family members.
Appendix B: Items included in Pilot Study 2

* indicates a reverse-scored item

**Mood Scale**

**Positive Affect**
- Pleased
- Joyful
- Full of Life
- Happy
- Satisfied

**Negative Affect**
- Worried
- Unhappy
- Frustrated
- Angry
- Hopeless

**Self-Determination Scale**

**Choice Items (all reverse-scored)**
A. I always feel like I choose the things I do.
B. I sometimes feel that it’s not really me choosing the things I do.

A. I choose to do what I have to do.
B. I do what I have to, but I don’t feel like it is really my choice.

A. I do what I do because it interests me.
B. I do what I do because I have to.

A. I am free to do whatever I decide to do.
B. What I do is often not what I’d choose to do.

A. I feel pretty free to do whatever I choose to.
B. I often do things that I don't choose to do.

**Awareness Items**
A. My emotions sometimes seem alien to me.
B. My emotions always seem to belong to me.

A. I feel that I am rarely myself.
B. I feel like I am always completely myself.

A. When I accomplish something, I often feel it wasn't really me who did it.
B. When I accomplish something, I always feel it's me who did it.

A. My body sometimes feels like a stranger to me.
B. My body always feels like me.

A. Sometimes I look into the mirror and see a stranger.
B. When I look into the mirror I see myself.

Ryff’s Eudaimonia Scale

**Autonomy**
I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.
My decisions are not usually influenced by what everyone else is doing.
I tend to worry about what other people think of me. *
Being happy with myself is more important to me than having others approve of me.
I tend to be influenced by people with strong opinions. *
I have confidence in my opinions, even if they are contrary to the general consensus.
It's difficult for me to voice my own opinions on controversial matters. *
I often change my mind about decisions if my friends or family disagree. *
I judge myself by what I think is important, not by the values of what others think is important.

**Environmental Mastery**
In general, I feel I am in charge of the situation in which I live.
The demands of everyday life often get me down. *
I do not fit very well with the people and the community around me. *
I am quite good at managing the many responsibilities of my daily life.
I often feel overwhelmed by my responsibilities. *
I generally do a good job of taking care of my personal finances and affairs.
I am good at juggling my time so that I can fit everything in that needs to get done.
I have difficulty arranging my life in a way that is satisfying to me. *
I have been able to build a home and a lifestyle for myself that is much to my liking.

**Personal Growth**
I am not interested in activities that will expand my horizons. *
I don't want to try new ways of doing things--my life is fine the way it is. *
I think it is important to have new experiences that challenge how you think about yourself and the world.
When I think about it, I haven't really improved much as a person over the years. *
I have the sense that I have developed a lot as a person over time.
I do not enjoy being in new situations that require me to change my old familiar ways of doing things. *
For me, life has been a continuous process of learning, changing, and growth.
I gave up trying to make big improvements or changes in my life a long time ago. *
There is truth to the saying you can't teach an old dog new tricks. *

Positive relations with others
Most people see me as loving and affectionate.
Maintaining close relationships has been difficult and frustrating for me *
I often feel lonely because I have few close friends with whom to share my concerns. *
I enjoy personal and mutual conversations with family members or friends.
I don't have many people who want to listen when I need to talk. *
It seems to me that most other people have more friends than I do. *
People would describe me as a giving person, willing to share my time with others.
I have not experienced many warm and trusting relationships with others. *
I know that I can trust my friends, and they know they can trust me.

Purpose in life
I live life one day at a time and don't really think about the future. *
I tend to focus on the present, because the future nearly always brings me problems. *
My daily activities often seem trivial and unimportant to me. *
I don't have a good sense of what it is I'm trying to accomplish in life. *
I used to set goals for myself, but that now seems like a waste of time. *
I enjoy making plans for the future and working to make them a reality.
I am an active person in carrying out the plans I set for myself.
Some people wander aimlessly through life, but I am not one of them.
I sometimes feel as if I've done all there is to do in life. *

Self-accepatance
When I look at the story of my life, I am pleased with how things have turned out.
In general, I feel confident and positive about myself.
I feel like many of the people I know have gotten more out of life than I have. *
I like most aspects of my personality.
I made some mistakes in the past, but I feel that all in all everything has worked out for the best.
In many ways, I feel disappointed about my achievements in life. *
My attitude about myself is probably not as positive as most people feel about themselves. *
The past had its ups and downs, but in general, I wouldn't want to change it.
When I compare myself to friends and acquaintances, it makes me feel good about who I am.

Inspiration Scale
I experience inspiration.
   How often does this happen?
   How deeply or strongly (in general)?

Something I encounter or experience inspires me.
   How often does this happen?
   How deeply or strongly (in general)?
I am inspired to do something
   How often does this happen?
   How deeply or strongly (in general)?

I feel inspired
   How often does this happen?
   How deeply or strongly (in general)?
Appendix C: Measures included in Study 1

* indicates a reverse-scored item

**PANAS**

**Positive Affect**
interested
excited
strong
enthusiastic
proud
alert
inspired
determined
attentive
active

**Negative Affect**
distressed
upset
guilty
scared
hostile
irritable
ashamed
nervous
jittery
afraid

**Academic Motivation Scale**

**Intrinsic Motivation to know**
Because I experience pleasure and satisfaction while learning new things.
For the pleasure I experience when I discover new things never seen before.
For the pleasure that I experience in broadening my knowledge about subjects which appeal to me.
Because my studies allow me to continue to learn about many things that interest me.

**Intrinsic Motivation toward accomplishment**
For the pleasure I experience while surpassing myself in my studies.
For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments.
For the satisfaction I feel when I am in the process of accomplishing difficult academic activities.
Because college allows me to experience a personal satisfaction in my quest for excellence in my studies.
Intrinsic Motivation to experience stimulation
For the intense feelings I experience when I am communicating my own ideas to others.
For the pleasure that I experience when I read interesting authors.
For the pleasure that I experience when I feel completely absorbed by what certain authors have written.
For the "high" feeling that I experience while reading about various interesting subjects.

External Regulation
Because with only a high-school degree I would not find a high-paying job later on.
In order to obtain a more prestigious job later on.
Because I want to have "the good life" later on.
In order to have a better salary later on.

GCOS (12-item)

1. You have been offered a new position in a company where you have worked for some time. The first question that is likely to come to mind is:
   a) What if I can't live up to the new responsibility? (Impersonal)
   b) Will I make more at this position? (Control)
   c) I wonder if the new work will be interesting. (Autonomy)

2. You have a school-age daughter. On parents' night the teacher tells you that your daughter is doing poorly and doesn't seem involved in the work. You are likely to:
   a) Talk it over with your daughter to understand further what the problem is. (Autonomy)
   b) Scold her and hope she does better. (Impersonal)
   c) Make sure she does the assignments, because she should be working harder. (Control)

3. You had a job interview several weeks ago. In the mail you received a form letter which states that the position has been filled. It is likely that you might think:
   a) It's not what you know, but who you know. (Control)
   b) I'm probably not good enough for the job. (Impersonal)
   c) Somehow they didn't see my qualifications as matching their needs. (Autonomy)
4. You are a plant supervisor and have been charged with the task of allotting coffee breaks to three workers who cannot all break at once. You would likely handle this by:

   a) Telling the three workers the situation and having them work with you on the schedule. (Autonomy)
   b) Simply assigning times that each can break to avoid any problems. (Control)
   c) Find out from someone in authority what to do or do what was done in the past. (Impersonal)

5. A close (same-sex) friend of yours has been moody lately, and a couple of times has become very angry with you over "nothing." You might:

   a) Share your observations with him/her and try to find out what is going on for him/her. (Autonomy)
   b) Ignore it because there's not much you can do about it anyway. (Impersonal)
   c) Tell him/her that you're willing to spend time together if and only if he/she makes more effort to control him/herself. (Control)

6. You have just received the results of a test you took, and you discovered that you did very poorly. Your initial reaction is likely to be:

   a) "I can't do anything right," and feel sad. (Impersonal)
   b) "I wonder how it is I did so poorly," and feel disappointed. (Autonomy)
   c) "That stupid test doesn't show anything," and feel angry. (Control)

7. You have been invited to a large party where you know very few people. As you look forward to the evening, you would likely expect that:

   a) You'll try to fit in with whatever is happening in order to have a good time and not look bad. (Control)
   b) You'll find some people with whom you can relate. (Autonomy)
   c) You'll probably feel somewhat isolated and unnoticed. (Impersonal)

8. You are asked to plan a picnic for yourself and your fellow employees. Your style for approaching this project could most likely be characterized as:

   a) Take charge: that is, you would make most of the major decisions yourself. (Control)
   b) Follow precedent: you're not really up to the task so you'd do it the way it's been done before. (Impersonal)
   c) Seek participation: get inputs from others who want to make them before you make the final plans. (Autonomy)
9. Recently a position opened up at your place of work that could have meant a promotion for you. However, a person you work with was offered the job rather than you. In evaluating the situation, you're likely to think:

a) You didn't really expect the job; you frequently get passed over. (Impersonal)
b) The other person probably "did the right things" politically to get the job. (Control)
c) You would probably take a look at factors in your own performance that led you to be passed over. (Autonomy)

10. You are embarking on a new career. The most important consideration is likely to be:

a) Whether you can do the work without getting in over your head. (Impersonal)
b) How interested you are in that kind of work. (Autonomy)
c) Whether there are good possibilities for advancement. (Control)

11. A woman who works for you has generally done an adequate job. However, for the past two weeks her work has not been up to par and she appears to be less actively interested in her work. Your reaction is likely to be:

a) Tell her that her work is below what is expected and that she should start working harder. (Control)
b) Ask her about the problem and let her know you are available to help work it out. (Autonomy)
c) It's hard to know what to do to get her straightened out. (Impersonal)

12. Your company has promoted you to a position in a city far from your present location. As you think about the move you would probably:

a) Feel interested in the new challenge and a little nervous at the same time. (Autonomy)
b) Feel excited about the higher status and salary that is involved. (Control)
c) Feel stressed and anxious about the upcoming changes. (Impersonal)

Extended COPE

Active coping
I concentrated my efforts on doing something about it
I took additional action to try to get rid of the problem
I took direct action to get around the problem
I did what had to be done, one step at a time
Planning
I made a plan of action
I tried to come up with a strategy about what to do
I thought about how I might best handle the problem
I thought hard about what steps to take

Suppression of competing activities
I kept myself from getting distracted by other thoughts
I focused on dealing with this problem, and if necessary let other things slide a little
I tried hard to prevent other things from interfering with my efforts at dealing with it
I put aside other activities in order to concentrate on the problem

Restraint coping
I restrained myself from doing anything too quickly
I held off doing anything about it until the situation permitted
I made sure not to make matters worse by acting too soon
I forced myself to wait for the right time to do something

Seeking social support—instrumental
I tried to get advice from someone about what to do
I talked to someone to find out more about the situation
I talked to someone who could do something concrete about the problem
I asked people who had had similar experiences what they did

Seeking social support—emotional
I discussed my feelings with someone
I tried to get emotional support from friends or relatives
I got sympathy and understanding from someone
I talked to someone about how I felt

Positive reinterpretation & growth
I tried to grow as a person as a result of the experience
I tried to see it in a different light, to make it seem more positive
I looked for something good in what was happening
I learned something from the experience

Acceptance
I got used to the idea that it happened
I accepted that it had happened and that it couldn't be changed
I accepted the reality of the fact that it had happened
I learned to live with it

Denial
I said to myself "this isn't real."
I refused to believe that it had happened
I pretended that it hadn't really happened
I acted as though it hadn't even happened

**Behavioral disengagement**
I admitted to myself that I couldn't deal with it, and quit trying
I just gave up trying to reach my goal
I gave up the attempt to get what I wanted
I reduced the amount of effort I put into solving the problem

**Mental disengagement (original)**
I turned to work or other substitute activities to take my mind off things
I daydreamed about other things
I slept more than usual
I went to movies or watched TV to think about it less

**Self-blame**
I blamed myself
I realized I brought the problem on myself
I criticized or lectured myself
I saw that I was at the root of the problem

**Self-focused rumination**
I just thought about my problem constantly
I returned in my head again and again to what was troubling me
I relived the problem by dwelling on it all the time
I brooded over my problem nonstop

**Expressing emotion**
I took time to express my emotions
I let my emotions show
I tried to let out my feelings
I allowed myself to show how I felt about things

**Understanding emotion**
I worked on understanding my feelings
I tried to make sense of my emotions
I attempted to clear up any confusion I had about my feelings
I clarified to myself how I felt

**Maintaining optimism**
I tried to be optimistic in spite of what happened
I worked on feeling positive no matter what
I refused to let negative emotions drag me down
I worked on staying positive even when things looked bad
**Goal replacement**
I sought another goal, something else to strive for
I tried to identify something else I cared about
I tried to find a substitute—a new goal
I sought a replacement—something else I cared to obtain

**Other-blame**
I blamed someone or something for what happened to me
I got angry at someone I held responsible for what happened
I accused someone of causing my misfortune
I found out who brought the problem on me

**Mental disengagement (revised)**
I tried not to think about it
I distracted myself by thinking about other things
I tried to forget the whole thing
I did other things to take my mind off it

**R-COPE**

**Self-help**
I took time to express my emotions
I talked to someone to find out more about the situation
I let my emotions show
I discussed my feelings with someone
I tried to get emotional support from friends or relatives
I talked to someone about how I felt
I tried to let out my feelings
I allowed myself to show how I felt about things

**Approach**
I tried to come up with a strategy about what to do
I took additional action to try to get rid of the problem
I made a plan of action
I concentrated my efforts on doing something about it
I tried hard to prevent other things from interfering with my efforts at dealing with it
I took direct action to get around the problem
I thought hard about what steps to take
I did what had to be done, one step at a time

**Accomodation**
I tried to be optimistic in spite of what happened
I got used to the idea that it happened
I worked on feeling positive no matter what
I tried to identify something else I cared about
I tried to see it in a different light, to make it seem more positive
I looked for something good in what was happening
I worked on staying positive even when things looked bad
I accepted the reality of the fact that it had happened

**Avoidance**
I refused to believe that it had happened
I blamed someone or something for what happened to me
I admitted to myself that I couldn't deal with it, and quit trying
I said to myself "this isn't real."
I pretended that it hadn't really happened
I accused someone of causing my misfortune
I tried to forget the whole thing
I gave up the attempt to get what I wanted

**Self-punishment**
I returned in my head again and again to what was troubling me
I just thought about my problem constantly
I blamed myself
I criticized or lectured myself
I relived the problem by dwelling on it all the time
I realized I brought the problem on myself
I saw that I was at the root of the problem
I brooded over my problem nonstop

**Event Questionnaire**

Skipped your most important class more than three times
Lost more than 10 pounds.
Gained more than 10 pounds.
Visited New York City once or more.
Exercised at least twice a week.
Had an out-of-town friend visit you.
Was seriously ill one day because of overdrinking
Participated in a psychology experiment (besides this one)
Experienced a significant attack of insomnia.
Questioned your decision to attend the University of Rochester
Changed roommates.
Visited a friend more than 100 miles away
Threw a party for more than 20 people.
Began a major relationship
Had a serious disagreement with a good friend.
Bounced a check
Argued with one of your professors or TAs over a grade.
Spent Thanksgiving at home.
Was the victim of a crime
Got a parking or speeding ticket.
Studied later than 4 a.m. on at least one occasion.
Ended a major relationship.
Obtained an average of B+ or better in the midterm exams.
Wrote your best friend more than once a month.
Declared or change your major.
Saw a counselor because of academic or social problems.
Met a person who became a good friend.
Dropped a course after the fifth week.
Participated in intramural sports.
Felt seriously homesick.
Missed more than 2 days of classes because of sickness.
Took part in an organized protest.
Changed a class to pass/fail grade.
Had an academic "slump" for more than 2 weeks.
Appendix D: Predicting coping from Gender, PA, Intrinsic Motivation/Autonomy, and PA x Intrinsic Motivation/Autonomy

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All Samples Combined

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Note. Each of the table’s values represents the partial correlation between the predictors and the dependent variable controlling for all other variables included at that step.

$^+$ $p < .10$

$^*$ $p < .05$

$^{**}$ $p < .01$

$^{***}$ $p < .001$

$^1$ These values are based only on Samples 1 and 3.
### Appendix E: Predicting coping from Gender, PA, External Regulation/Control, and PA x External Regulation/Control

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### Sample 2

| Reframing | -.07   | .04    | .15*       | .14*        |
| Active Coping | -.16*  | .08    | .10        | -.07        |
| Planning | -.13*  | .12†   | .09        | -.01        |
| Emotional SS | -.15*  | -.05   | .012       | -.02        |
| Instrumental SS | -.09   | .06    | -.08       | .07         |
| Suppression of competing activities | .06    | -.12†  | .12†       | .00         |
| Acceptance | -.13†  | .07    | .02        | .17*        |
| Behavioral Disengagement | -.02   | -.07   | .06        | -.04        |
| Denial | -.11   | -.05   | .01        | .11         |
| Restraint Coping | -.02   | -.05   | -.05       | -.03        |
| Self-Blame | -.04   | -.11†  | .15*       | -.01        |
| Ruminiation | -.07   | -.08   | .05        | .04         |
| Expressing Emotion | -.15*  | -.07   | .04        | -.06        |
| Understanding Emotion | -.16*  | .06    | .03        | .02         |
| Maintaining Optimism | -.05   | .13†   | .13†       | .11         |
| Mental Disengagement | .04    | .05    | .07        | -.04        |

### Sample 3

<p>| Reframing | -.05   | .11    | -.06       | -.07        |
| Active Coping | -.02   | .10    | -.06       | -.06        |</p>
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All Samples Combined

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Note. Each of the table’s values represents the partial correlation between the predictors and the dependent variable controlling for all other variables included at that step.

† p < .10
* p < .05
** p < .01
*** p < .001

1 These values are based only on Samples 1 and 3.
Appendix F: Affect and Motivational State Manipulation in Study 2a

AUTONOMOUS PA CONDITION
Imagine that you are enrolled in a class that is not required for your major but which you have always wanted to attend. The subject has always intrigued you, but you have never had a chance to investigate it. Although the course is not required, you find the material challenging and want to understand it. You realized when you signed up for the course that the material would be entirely new to you, and so it could be interesting but difficult. Still you want to give it a try. In short, you are taking this course only because you are interested in learning and you find the topic intriguing.

Now, imagine that although the course was difficult, you scored 47 of 50 on the final exam. You take this as evidence that you have mastered the materials. Imagine everything that is involved with that situation: successfully meeting the challenge, grasping complex concepts, getting a handle on the material, and feeling that you got it. You are almost in awe of your ability to make something a part of you when it is interesting. You feel like you are the master of yourself. Please close your eyes and make the scene as real and vivid as possible. When you have the scene in your head, please write about it focusing on the way you feel about the situation rather than on the concrete details of the scene. You will have 10 minutes.

CONTROLLED PA CONDITION
Imagine that you have enrolled in a class that is required for your major but which you don’t want to attend. The subject does not interest you and you see no use for the material being taught. However, because the course is required for your major, you must do well at it. You realized when you signed up for the course that the material would be entirely new to you, and so it could be rather boring and difficult. In short, you are taking this course only because you have to and you feel a lot of pressure to do well.

Now, imagine that although the course was difficult and you were not interested in the information, you scored 47 of 50 on the final exam, doing better than most of your classmates. Imagine everything that is involved with that situation: forcing yourself to study difficult and boring materials to do well on something you don’t like, and getting a much higher grade than other students. You are almost in awe at your ability to put others to shame when grades are concerned. You feel like you are the master of the world. Please close your eyes and make the scene as real and vivid as possible. When you have the scene in your head, please write about it focusing on the way you feel about the situation rather than on the concrete details of the scene. You will have 10 minutes.

NEUTRAL AFFECT CONDITION
Imagine that you are enrolled in a typical college class that is part of your major. This class is not particularly interesting, but it is certainly not boring either. You have to work somewhat hard, but it’s definitely not the most difficult class you are taking. You have a few friends in the class, but due to the lecture style of the class, you do not have much
opportunity to socialize. The professor seems to be knowledgeable about the subject matter. In short, you are taking this class to fulfill a requirement but you don’t mind being there.

Imagine that you have showed up to take part in a typical day in this class. The professor is up front lecturing, and you are sitting in the middle of the room reading the overhead and taking notes. The topic being discussed today is going to be covered on the next exam, but that’s still a couple weeks off. Please close your eyes and make the scene as real and vivid as possible. When you have the scene in your head, please write about it focusing on the way you feel about the situation rather than on the concrete details of the scene. You will have 10 minutes.
Appendix G: Manipulation Checks from Studies 2a and 2b

**PANAS**

**Positive Affect**
interested
excited
strong
enthusiastic
proud
alert
inspired
determined
attentive
active

**Negative Affect**
distressed
upset
guilty
scared
hostile
irritable
ashamed
nervous
jittery
afraid

**Vitality Scale**
I feel alive and vital.
I don't feel very energetic.
Sometimes I feel so alive I just want to burst.
I have energy and spirit.
I look forward to each new day.
I nearly always feel alert and awake.
I feel energized.
Appendix H: Affect and Motivational State Manipulation in Study 2b

AUTONOMOUS PA CONDITION

I feel confident about understanding what is important in life.
If you attitude is good, then a fulfilling life will follow, and my attitude is good.
In a buoyant mood like this one, I can work fast and really understand it.
I can really grow as a person in this mood.
I have a sense of vigor—being able to realize my potential.
I feel industrious as heck—I want something interesting to do!
I am optimistic that I can grow as a person.
My judgment is keen and precise today—I can get to the bottom of complicated stuff.
This might turn out to be one of my most interesting days.
I am glad—lots of interesting times are coming along.
If I set my mind to it, I can figure out what is important to me.
Life is to be explored—I will find its treasures.
My judgment about most things is sound—I found out through trial and error.
There should be opportunity to a lot of growth coming along.
On the whole, I have very little difficulty thinking originally.
If there are things that interest me, I can concentrate hard and do them.
I am getting there—I am really getting interested in my classes.
I am able to get good grades when the subject matter is interesting and challenging.
Life is like a wisdom box; it seems to offer so many sources of fulfillment.
Most of the things that have depressed me wouldn’t have if I’d just understood what I am really about.
I’ve certainly got energy and creativity to spare.
It’s encouraging that as I get farther into my major, the classes get so much more interesting.
I’m glad I’m in college—I find the environment stimulating.
This is one of those days when I can get really absorbed in my schoolwork and learn a lot.
I feel superb! I can work very well on the things that interest me.
I know good and well that I can achieve the goals that I set for myself.
I’m full of energy—I feel like I could really learn a lot.
I feel that my inner core—what I am about—will stick with me in the future.

CONTROLLED PA CONDITION

I am happy that I do extremely well in the classes that my parents say are important for me.
I am at the top of the world because my friends look up to me.
I’m optimistic that I can get a high paying job and become rich.
This might turn out to be the kind of day my parents would like me to have.
On the whole, I am very good at doing what others expect of me.
I feel that I successfully fulfill what others expect me to do.
If there are things that my parents want me to do, I can concentrate hard and do them.
I know good and well that I can achieve the goals that my parents and society set for me.
I do very well on the track my advisor told me to follow.
I feel superb! No one has the power over other people that I have.
I feel that my good looks—what people are most likely to judge me on—will stick with me in the future.
Things have really hit a high point for me—I have achieved many of the goals that my parents have given me.
This is one of those days when I can really please my parents.
In a buoyant mood like this one, I can get people to do what I tell them.
Most of the things that have depressed me wouldn't have if I'd just done what my parents told me to do.
If I set my mind to it, I know how to become one of the “rich and famous.”
I feel confident about becoming rich and powerful.
I have a sense of power—being able to go places so that people will look up to me.
There should be opportunity to make a lot of money coming along.
When I want to, I can make other people admire me.
My judgment about most things is sound—my parents told me so.
Life is like a cash box; I can get from it all the money, prestige, and power that I desire.
I know I am worthwhile because other people tell me so.
I feel like getting some attention by telling a funny joke.
I know I have what it takes to become rich someday.
I’m pleased that most people admire me.
I can do everything that my parents want me to do.
I am able to have influence on even the most intelligent people.

**NEUTRAL AFFECT CONDITION**

Many states supply milk for grammar school children.
Japan was elected to the United Nations almost fourteen years after Pearl Harbor.
We have two kinds of nouns denoting physical things: individual and mass nouns.
Agricultural products comprised seventy percent of the income.
Some streets were still said to be listed under their old names.
There is a large rose-growing center near Tyler, Texas.
The typography, paper, and bind were of the highest quality.
The desk was old, and scratched into its surface was a profusion of dates, initials, and pleading messages.
The Orient Express travels between Paris and Istanbul.
There isn't a scientific explanation for every U.F.O. sighting.
The review is concerned with the first three volumes.
Slang is a constantly changing part of the language.
There are some forms in which no oath is required.
99.1% of Alaska is owned by the federal government.
The wood was discolored as if it had been held in a fire.
Painting in a few other non-European countries is treated in a separate volume.
Provoked arousal and orientation are accompanied by steeper negative shifts.
A light was noticed in the dark outside, and it moved eerily towards the house.
Significantly, these changes occur during the full moon.
West Samoa gained its independence in 1965.
The map would prove useless as a beginning guide.
Black and white pictures are arranged in ten sections.
The papers had been front-paging it for days.
Potter wrote numerous satires on social cynicism.
The doorkeeper was dressed in red.
The organization depended on the people for support.
In was their sixth consecutive best seller.
The merger did not change the company's policy.