

Undergraduate Honors Program

Psychology

**Individual differences in Time Insensitivity: Examining
links to emotions and cognitive performance on time
pressure tasks**

by

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submitted in partial fulfillment of the requirements
the degree of

B.A.

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2004

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Abstract

The aim of the present study was to examine whether individual differences in Time Insensitivity are related to subjective experiences of emotion and cognitive performance. Sixty-five undergraduates (52% female) completed self-report measures of cognitive flexibility and provided subjective self-reports of emotions following two time pressured cognitive tasks. As predicted, Time Insensitivity was related to self-reported cognitive flexibility, better cognitive performance during a time pressured task, as well as less negative subjective experience in response to these tasks. The results of the present study suggest that Time Insensitivity may have some beneficial outcomes. Limitations and implications for future directions are discussed.

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May 2004

Abstract

The aim of the present study was to examine whether individual differences in Time Insensitivity are related to subjective experiences of emotion and cognitive performance. Sixty-five undergraduates (52% female) completed self-report measures of cognitive flexibility and provided subjective self-reports of emotions following two time pressured cognitive tasks. As predicted, Time Insensitivity was related to self-reported cognitive flexibility, better cognitive performance during a time pressured task, as well as less negative subjective experience in response to these tasks. The results of the present study suggest that Time Insensitivity may have some beneficial outcomes. Limitations and implications for future directions are discussed.

Individual Differences in Time Insensitivity:

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“In this world, there are two times. There is mechanical time and there is body time. The first is as rigid and metallic as a massive pendulum of iron that swings back and forth, back and forth, back and forth. The second squirms and wriggles like a bluefish in a bay. The first is unyielding, predetermined. The second makes up its mind as it goes along.” –Alan Lightman (1993)

The way in which people conceptualize time seems to be a crucial yet subtle aspect of everyday life. The feeling of being controlled or pressured by time influences the decisions we make, the actions we choose, and how we feel. Cultures vary greatly in their conceptualization of time. Some cultures highly value appointments, deadlines, punctuality, and effective time management skills. Other cultures seem to be characterized as being less aware of time, being unconcerned with punctuality, and rarely seem rushed or pressured by time (Levine & Bartlett, 1984; Levine, 1988; Levine, West, & Reis, 1980), suggesting an overall insensitivity to time constraints. The goal of this paper is to explore whether individual differences in Time Insensitivity are related to other aspects of psychological processes.

Time Insensitivity

Much theory has been generated by philosophers, anthropologists, and psychologists regarding difference in time perspective across cultures. Edward Hall coined the term *Micro time* to describe “the system of time that is congruent with and a product of primary level culture” (1983). Research suggests that people living in slow

paced cultures conceptualize time in a way that is more insensitive than individuals in fast paced societies.

Although many different terminologies and labels are used, the distinction has been made between what Hall describes as Monochronic (M-time) and Polychronic (P-time). M-time is characterized as experiencing and using time in a linear fashion, doing things one at a time, imposing compartmentalization and structure. This perspective treats time as a tangible object, and something that can be wasted, lost, or killed. “In a Monochronic system, the schedule may take priority above all else and be treated as sacred and unalterable” (Hall & Hall, 1990). For example, an individual characterized by a Monochronic orientation is likely to make lists of things to do, adhere strictly to a detailed schedule, check the time often, and be extremely concerned with punctuality.

Polychronic time, on the other hand, is characterized by the simultaneous occurrence of many things as they come. This perspective does not treat time as a tangible object, but instead places more emphasis on human interaction than keeping schedules. For example, two individuals with a Polychronic orientation who are deep in conversation would prefer to be late for an approaching appointment than terminate the conversation before its natural conclusion (Hall, 1983; Hall & Hall, 1990). Individuals characterized by a Polychronic time orientation are less concerned with planning the way in which time is spent, adhering to schedules, and being punctual.

Support for this distinction in the psychological meaning of time can be found by examining the literature conducted by psychologists on the pace of life in different cultures. These studies suggest that time and schedules are valued more in the Monochronic American and Northern European cultures than the Polychronic cultures of

the Mediterranean and Southern European countries. America and most Northern European cultures are considered to be fast-paced, while Mediterranean, South American, and developing countries are described as slow-paced cultures. One study found that slower paced cultures (Taiwan, Indonesia, and Italy) had less accurate clocks (Levine, 1984). People responded with greater deviation from the actual time when asked “Do you have the time”, and exhibited slower walking speeds when compared with the fast paced cultures of Japan, England, and the U.S. (Levine, 1984). Similarly, cultures vary in how punctuality is defined. When asked what they would consider early or late in various hypothetical situations, Brazilian students (members of a slow-paced culture) gave larger ranges than American students (members of a fast-paced culture) (Levine, West, & Reis, 1980).

Another way that time orientation has been conceptualized by psychologists is an individual’s preference towards focusing on the past, present, or future. It is described as the nonconscious process whereby experiences are assigned to one of these time frames, helping to give order and meaning to those events (Zimbardo & Boyd, 1999). A general future orientation is characterized by behavior that is dominated by striving for future goals and rewards, and is related to conscientiousness and preference for consistency, suggesting that individuals high in future time orientation prefer structure and order. Participants with high scores on the future orientation subfactor were more likely to report stress and the pressure to use time efficiently (Zimbardo & Boyd, 1999), mirroring the characteristics of low Time Insensitivity.

A Present-Hedonistic orientation reflects a hedonistic, risk-taking attitude toward time and life (Zimbardo & Boyd, 1999). It suggests an orientation towards present

pleasure with little concern for future consequences. This factor was positively related to ego undercontrol, novelty seeking, sensation seeking, and negatively related to preference for consistency. Those with high scores on the Present-Hedonistic factor are more likely to report not wearing a wristwatch, communicating with family more, and having less clearly defined future goals (Zimbardo & Boyd, 1999).

A Future orientation can be likened to low Time Insensitivity (Monochronic time perspective), while individuals scoring highly on the Present-Hedonistic subfactor can be described as Time Insensitive (Polychronic time perspective). As might be expected, there are cultural differences in these time orientations. Interestingly, compared with an American sample, young Italian participants (16 – 27 years old) reported being less future oriented (D'Alessio, Guarino, De Pascalis, & Zimbardo, 2003). The Monochronic nature of American culture trains individuals to be more aware of time schedules and structures, while the Polychronic Italian culture has the opposite effect, leading individuals to be less aware of schedules and more likely to enjoy the moment (Hall, 1983; Hall & Hall, 1990).

Taken together, this research suggests a link between culture and Time Insensitivity. While most of this literature compares cultures, it is likely that individuals also differ in Time Insensitivity within cultures. The purpose of the present research is to examine such differences.

Individual Differences in Time Insensitivity

Individuals characterized by Time Insensitivity do not feel strong pressure to adhere to schedules, use time efficiently, wear wristwatches, or check the time often. It seems that Time Insensitive individuals do not experience as much stress under time

constraints as individuals characterized by low Time Insensitivity. If this is the case, Time Insensitivity may have implications for a host of psychological outcomes.

This conception of Time Insensitivity may be related to several measures of cognitive flexibility. It is reasonable to assume that if one is structured and strictly adheres to time schedules, that this individual would be characterized by overall trait rigidity. Rigidity is described as a preference for a steady pace, and well-organized, predictable situations (Gough, 2000). Another relevant measure of cognitive flexibility is Need for Cognitive Closure. Need for Closure is described as the “desire for a definite answer on some topic, any answer as opposed to confusion and ambiguity” (Kruglanski, 1989). It reflects a need for clear rules and structure, along with a strong desire to avoid ambiguity. Both Rigidity and Need for Closure seem that they would be related to the Monochronic, fast paced, low Time Insensitive individual.

Similarly, a preference for either Analytical or Dialectical thought (Peng & Nisbett, 1999; Nisbett, Peng, Choi, & Norenzayan, 2001) may be related to Time Insensitivity. Analytic thought, characteristic of Western cultures, is described as a preference for using rules to explain an object’s behavior, a tendency to assign objects to categories, and detaching an object from its context. East Asian cultures have been described as using Dialectic thought, an orientation to the whole context, emphasizing attention to relationships. Dialectic thought is also characterized by a reliance on experience-based knowledge rather than formal logic. Americans favor analytic thought, as suggested by a series of studies requiring American and Chinese participants to rate the likeability of proverbs that were either inherently Analytic or Dialectic (Peng & Nisbett, 1999). This preference can be compared to Hall’s theory of Mono and

Polychronic time perspectives (Hall, 1983; Hall & Hall, 1990). The preference for rules and logic that is inherent to Analytic thought seems to be analogous to Hall's Monochronic perspective, while the emphasis placed on experienced based knowledge and relationships in Dialectic thought seem to be characteristic of the Polychronic perspective.

Time Insensitivity may also be related to psychological Resilience. Resilience is defined as the ability to adjust to shifting and frustrating events and to "bounce back" from negative experiences and (Block & Kremen, 1996; Carver, 1998; Lazarus, 1993; Tugade & Fredrickson, 2002). Resilient individuals do not require consistency and structure, but instead prefer to explore and adapt to situations as they naturally occur. This conception of Resilience is similar to the description of Polychronic individuals, suggesting that Resiliency may be positively related to Time Insensitivity and inversely related to Rigidity, Need for Closure, and Analytical thinking.

In addition to these self-report measures of cognitive flexibility, Time Insensitivity may also be related to increased levels of performance on time pressured cognitive tasks, such as the Stroop task (Stroop, 1935, see MacLeod, 1991 for review). This task includes an inherent time pressure, as individuals are instructed to respond as quickly as possible. The Stroop task is thought to be associated with the executive function of suppressing unwanted overlearned responses (Monsell, 1996; Posner & Synder, 1975). The Alternating block is a variation of the Stroop condition, thought to be related to the executive function of switching from performing one task to another (e.g., Allport, Styles, & Hsieh, 1994; Rogers & Monsell, 1995). This condition involves flexibly switching attention between two different sets of instructions in addition to the

inhibition necessary for the classic Stroop condition. For both conditions in this task, latency is measured in order to assess interference. Individuals with shorter latency are thought to have a greater ability to simultaneously process two contradicting sources of information. In line with Hall's theory of Mono and Polychronic time orientation (Hall, 1983; Hall & Hall, 1990), individuals with a preference for dealing with many things at once (Polychronic and Time Insensitive), should show shorter latency on these two portions of the Stroop task.

Another factor that may be related to Time Insensitivity is the subjective experience of emotion during time pressured situations. Feeling pressured by time is an unpleasant experience. Time Insensitivity, therefore, should be related to less negative emotional experience in the face of time pressure. Support for this hypothesis is offered by an experience sampling study designed to investigate the relation between time awareness, affect, and intrinsic motivation. Time awareness was measured with questions including "What time would you guess it is" "When was the last time you looked at a watch or clock" and "Was time going 1 (very quickly) – 5 (very slowly)". Participants were prompted eight times a day for five days in order to track time and affective experience during the activity that was interrupted by the questionnaire. Results showed that time awareness (low Time Insensitivity) predicts a more negative affective experience (Conti, 2001).

Another study linked time pressure to negative mood and emotional exhaustion (Teuchmann, Totterdell, & Parker, 1999). Emotional exhaustion is described as the primary aspect of burnout (Maslach & Jackson, 1981) and has been linked to many negative outcomes. These negative outcomes include feelings of helplessness,

depression, and low self-esteem (Jackson & Maslach, 1982), an adverse effect on physical health (Burke & Deszca, 1986; Kahill, 1988), and negative effects on interpersonal functioning (Kahill, 1988; Maslach & Jackson, 1985). Results from this experience sampling study showed that time pressure fluctuated together with self-reports of mood and emotional exhaustion, suggesting that the time pressure was related to negative mood and the negative outcomes of emotional exhaustion.

This research suggests that low Time Insensitivity is related to negative affect, but it may also be possible that a relation exists between high Time Insensitivity and more positive emotional experiences. Time Insensitivity may cause more positive emotional experiences due to the decreased pressure experienced by Time Insensitive individuals under time constraints. Positive emotions, however, may also cause individuals to be more Time Insensitive. The broaden-and-build theory of positive emotions predicts that discrete positive emotions broaden the scope of attention and range of thoughts and actions one is currently pondering (Fredrickson 1998, 2000; Fredrickson & Branigan, in press). Similarly, positive emotions could also be associated with Time Insensitivity. For example, when faced with a strict timetable or schedule, experiencing positive emotions may allow the individual to think about several different possible ways spend or structure time.

It is also possible that Time Insensitivity and positive emotions build upon and enhance each other in an upward spiral. The benefits of positive emotions and broadened thinking are thought to build upon each other, resulting in a powerful upward spiral. Broadened thinking created by previous positive emotions will aid in effective coping, which in turn should predict future experiences of positive emotions (Fredrickson &

Joiner, 2002). It is possible that the benefits of positive emotions, broadened thinking, and Time Insensitivity build upon each other in a similar way. Due to the lack of research relating Time Insensitivity and positive emotions, however, this study seeks only to establish a relation between the two and not to determine causality.

Overview of Present Study

The purpose of the present study was to investigate the relations between Time Insensitivity and cognitive flexibility, cognitive performance under time pressure, and subjective emotional experience. Participants completed a self-report measure of Time Insensitivity and various measures of cognitive flexibility and two cognitive time pressured tasks. Self-reports of emotional experience followed each task. I predicted that individuals characterized by high Time Insensitivity would also be characterized by higher cognitive flexibility, exhibit better performance on the cognitive time pressured tasks, and report less negative and more positive emotional experience during these tasks.

Predictions

Prediction 1: Time Insensitivity and Relevant Measures of Cognitive Flexibility

I predicted that Time Insensitivity (measured by the Time Insensitivity Questionnaire and the ZTPI; Zimbardo & Boyd, 1999) would be negatively correlated with self-report measures of cognitive flexibility, such as trait Rigidity (Gough, 1957), Need for Closure (Kruglanski, Webster, & Klem, 1993), and Analytical thinking (Peng & Nisbett, 1999). Time Insensitivity should also be positively correlated with Resilience (Block & Kremen, 1996) and Dialectical Thinking (Peng & Nisbett, 1999).

Prediction 2: Time Insensitivity and Performance on Time Pressure Tasks

I predicted that individuals characterized by Time Insensitivity would exhibit higher levels of performance on cognitive tasks completed under time pressure, compared to those characterized by low Time Insensitivity.

Word Guessing Task. In the Word Guessing Task, participants were given clues and were required to guess as many words as possible under time pressure. Compared to those characterized by low Time Insensitivity, Time Insensitive individuals should (1) evidence a greater number of words identified correctly and (2) progress further into this timed task.

Stroop Task. Compared with participants with low Time Insensitive, high Time Insensitive individuals should exhibit shorter latency (i.e., faster reaction times) on the Stroop and Alternating blocks of this task.

Prediction 3: Time Insensitivity and Emotional Experience

All participants experienced stress related to the time pressure tasks. Individuals characterized by Time Insensitivity, however, should report a less negative and more positive subjective emotional experience in response to time pressure tasks, compared to those characterized by low Time Insensitivity.

Method

Participants

Participants were 65 undergraduate students at Boston College (34 female), ranging from 18 to 21 years old. This sample included 51 European Americans, 7 Asian or Pacific Islanders, 2 Hispanics/Latinos, 1 African American, 2 participants of unspecified ethnic origin, and 1 participant who chose not to provide any demographic information. All participants were remunerated with two research credits necessary for introductory psychology courses at Boston College.

Materials

Time Insensitivity

Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999). Instructions required participants to indicate how characteristic of themselves they would consider each statement on a 5-point Likert-type scale (1 = very uncharacteristic, 5 = very characteristic). Participants completed the entire inventory (See Appendix A), but only the Present-Hedonistic and Future subfactors were analyzed for the present report. For

ease of interpretation, scores on the ZPTI were reversed such that high scores on each subfactor reflect high Time Insensitivity.

Present-Hedonistic orientation. Sample items of the Present-Hedonistic factor include, “I try to live my life as fully as possible, one day at a time” and “I feel that it is more important to enjoy what you are doing than to get work done on time.” An average score was calculated for the fifteen items constructing this subfactor of the ZPTI (Zimbardo & Boyd, 1999). Scores ranged from 2.47 to 4.87 ($M = 3.55$, $SD = .53$), with higher scores indicating Time Insensitivity and lower scores reflecting low Time Insensitivity. There were no significant differences across sex, $t(62) = -.13$, ns, or ethnicity, $t(62) = -1.07$, ns.¹ A reliability analysis of this factor revealed an alpha of .83.

Future orientation. Representative items of the Future factor include, “If things don’t get done on time, I don’t worry about it” and “It upsets me to be late for appointments.” An average score was computed from the thirteen items making up this subfactor of the ZPTI (Zimbardo & Boyd, 1999). Scores ranged from 1.31 to 4.15 ($M = 2.52$, $SD = .62$), and were reverse coded so that higher scores indicate Time Insensitivity and lower scores signify low Time Insensitivity. Men scored significantly higher on this measure than women, $t(62) = 2.39$, $p < .05$, and there were no significant differences due to ethnicity $t(62) = -.17$, ns. A reliability analysis for this scale yielded an alpha of .82.

Time Insensitivity Questionnaire. These items were created in order to directly assess the specific aspects of time orientation, primarily time structure and organization.

An example of an item on this measure is, “I complete tasks as they come without paying too much attention to the time.” Participants rated to what extent the statements characterized them on a 7-point Likert-type scale (1 = not at all, 7 = a great deal). (See Appendix B).

The nine items making up this questionnaire were summed in order to compute a score for this measure. Scores ranged from 16 to 51 ($M = 34.57$, $SD = 7.57$), with higher scores indicating high Time Insensitivity. Men scored significantly higher than women, $t(62) = 2.22$, $p < .05$, and there were no significant differences due to ethnicity, $t(62) = -.06$, ns. A reliability analysis for this scale yielded an alpha of .69.

Composite Time Insensitivity Scale. A composite measure of Time Insensitivity was computed by combining items from the Zimbardo Time Perspective Inventory (Present-Hedonistic and Future subfactors, Zimbardo & Boyd, 1999) and the Time Insensitivity Questionnaire. The intercorrelations between the three measures were very high (Present-Hedonistic and Future; $r = .50$, $p < .001$; Present-Hedonistic and TIQ; $r = .36$, $p < .01$; Future and TIQ; $r = .66$, $p < .001$). The scales were combined by summing the standardized scores for each of the items from each measure. Scores on this combined scale ranged from -38.96 to 46.21 , with higher scores representing high Time Insensitivity and lower scores indicating low Time Insensitivity. A reliability analysis of the 37 items yielded an alpha of .88. There were no significant effects for sex, $t(63) = 1.46$, ns, or ethnicity, $t(63) = -.68$, ns.

Self-report Measures of Cognitive Flexibility

The Gough-Sanford Rigidity Scale. This inventory (Gough, 1957) is used to measure individual differences in overall trait rigidity, not specific to time. This scale consists of 22 items that assess psychological rigidity and flexibility. The participant was asked to rate items on a 6-point Likert-type scale (1 = strongly disagree, 6 = strongly agree). Sample items include, “There is usually only one best way to solve most problems” and “I find it easy to stick to a certain schedule, once I have started it” (See Appendix C).

Scores for this scale were computed by calculating the sum of the 22 items included in this measure ($M = 78.14$, $SD = 11.55$). Scores ranged from 46 to 105, with higher scores representing greater overall rigidity. The alpha reliability for this scale was .74. There were no significant differences due to sex, $t(63) = -.49$, *ns*, or ethnicity, $t(63) = .06$, *ns*.

Need for Closure Scale. The Need for Closure Scale was designed to assess individual differences in the preference for rules and a strong desire to avoid ambiguity (Kruglanski, Webster, & Klem, 1993). This 42-item scale requires the participant to rate the extent to which they agree with items on a 6-point Likert type scale (1 = strongly disagree, 6 = strongly agree). An example item from this scale is, “I dislike questions that can be answered in many ways” (See Appendix D).

Scores were computed by finding the sum of the 42 items. Scores ranged between 88 and 202 ($M = 152.06$, $SD = 21.09$), with higher scores reflecting a high need

for closure. No significant effects due to sex, $t(63) = -.96$, ns, or ethnicity, $t(63) = .93$, ns, emerged on this scale. Reliability for this measure was $\alpha = .88$.

Ego-Resiliency Scale (Block & Kremen, 1996). This fourteen item scale assesses the extent to which participants can modify their responses to the changing demands of various situations. Sample items include, “I enjoy dealing with new and unusual situations”. Participants responded to each item on a 4-point Likert type scale (1 = the statement does not apply at all, 4 = applies very strongly). (See Appendix E).

Scores on this measure ranged from 30 to 53 ($M = 41.8$, $SD = 5.29$). A reliability analysis yielded an alpha of .69. Since this alpha level is low, a second Resilience sum was computed, omitting one item (item 10; See Appendix E), which did not correlate with the other items on the scale. This exclusion raised the alpha level to .73. All other calculations hereafter used this Resilience scale ($M = 38.77$, $SD = 5.35$). There were neither sex differences, $t(62) = -.69$, ns, nor ethnic differences, $t(62) = -.75$, ns, observed on this scale.

Dialectical/Analytical Thinking (Peng & Nisbett, 1999). This measure assesses the participants’ ability to reason about contradiction. This scale consists of 41 proverbs that reflect either Dialectical or Analytical thinking. Dialectical proverbs contain an inherent contradiction, for example, “Absence makes the heart grow fonder.” Analytic proverbs, in contrast, lack this contradiction. An example of an Analytical proverb is, “Practice what you preach.” Participants rated the likeability of each proverb based on a 7-point Likert-type scale (1 = not at all, 7 = a great deal). (See Appendix F)

A separate Dialectical and Analytic sum was calculated for each participant. Scores on the Dialectical scale ranged from 2.46 to 5.63 ($M = 4.14$, $SD = .66$). Participants' scores on the Analytical scale ranged from 2.39 to 5.17 ($M = 4.04$, $SD = .56$). A reliability analysis yielded an alpha of .77 for the Dialectical scale and .64 for the analytic scale. No sex, $t(62) = .086$, ns, or ethnic differences, $t(62) = .599$, ns, emerged for the Dialectic scale. Similarly, sex, $t(62) = -1.08$, ns, and ethnic differences, $t(62) = 1.10$, ns, were absent from the Analytic scale.

Cognitive Performance Tasks

Two tasks were administered to all participants to examine cognitive performance under time pressure.

Word Guessing Task. This task was developed in order to measure individuals' ability to generate word associations under time pressure. Participants were instructed to guess the word whose meaning was being described through various clues by the experimenter, and to “*guess as many words as you can in the given time limit*” (procedure adapted from electronic game, Catchphrase by Hasbro) (See Appendix G for full instructions). All participants received the same list of words and clues (See Appendix H for stimuli). Four clues were provided one at a time for each word and the experimenter recorded the number of clues given and whether the word was guessed correctly. Time pressure was induced in this task through an auditory timer played on the computer. The timer consisted of four phases; with the beeps becoming progressively faster until a buzzer signaled that time was expired. This task lasted 162 seconds.

Performance was assessed in two ways: (1) percentage of words correctly identified and (2) number of words reached by participant (e.g., how far the participant advanced into the task). The mean percentage of words correctly identified was 83.86% ($SD=.07$). Participants progressed a mean of 20.97 words ($SD=1.70$) into the task.

Stroop Task. This computerized task consisted of four Stroop naming conditions. Each condition consisted of 8 practice trials and 24 experimental trials. The task was presented on a 17-inch Macintosh flat panel monitor. Participants responded by pressing one of four labeled keys on the keyboard (keys a, f, j, ; corresponded respectively to blue, black, green, or red) and were instructed to progress through the task as quickly as possible without sacrificing accuracy (See Appendix I for full instructions). Each participant received the four different naming conditions in the same order, as previous studies have shown no order effects (Phillips, Bull, Adams, & Fraser, 2002).

The control condition required participants to name the color of three Xs (XXX) and was used as a baseline measure. In the color word condition, participants were asked to identify the meaning of the word that was printed in an incompatible color. The classic Stroop condition required the participant to inhibit the meaning of the word in order to report the display color of the text (i.e., to respond with “red” when the word black was printed in red ink) (See Appendix J for examples). In the Alternating condition, each trial was preceded by an instruction screen informing the participant to either report the color of the text (display color) or the meaning of the word (color word). The instructions alternated between trials, requiring the participants to switch their attention between the two demands of the task. The Alternating condition was included in the present study in order to observe performance under different levels of cognitive

load. The Alternating condition is the most complex portion of the task (Phillips, Bull, Adams, & Fraser, 2002), as it requires both inhibition and attention switching. It is possible that Time Insensitivity is related to better cognitive performance under moderate load (classic Stroop condition), but is unrelated to performance under high cognitive load (Alternating condition).

To assess the level of performance on the Stroop task, response latency to each trial was examined. For the Stroop condition, latency ranged from 727.17 ms to 1954.38 ms ($M=1219.02$, $SD=249.18$). In the Alternating block, latency ranged from 779.88 ms to 2455.79 ms ($M=1467.66$, $SD=343.70$). See Table 1 for descriptive statistics for latency during the Stroop and Alternating conditions of the Stroop task.

Self-Report Measures

Reaction to time pressure tasks. After each time pressure task, the participant was presented with pencil and paper measures in order to assess their subjective experience of the previous task.

Manipulation Check. Participants were asked, “How stressed out did you feel while completing this task” in order to explore whether the tasks induced a moderate amount of stress as we intended. Responses were recorded on a 7-point Likert-type scale (1 = not at all, 7 = a great deal).

Emotional Experience. An emotion report form was given to assess subjective responses during the tasks. Participants rated how much each of the 26 emotions was experienced during the previous task. Ratings were made on a 7-point Likert type scale (1 = not at all, 7 = a great deal). The list of emotions on this form included amusement,

anger, anxiety, challenge, contempt, contentment, disgust, disappointment, eagerness, embarrassment, enthusiasm, fear, frustration, guilt, happiness, hope, interest, joy, love, nervousness, pride, relief, sadness, shame, surprise, and threat (See Appendix J).

Word Guessing Task. Across all participants, challenge was the most highly rated emotion in response to this task ($M = 5.12$, $SD = 1.18$), followed by interest ($M = 4.95$, $SD = 1.04$). See Table 2 for a summary of the descriptive analyses of participants' self-reported emotions for this task.

Stroop Task. Challenge was also the most highly rated emotion on the Stroop task ($M = 5.49$, $SD = 1.06$), with interest again reported as the second highest ($M = 4.32$, $SD = 1.63$). See Table 3 for a summary of the descriptive analyses of participants' self-reported emotions for the Stroop task.

Procedure

Session I:

Participants were run singly in two laboratory sessions by the same trained experimenter. The laboratory room was divided by a partition, with the computer on one side of the partition and a desk on the other. On arrival to the laboratory, the participant was greeted by the experimenter and told that he or she would be participating in a study about emotions. The experimenter was seated directly in front of the computer, facing the participant, who was seated to the side. The participant completed the consent form and the experimenter began to verbally deliver instructions for the Word Guessing task. The participant was asked to “*guess as many words as possible in the given time limit*” from the clues presented by the experimenter. Participants were told that four clues

would be presented one at a time for each word. If the word was not correctly identified after four clues, the experimenter would say, “*next word*” and move on to the next set of clues. If the participant had no further questions, the experimenter started the auditory timer and began reciting the clues. The experimenter recorded both the number of clues that were presented and whether the participant ever correctly identified the word. On completion of this task, the participant reported on his or her subjective emotional experience.

At the end of this first session, the participant was given a pencil and paper battery with all of the self-report measures, including the Ego-Resiliency Scale (Block & Kremen, 1996), the Time Insensitivity Questionnaire, the Dialectical/Analytical Thinking Scale (Peng & Nisbett, 1999), the Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999), the Need For Closure Scale (Kruglanski, Webster, & Klem, 1993), and the measure for Rigidity (Gough, 1957). The last page of this battery requested demographic information. This battery was given at the end of the session in order to avoid priming effects of the Time Insensitivity measures on the Word Guessing task. The participant completed this battery while the experimenter waited on the opposite side of the partition.

Session II:

Each participant returned to the laboratory within two to four days of the first session and was met by the same experimenter. The participant was welcomed, seated in front of the computer monitor, and given the instructions for the Stroop task. The participant was told that the goal of the task was to “progress through the task as quickly as possible but without sacrificing accuracy”. The participants were asked to respond to the instructions presented on the monitor (display color of text or meaning of word) by

pressing one of four labeled keys on the keyboard. Visual examples were also given in order to clarify the distinction between “color word” and “display color” (See Appendix J).

The experimenter returned to the opposite side of the partition until the participant verbally signified that the task was completed. At this point, the experimenter returned with the self-report measure of emotion to assess the participant’s subjective report for the task. Finally, participants were debriefed fully, remunerated, and thanked for their participation.

Results

Prediction 1: Time Insensitivity and Self-Reports of Cognitive Flexibility

As predicted, individuals who described themselves as Time Insensitive also reported being less Rigid and having less Need for Closure. A trend emerged relating Time Insensitivity and Analytic Thinking. High Insensitivity to time was also significantly positively related to Resilience, but not to Dialectical Thinking. These findings indicate that individuals characterized by Time Insensitivity also characterized by less psychological Rigidity, less Need for Cognitive Closure, higher Resiliency, and less Analytical thinking (See Table 4).

Prediction 2: Time Insensitivity and Performance on Time Pressured Tasks

Contrary to predictions, individuals who were Time Insensitive did not perform better on the Word Guessing task. These individuals did not identify more words correctly ($r = -.1$, ns) or reach a greater number of words ($r = .03$, ns), suggesting that Time Insensitivity and performance on the Word Guessing task was unrelated.

As predicted, individuals characterized by high Time Insensitivity exhibited faster mean reaction times during the Stroop block when controlling for baseline reaction times ($b = -3.33$, $B = -.22$, $t = -2.36$, $p < .05$). This finding suggests that participants with high Time Insensitivity had less difficulty dealing with the two contradicting demands of the task under time pressure. This finding, however, was not replicated during the Alternating block of the Stroop task (See Table 5). The regression analysis examining the relation between Time Insensitivity and latency when controlling for baseline was insignificant ($b = -3.60$, $B = -.18$, $t = -1.57$, ns).

Prediction 3: Time Insensitivity and Emotional Experience

It was predicted that Time Insensitive individuals would report a less negative and more positive subjective emotional experience during the cognitive performance tasks. This prediction was partially supported for the Stroop task, as high Time Insensitive participants reported less negative subjective emotion than low Time Insensitive individuals, but did not report a more pleasant subjective experience.

Word Task. There were no significant relations between Time Insensitivity and reports of emotional experience for the Word Guessing task (see Table 6).

Stroop Task. Time Insensitivity was significantly related to lower reports of threat ($r = -.28$, $p < .05$) and marginally lower reports of fear ($r = -.22$, $p < .10$), suggesting that these participants had a less negative emotional experience than those with low Time Insensitivity. There was also a trend relating Time Insensitivity to interest ($r = -.21$, $p < .10$). See Table 7 for a full report of the relations between Time Insensitivity and subjective emotion reports on the Stroop task.

Discussion

This study examined whether individual differences in Time Insensitivity are related to cognitive flexibility, cognitive performance, and subjective emotional experience. I predicted that high Time Insensitivity would be related to measures of cognitive flexibility such as Rigidity, Need for Closure, Resilience, and Analytic and Dialectical Thinking. I also predicted that these individuals would perform more effectively on time pressured cognitive tasks and experience less negative and more positive emotion during these tasks. Overall, the results of the present study lend partial support to these predictions.

Individuals characterized by Time Insensitivity reported less trait Rigidity, less Need for Closure, and higher Resilience, suggesting that these individuals had less of a preference for structure, less of a need for clear rules, less of a need to avoid ambiguity, and a greater ability to adapt to changing situational demands, similar to the Polychronic individuals discussed earlier (Hall 1983; Hall & Hall, 1990). While results did not support the prediction that Insensitivity to time would be related to higher levels of performance on the Word Guessing task, a significant relation did emerge between Time Insensitivity and the Stroop condition. This finding suggests that Time Insensitive individuals were better able to handle two conflicting demands under time pressure, enabling them to simultaneously process two contradicting sources of information and inhibit the irrelevant source with greater ease. This finding was not replicated, however, in the Alternating condition. Finally, individuals characterized by Time Insensitivity reported a less negative subjective emotional experience in response to the time pressure

tasks, replicating the findings of previous studies (Conti, 2001; Teuchmann, Totterdell, & Parker, 1999). Interestingly, the predicted link between Time Insensitivity and positive emotions emerged only as a trend in the present study.

Debriefing interviews revealed a possible explanation for the null finding for the Word Guessing task. Many participants reported that the task felt more like a game rather than a stressor, as it was adapted from a popular electronic game (Catchphrase, by Hasbro). In fact, the levels of reported stress for this task ($M = 3.38$, $SD = 1.45$) were significantly lower than levels of reported stress for the Stroop tasks ($M = 4.05$, $SD = 1.51$). In addition, some participants reported “tuning out” the auditory timer, which served as the time pressure induction for this task. These reports suggest that perhaps some participants did not perceive any time pressure at all while completing this task.

While this failure to induce time pressure during the Word Guessing task is a limitation to the design of the study, this explanation could also reveal an effective coping strategy used by certain participants. “Tuning out” the auditory timer allowed these individuals to complete the task without any perceived time pressure, making the task less stressful. Since participants did not find this task stressful, it seems understandable that Time Insensitivity would not be related to performance on this task. In future studies, it will be important to choose performance tasks that more effectively induce time pressure and are moderately stressful for participants.

In the present study, the Alternating block was added in order to assess whether switching between the two different demands of the task would be less difficult for individuals with a high Time Insensitivity. Time Insensitivity, however, was not significantly related to latency for the Alternating condition of the Stroop task. In an

attempt to understand this lack of findings, I developed a hypothesis post-hoc involving the trade off between speed and accuracy on this task. Presumably, Time Insensitive individuals were less affected by the time pressure of the task. Perhaps these individuals placed a greater emphasis on making accurate responses rather than rapid ones, resulting in longer latency. Analyses revealed, however, that Time Insensitivity and the percentage of correct responses during the Alternating condition were unrelated.

A second explanation for this null finding was discussed earlier, suggesting that the benefits of Time Insensitivity may not extend to situations involving heavy cognitive load. In fact, the Alternating block is thought to be activating a different executive function than the Stroop task, and therefore may not produce similar results (Ward, Roberts, & Phillips, 2001). These researchers found no relation between task-switching costs (reaction times on Alternating block when controlling for Stroop block) and stroop costs (reaction times on Stroop block when controlling for baseline), suggesting that the two conditions are largely unrelated. In a post-hoc analysis, I also calculated task-switching and stroop costs and found no relation between the two variables. These null results provide support for the existence of different specialized control processes inherent to these two different types of Stroop conditions. It is possible that Time Insensitivity is related to the executive function responsible for inhibition under moderate load (Stroop condition) but not for attention switching under heavy load (Alternating condition).

The results of this study suggest that an Insensitive Time orientation may have some beneficial psychological outcomes. Individuals characterized by high Insensitivity to time reported less negative subjective emotional experiences on Stroop Task. In

addition, Time Insensitive individuals were characterized by higher Resilience, which is conceptualized as the ability to cope with stress (Block & Kremen, 1996; Carver, 1998; Lazarus, 1993; Masten, 1989). Resilience is also conceptualized as the ability to flexibly allocate attention in response to changing situational demands (Block & Kremen, 1996; Lazarus, 1993), even if these situations are deemed ambiguous (Lazarus, 1993).

The present study suggests that these characteristics might provide advantages on cognitive tasks such as the Stroop task. While the Stroop task assesses one specific type of executive function (i.e., inhibition), it might be more appropriate to measure several other types of executive functions such as planning or problem solving in relation to Time Insensitivity. It would also be valuable to observe the relation between Time Insensitivity and coping outcomes in order to further these preliminary findings regarding beneficial outcomes of Time Insensitivity.

There is already some evidence that the way people are affected by time plays a role in their ability to cope with stress. One such study examined various self-reports, including subjective experiences of stress, environmental stressors, state-trait anxiety, and physical symptoms. Responses identified pace of life as one psychosocial characteristic that is related to the ability to cope with stress. Pace of life and control of emotions were identified as mediators between life stressors and the coping response. Results showed that individuals who felt less rushed and had more emotional control coped better with life stressors (Witmer, Rich, Barcikowski, & Mague, 1983). These findings suggest that individuals exhibiting greater Time Insensitivity (feeling less rushed) may also show regulatory and coping benefits when faced with stress.

Previous research also suggests that low Time Insensitivity may be related to various negative outcomes. For example, low Time Insensitivity (or time urgency, defined as the pressure to use time efficiently and a preoccupation with deadlines; Gastorf, 1980) is characteristic of the Type A coronary-prone behavior pattern (Friedman & Rosenman, 1974). In one experiment, individuals characterized by the Type A behavior pattern arrived significantly earlier to an experimental session than Type B participants (Gastorf, 1980). Another study highlighted the impatient tendencies of Type A individuals (Burnam, Pennebaker, & Glass, 1975). In this study, Type A participants judged the lapse of one minute significantly sooner than Type B participants. Taken together, these studies suggest that low Time Insensitivity may be related to increased risk for coronary heart disease.

It is important to keep in mind that previous research and the present study have been only correlational in nature. It will be necessary for future studies to manipulate Time Insensitivity in order to test the directional links between Time Insensitivity and the outcome variables examined in the present study. For example, if time pressure were induced in some participants by emphasizing the importance of finishing a task on time, it would be possible to see if individuals in the time pressure condition would perform less effectively on a cognitive task or report a more negative subjective emotional experience compared to individuals in a control condition.

It would also be important to conduct a similar study on a cross-cultural sample. While it is logical to assume that within all cultures, some people are more sensitive to time than others, a study that compared data collected from a fast paced, Monochronic sample and a slow paced Polychronic sample would extend the hypotheses presented in

this study. The sample used in this study was extremely homogenous, yet predicted relationships still emerged, providing a valuable foundation for future research on this topic.

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Appendices

- A. Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999)
- B. Time Insensitivity Questionnaire
- C. Rigidity Scale (Gough, 1957)
- D. Need for Cognitive Closure Scale (Kruglanski, Webster, & Klem, 1993)
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- F. Analytical/Dialectical Thinking Proverb Scale (Peng & Nisbett, 1999)
- G. Instructions for Word Guessing Task
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- L. Tables
 - 1. Descriptive Statistics for Stroop and Alternating Block Latency
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 - 4. Correlations between Time Insensitivity and Self-report Measures of Cognitive Flexibility
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6. Correlations between Time Insensitivity and Self-report Measures of Emotion for the Word Guessing Task
7. Correlations between Time Insensitivity and Self-report Measures of Emotion for the Stroop Task

Appendix A

Zimbardo Time Perspective Questionnaire (Zimbardo & Boyd, 1999)

Instructions: Please read each item and, as honestly as you can, answer the following question: "How characteristic or true is this of you?"

1	2	3	4	5
Very Uncharacteristic		Neutral		Very Characteristic

- _____ 1. I believe that getting together with one's friends to party is one of life's important pleasures. ^A
- _____ 2. Familiar childhood sights, sounds, smells often bring back a flood of wonderful memories.
- _____ 3. Fate determines much in my life.
- _____ 4. I often think of what I should have done differently in my life.
- _____ 5. My decisions are mostly influenced by people and things around me.
- _____ 6. I believe that a person's day should be planned ahead each morning. ^B
- _____ 7. It gives me pleasure to think about my past.
- _____ 8. I do things impulsively. ^A
- _____ 9. If things don't get done on time, I don't worry about it. ^B
- _____ 10. When I want to achieve something, I set goals and consider specific means for reaching those goals. ^B
- _____ 11. On balance, there is much more good to recall than bad in my past.
- _____ 12. When listening to my favorite music, I often lose all track of time. ^A
- _____ 13. Meeting tomorrow's deadlines and doing other necessary work comes before tonight's play. ^B

- _____ 14. Since whatever will be will be, it doesn't really matter what I do.
- _____ 15. I enjoy stories about how things used to be in the "good old times."
- _____ 16. Painful past experiences keep being replayed in my mind.
- _____ 17. I try to live my life as fully as possible, one day at a time. ^A
- _____ 18. It upsets me to be late for appointments. ^B
- _____ 19. Ideally, I would live each day as if it were my last. ^A
- _____ 20. Happy memories of good times spring readily to mind.
- _____ 21. I meet my obligations to friends and authorities on time. ^B
- _____ 22. I've taken my share of abuse and rejection in the past.
- _____ 23. I make decisions on the spur of the moment. ^A
- _____ 24. I take each day as it is rather than try to plan it out. ^B
- _____ 25. The past has too many unpleasant memories that I prefer not to think about.
- _____ 26. It is important to put excitement in my life. ^A
- _____ 27. I've made mistakes in the past that I wish I could undo.
- _____ 28. I feel that it's more important to enjoy what you're doing than to get work done on time. ^A
- _____ 29. I get nostalgic about my childhood.
- _____ 30. Before making a decision, I weigh the costs against the benefits. ^B
- _____ 31. Taking risks keeps my life from becoming boring. ^A
- _____ 32. It is more important for me to enjoy life's journey than to focus only on the destination. ^A
- _____ 33. Things rarely work out as I expected.
- _____ 34. It is hard for me to forget unpleasant images of my youth.

- _____ 35. It takes joy out of the process and flow of my activities, if I have to think about goals, outcomes, and products.
- _____ 36. Even when I am enjoying the present, I am drawn back to comparisons with similar past experiences.
- _____ 37. You can't really plan for the future because things change so much.
- _____ 38. My life path is controlled by forces I cannot influence.
- _____ 39. It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway.
- _____ 40. I complete projects on time by making steady progress. ^B
- _____ 41. I find myself tuning out when family members talk about the way things used to be.
- _____ 42. I take risks to put excitement in my life. ^A
- _____ 43. I make lists of things to do. ^B
- _____ 44. I often follow my heart more than my head. ^A
- _____ 45. I am able to resist temptations when I know that there is work to be done. ^B
- _____ 46. I find myself getting swept up in the excitement of the moment. ^A
- _____ 47. Life today is too complicated; I would prefer the simpler life of the past.
- _____ 48. I prefer friends who are spontaneous rather than predictable. ^A
- _____ 49. I like family rituals and traditions that are regularly repeated.
- _____ 50. I think about the bad things that have happened to me in the past.
- _____ 51. I keep working at difficult, uninteresting tasks if they will help me get ahead. ^B
- _____ 52. Spending what I earn on pleasures today is better than saving for tomorrow's security.
- _____ 53. Often luck pays off better than hard work.

_____ 54. I think about the good things that I have missed out on in my life.

_____ 55. I like my close relationships to be passionate.^A

_____ 56. There will always be time to catch up on my work.^B

A = Items included in the Present-Hedonistic Subfactor

B = Items included in the Future Subfactor (Items 9, 24, and 56 were reverse coded)

Appendix B

Time Insensitivity Questionnaire

Instructions: Please indicate the extent to which these statements characterize you. Please write the number next to each statement:

1	2	3	4	5	6	7
Not at all		Somewhat			A great deal	

- 1) I structure my day's activities according to the hours of the clock. _____
- 2) When engaged in something, I lose track of the time. _____
- 3) I complete tasks as they come without paying too much attention to the time. _____
- 4) I am dependent on my planner or calendar. _____
- 5) I am always very aware of the time. _____
- 6) I am not bothered if I do not finish a task on time. _____
- 7) I am dependent on my watch. _____
- 8) It is important to take breaks from work to spend time interacting with people. _____
- 9) Deadlines are absolute and should always be met. _____

Please respond to these questions with an exact number of minutes (please avoid ranges):

- 1) If you had planned to meet a friend at a specified time, how long after that time passed would you consider them to be late?
- 2) If you had planned to meet a friend at a specified time, how long before that time would they have to arrive for you to consider them early?
- 3) If you had planned to meet a professor at a specified time, how long after that time passed would you consider them to be late?
- 4) If you had planned to meet a professor at a specified time, how long before that time would they have to arrive for you to consider them early?

Appendix C

Rigidity Scale (Gough, 1957)

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

- _____ 1. I am often the last one to give up trying to do a thing.
- _____ 2. There is usually only one best way to solve most problems.
- _____ 3. I prefer work that requires a great deal of attention to detail.
- _____ 4. I often become so wrapped up in something I am doing that I find it difficult to turn my attention to other matters.
- _____ 5. I dislike to change my plans in the midst of an undertaking.
- _____ 6. I never miss going to church.
- _____ 7. I usually maintain my own opinions even though many other people may have a different point of view.
- _____ 8. I find it easy to stick to a certain schedule, once I have started it.
- _____ 9. I do not enjoy having to adapt myself to new and unusual situations.
- _____ 10. I prefer to stop and think before I act even on trifling matters.
- _____ 11. I try to follow a program of life based on duty.
- _____ 12. I usually find that my own way of attacking a problem is best, even though it doesn't always seem to work in the beginning.
- _____ 13. I am a methodical person in whatever I do.
- _____ 14. I think it is usually wise to do things in a conventional way.
- _____ 15. I always finish tasks I start, even if they are not very important.
- _____ 16. I often find myself thinking of the same tunes or phrases for days at a time.
- _____ 17. I have a work and study schedule that I follow carefully.
- _____ 18. I usually check more than once to be sure that I have locked a door, put out the light, or something of the sort.
- _____ 19. I have never done anything dangerous for the thrill of it.
- _____ 20. I believe that promptness is a very important personality characteristic.
- _____ 21. I am always careful about my manner of dress.
- _____ 22. I always put on and take off my clothes in the same order.

Appendix D

Need for Closure Scale (Kruglanski, Webster, & Klem, 1993)

Attitude, Belief, and Experience Survey

Instructions: Please rate how much you agree or disagree with each of the following statements

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

- _____ 1. I think that having clear rules and order at work is essential for success.
- _____ 2. Even after I've made up my mind about something, I am always eager to consider a different opinion.
- _____ 3. I don't like situations that are uncertain.
- _____ 4. I dislike questions which could be answered in many different ways.
- _____ 5. I *like* to have friends who are unpredictable.
- _____ 6. I find that a well ordered life with regular hours suits my temperament.
- _____ 7. When dining out, I like to go to places where I have been before so that I know what to expect.
- _____ 8. I feel uncomfortable when I don't understand the reason why an event occurred in my life.
- _____ 9. I feel irritated when one person disagrees with what everyone else in a group believes.
- _____ 10. I hate to change my plans at the last minute.
- _____ 11. I don't like to go into a situation without knowing what I can expect from it.
- _____ 12. When I go shopping, I have difficulty deciding exactly what it is that I want.
- _____ 13. When faced with a problem I usually see the one best solution very quickly.

- _____ 14. When I am confused about an important issue, I feel very upset.
- _____ 15. I tend to put off making important decisions until the last possible moment.
- _____ 16. I usually make important decisions quickly and confidently.
- _____ 17. I would describe myself as indecisive.
- _____ 18. I think it is fun to change my plans at the last moment.
- _____ 19. I enjoy the uncertainty of going into a new situation without knowing what
might happen.
- _____ 20. My personal space is usually messy and disorganized.
- _____ 21. In most social conflicts, I can easily see which side is right and which is wrong.
- _____ 22. I tend to struggle with most decisions.
- _____ 23. I believe that orderliness and organization are among the most important
characteristics of a good student.
- _____ 24. When considering most conflict situations, I can usually see how both sides
could be right.
- _____ 25. I don't like to be with people who are capable of unexpected actions.
- _____ 26. I prefer to socialize with familiar friends because I know what to expect from
them.
- _____ 27. I think that I would learn *best* in a class that *lacks* clearly stated objectives and
requirements.
- _____ 28. When thinking about a problem, I consider as many different opinions on the
issue as possible.
- _____ 29. I like to know what people are thinking all the time.
- _____ 30. I dislike it when a person's statement could mean many different things.

- _____ 31. It's annoying to listen to someone who cannot seem to make up his or her mind.
- _____ 32. I find that establishing a consistent routine enables me to enjoy life more.
- _____ 33. I enjoy having a clear and structured mode of life.
- _____ 34. I *prefer* interacting with people whose opinions are very different from my own.
- _____ 35. I like to have a place for everything and everything in its place.
- _____ 36. I feel uncomfortable when someone's meaning or intention is unclear to me.
- _____ 37. When trying to solve a problem I often see so many possible options that it's
confusing.
- _____ 38. I always see many possible solutions to problems I face.
- _____ 39. I'd rather know bad news than stay in a state of uncertainty.
- _____ 40. I do not usually consult many different opinions before forming my own view.
- _____ 41. I dislike unpredictable situations.
- _____ 42. I *dislike* the routine aspects of my work (studies).

Appendix E

Ego-Resiliency Scale (Block & Kremen, 1996)

Please read each item below and circle the number that best corresponds to the statement, using the following scale:

	1 -----	2 -----	3 -----	4
	Does not apply at all	Applies slightly	Applies somewhat	Applies very strongly
1) I am generous with my friends.	1	2	3	4
2) I quickly get over and recover from being startled.	1	2	3	4
3) I enjoy dealing with new and unusual situations.	1	2	3	4
4) I usually succeed in making a favorable impression on people.	1	2	3	4
5) I enjoy trying new foods I have never tasted before.	1	2	3	4
6) I am regarded as a very energetic person.	1	2	3	4
7) I like to take different paths to familiar places.	1	2	3	4
8) I am more curious than most people.	1	2	3	4
9) Most of the people I meet are likeable.	1	2	3	4
10) I usually think carefully about something before acting.	1	2	3	4
11) I like to do new and different things.	1	2	3	4
12) My daily life is full of things that keep me interested.	1	2	3	4
13) I would be willing to describe myself as a pretty "strong" personality.	1	2	3	4
14) I get over my anger at someone reasonably quickly.	1	2	3	4

Appendix F

Dialectical/Analytical Thinking (Peng & Nisbett, 1999)

Instructions: Please use the following scale to rate how much you like this proverb. Write your responses on the lines next to the proverbs.

1	2	3	4	5	6	7
Not at all			Somewhat	A great deal		

- ____ 1. Truth is stranger than fiction ^B
- ____ 2. Beware of your friends, not your enemies ^B
- ____ 3. The great tree attracts greater wind ^B
- ____ 4. Practice what you preach ^A
- ____ 5. You can never catch up with a fool in his folly ^A
- ____ 6. The light of a hundred stars does not equal the light of the moon ^A
- ____ 7. Absence makes the heart grow fonder ^B
- ____ 8. A man is stronger than iron and weaker than a fly ^B
- ____ 9. Garden flowers are not as fragrant as the flowers of the field, but the flowers of the field do not last as long ^B
- ____ 10. Where there's will, there is a way ^A
- ____ 11. If things don't get better, they surely will get worse ^A
- ____ 12. Money hides a thousand deformities ^A
- ____ 13. All that glitters is not gold ^B
- ____ 14. There is a new question to every answer ^B
- ____ 15. Straight trees are chopped first, sweet wells are drained fast ^B
- ____ 16. What we speak of by day we dream of by night ^A
- ____ 17. Good friends settle their accounts speedily ^A
- ____ 18. Make haste slowly ^B
- ____ 19. Too much honor is half a shame ^B
- ____ 20. A man should live if only to satisfy his curiosity ^A
- ____ 21. Actions speak louder than words ^B

- _____22. Every uphill has its downhill ^B
- _____23. A great wisdom can look like a great fool ^B
- _____24. Don't put all your eggs in one basket ^A
- _____25. For example is no proof ^A
- _____26. The melon-seller always shouts his melons are the sweetest ^A
- _____27. Every cloud has a silver lining ^B
- _____28. Too humble is half proud ^B
- _____29. It is easy to govern a kingdom but difficult to rule one's family ^B
- _____30. Half a loaf of bread is better than none ^A
- _____31. A wounded spirit is hard to heal ^A
- _____32. Don't loose the falcon until you see the hare ^A
- _____33. The bigger they come, the harder they fall ^B
- _____34. Better an eloquent silence than an eloquent speech ^B
- _____35. Sorrow is born of excessive joy ^B
- _____36. One against all is certain to fall ^A
- _____37. If there is room for question, something must be wrong ^A
- _____38. The child is a father to a man ^B
- _____39. Half a truth is still a whole lie ^B
- _____40. Bitter words are better medicines, sweet words bring illness ^B
- _____41. Look before you leap ^A

A = Items creating the Analytical Thinking Scale

B = Items creating the Dialectical Thinking Scale

Appendix G

Instructions for Word Guessing Task

“For this part of the study, your task is to try to guess out loud as many words from the clues that I say to you in the given time. The task is timed using a beeping device that consists of 4 stages, with the beeps becoming progressively faster as time expires. I will be saying the clues continuously and you can also guess words continuously. When you guess the word correctly, I will nod and move onto the next set of clues. There are only four clues per word, so if you do not guess the word after 4 clues, I will say “next word” and move on to the clues for the next word. Any word that you get after I have begun saying the clue for the next word will not count. Remember, your goal is to guess as many words as you can in the given time limit. Do you have any questions?”

Appendix H

Stimuli Checklist for Word Guessing Task

Word	Clues	Clue	Word
Mirror	Lets you see your reflection Looking glass Found in the bathroom _____ on the wall		
Beard	Facial Hair Not a mustache but a _____ Hair on your chin Men can grow this, but women can't		
Penny	The smallest denomination of money Its copper There is a portrait of Lincoln on it See a _____ pick it up, all day long you'll have good luck		
Horizon	Where the sun sets Someplace you can see, but can never go The furthest point you can see A line		
Stem	Part of a flower The base Leaves grow on this Not the petals, but the _____		
Comedy	Makes you laugh Type of movie Opposite of tragedy Stand up		
Lock	Something that keeps people out It helps keep people safe You can pick this It is usually found on a door		
Shirt	Type of clothing You need to wear one in a restaurant I'd give you the _____ off my back Can be short sleeves or button down		
Trumpet	It is made of brass A type of horn Not a bugle, but a _____ Donald _____		
Adult	Not a child but a _____ Your parents Authority Person over 18 years old		

Cave	Its found in the mountains A cold, dark place Bats live here Stalagmites		
Critic	A reviewer Harsh and disapproving Movie _____ Siskel & Ebert		
Ranger	A park _____ Someone with authority Texas baseball team Walker, Texas _____		
Cellar	Part of a house Dark and damp Bottom level A wine _____		
Forest	Green It's scary at night Sherwood _____ Tropical Rain _____		
Bath	Way to clean yourself Used to relax Used with babies Bubble _____		
Cavalry	Soldiers A division of the army Used during the civil war Troops on horseback		
Garbage	It smells bad You put it in a can Something that is worthless You have to take it out		
Exact	Perfect Precise On the mark Please pay with _____ change		
Hollow	A shell To scoop out Sleepy _____ Empty inside		
Sarcasm	Sardonic Type of humor Satire Mocking		

Ritual	Something people do repeatedly A particular way of doing things May be religious Ceremony		
Blimp	It can fly It is slow Can be found at a sporting event Hindenberg		
Cotton	Grown on plants White Crop grown in the south Fabric		
Compass	Small and round Tool Hiking Gives direction		

Appendix I

Instructions for Stroop Task

“The purpose of this task is for you to progress through it as quickly as possible without sacrificing accuracy. (Read instructions on computer monitor and indicate keyboard response keys). The first set of trials will simply be Xs, but as the task progresses, words will be presented instead of Xs. Be sure to pay attention to the instructions as they appear throughout the task because they will change. Please be aware that display color refers to the color of the text and color word refers to the word that you are reading.”

(Show visual instructions)

Appendix J

Visual Stroop Instructions

COLOR WORD

SCREEN SHOWS:

YOUR ANSWER:

BLACK

BLK

RED

RD

BLUE

BLU

GREEN

GRN

DISPLAY COLOR

SCREEN SHOWS:

YOUR ANSWER:

XXXX

BLK

BLACK

BLK

RED

BLK

BLACK

RD

Appendix K

Emotion Report

Instructions: For each of the terms, please indicate the extent to which you felt each emotion **as you were completing the (Word / Color Word Task)** using the following scale. Please write the number next to each emotion term:

1	2	3	4	5	6	7
Not at all			Somewhat			A great deal

_____ Amusement

_____ Guilt

_____ Anger

_____ Happiness

_____ Anxiety

_____ Hope

_____ Challenge

_____ Interest

_____ Contempt

_____ Joy

_____ Contentment

_____ Love

_____ Disgust

_____ Nervousness

_____ Disappointment

_____ Pride

_____ Eagerness

_____ Relief

_____ Embarrassment

_____ Sadness

_____ Enthusiasm

_____ Shame

_____ Fear

_____ Surprise

_____ Frustration

_____ Threat

Are there any other emotions that you feel? _____

What is the greatest emotion that you feel overall? _____

Appendix M

Tables

Table 1

*Descriptive Statistics for Stroop and Alternating Block Latency Times in Milliseconds**(N=65)*

Condition	Minimum	Maximum	Mean	Standard Deviation
Stroop	727.17	1954.38	1219.02	249.18
Alternating	779.88	2455.79	1467.66	343.70

Table 2

*Descriptive Statistics for Subjective Reports of Emotion for the Word Guessing Task**(N=65)*

Emotion	Mean	Standard Deviation
Amusement	4.32	1.21
Anger	1.43	.73
Anxiety	3.63	1.62
Challenge	5.12	1.18
Contempt	1.58	.93
Contentment	3.02	1.39
Disgust	1.23	.52
Disappointment	2.28	1.21
Eagerness	4.72	1.22
Embarrassment	2.26	1.36
Enthusiasm	4.22	1.28
Fear	1.60	.97
Frustration	3.29	1.54
Guilt	1.18	.53
Happiness	2.92	1.27
Hope	2.48	1.34
Interest	4.95	1.04
Joy	2.48	1.12
Love	1.18	.53
Nervousness	3.58	1.69
Pride	3.22	1.37
Relief	3.09	1.55
Sadness	1.15	.51
Shame	1.52	1.05
Surprise	2.42	1.38
Threat	1.62	1.14

Table 3

Descriptive Statistics for Subjective Reports of Emotion for the Stroop Task (N=65)

Emotion	Mean	Standard Deviation
Amusement	4.00	1.55
Anger	1.80	1.18
Anxiety	3.65	1.58
Challenge	5.49	1.06
Contempt	1.58	1.17
Contentment	2.54	1.39
Disgust	1.31	.86
Disappointment	2.26	1.37
Eagerness	3.92	1.60
Embarrassment	2.22	1.41
Enthusiasm	3.42	1.68
Fear	1.45	.88
Frustration	3.94	1.85
Guilt	1.40	1.00
Happiness	2.31	1.24
Hope	2.06	1.29
Interest	4.32	1.63
Joy	1.74	1.09
Love	1.18	.63
Nervousness	3.48	1.59
Pride	2.43	1.65
Relief	1.92	1.33
Sadness	1.17	.55
Shame	1.55	1.09
Surprise	2.05	1.29
Threat	1.82	1.31

Table 4

*Intercorrelations Between Time Insensitivity and Self-report Measures of Cognitive**Flexibility (N=65)*

Scale	Dialectic	Analytic	Rigidity	Need for Closure	Ego-Resiliency
Composite Time Insensitivity	-.04	-.21	-.67**	-.61**	.41**
Dialectic		.69**	.25*	-.02	.24
Analytic			.26*	.06	.06
Rigidity				.59**	-.23
Need for Closure					-.40**

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

Table 5

*Relations between Time Insensitivity, Cognitive Flexibility, and Stroop Condition**Performance (N=65)*

Self-Report Measure	Stroop Condition Latency ^a		
	<u>B</u>	<u>t</u>	<u>p</u>
Time Insensitivity**	-.22	-2.36	.02
Rigidity**	.20	2.1	.04
Need for Closure**	.19	1.96	.05
Dialectic Thought*	-.17	-1.75	.09
Resilience*	-.16	-1.71	.09
Analytical Thought	-.05	-.50	ns

Note. ^aAnalyses were performed separately and are controlling for baseline latency. * Marginally significant at 0.10 level. ** Significant at the 0.05 level.

Table 6

Correlations between Time Insensitivity and Self-report Measures of Emotion for the Word Guessing Task (N=65)

Emotion	Time Insensitivity	
	r	p
Amusement	.12	.33
Anger	-.17	.18
Anxiety	-.02	.89
Challenge	.15	.23
Contempt	-.12	.36
Contentment	-.12	.33
Disgust	-.06	.62
Disappointment	.10	.45
Eagerness	.03	.84
Embarrassment	-.10	.42
Enthusiasm	.02	.90
Fear	-.02	.88
Frustration	-.15	.23
Guilt	-.02	.86
Happiness	-.18	.16
Hope	.01	.96
Interest	.02	.87
Joy**	-.26	.04

Love	-.20	.12
Nervousness	-.05	.69
Pride	-.04	.77
Relief	-.18	.14
Sadness	-.18	.14
Shame	-.16	.20
Surprise	-.01	.96
Threat	-.16	.21

Note. * Correlation is marginally significant at the 0.10 level (2-tailed). ** Correlation is significant at the 0.05 level (2-tailed). *** Correlation is significant at the 0.01 level (2-tailed).

Table 7

Correlations between Time Insensitivity and Self-report Measures of Emotion for the Stroop Task (N=65)

Emotion	Time Insensitivity	
	r	p
Amusement	.10	.41
Anger	-.19	.12
Anxiety	-.09	.46
Challenge	.17	.17
Contempt	-.03	.818
Contentment	.01	.96
Disgust	.04	.73
Disappointment	.10	.42
Eagerness	.11	.38
Embarrassment	-.15	.24
Enthusiasm	.15	.23
Fear*	-.22	.08
Frustration	.09	.49
Guilt	.09	.47
Happiness	-.17	.18
Hope	.12	.34
Interest*	.21	.09
Joy	-.04	.73

Love*	.24	.06
Nervousness	-.01	.94
Pride	.10	.44
Relief	-.01	.93
Sadness	-.09	.49
Shame	-.03	.82
Surprise	-.15	.24
Threat**	-.28	.03

Note. * Correlation is marginally significant at the 0.10 level (2-tailed). ** Correlation is significant at the 0.05 level (2-tailed). *** Correlation is significant at the 0.01 level (2-tailed).

Endnotes

¹ The ethnic diversity of the samples reported in this study reflect the Introductory Psychology Subject Pool at Boston College, and thus include only small subsamples of ethnic minorities. As such, ethnic differences were explored by comparing European American students to non-European American students.