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The Effects Of Delay Of Gratification On The Academic Achievement, Substance Abuse, And Violent Behavior Of Middle-school Students In Alternative Learning Settings

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THE EFFECTS OF DELAY OF GRATIFICATION ON THE ACADEMIC ACHIEVEMENT, SUBSTANCE ABUSE, & VIOLENT BEHAVIOR OF MIDDLE-SCHOOL STUDENTS IN ALTERNATIVE LEARNING SETTINGS

by

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ABSTRACT

This study examined the effects of delay of gratification on academic success, substance abuse, and violent behavior. The participants in this study were chosen from an alternative learning school comprised of middle school students in Florida. The hypothesis for this study is as follows: Delay of gratification is negatively related to substance abuse and violent behavior, and positively related to academic achievement. The analysis of the data was conducted on the primary predictor variable (delay of gratification), alternate predictor variables (substance abuse & violent behavior) and the ultimate outcome variable (academic achievement) of this study. Initial statistical inquiry involved descriptive statistics (mean, standard deviation, kurtosis and skew) of the aforementioned variables, partial correlations (variable interrelationships), and the formulation of a multiple regression path analysis to investigate the particular paths individually within the proposed theoretical model (Wagner, 1993).

ACKNOWLEDGMENTS

To my parents for their eternal faith in me and unwavering effort on my behalf.

To my beloved Patti for always being there with patience and encouragement.

Anything I accomplish in my life is a result of being blessed by their love.

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CHAPTER 1: INTRODUCTION

Statement of the Problem

News headlines are filled with proclamations of underachievement and increasing dropout rates among American public school students (Thornburgh, 2006). According to Time Magazine in April 2006, over thirty percent of public high school students will quit school prior to graduation; for Latino and African Americans, that number increases to fifty percent. Even more startling is the recent surge in violent behavior and drug abuse among American children. In the United States, a recent national survey of school-based police officers indicates that school violence has increased dramatically (National Association of School Resource Officers, 2004). Further, half of all students today try an illicit drug by the time they finish high school (Johnston, O'Malley, Bachman, & Schulenberg, 2004). The blame for students failing in school has been wide-spread and ever-changing from the teachers to the textbooks to the class sizes and back again (Duckworth & Seligman, 2005). However, a potentially important and understudied possibility for this underachievement has recently emerged that could provide another variable behind these symptoms: the lack of desire of this generation of adolescent students to effectively delay gratification in terms of their academic performance (Duckworth and Seligman, 2005).

While the importance of analyzing the links between delay of gratification and academic performance becomes increasingly necessary, a far more insidious manifestation of gratification delay in our schools has emerged in need of urgent examination. The increased difficulty of many of this generation of students to control

their impulses has been directly linked to delinquent behavior that has become progressively destructive and deadly in terms of increased incidents of violence (Cherek, Moeller, Daugherty, & Rhoades, 1997; Dolan & Fullam, 2004; Tangney, Barlow, Wagner, et al., 1996; Tangney, Wagner, Barlow, Marschall, & Gramzow, 1996; Tangney, Wagner, Marschall, & Gramzow, 1991) and substance abuse (Ayduk, et al., 2000; Kirby, Petry, & Bickel, 1999; Richards, Zhang, Mitchell, & DeWit, 1999; Storey, 1999; Tangney, Baumeister, and Boone, 1994; Wagner, 1993; Wills, DuHamel, & Vaccaro, 1995). Such scenarios give rise to the realization that a student's inability to sufficiently delay gratification can be a gateway to a multitude of societal ills that permeate into our schools (Langenfeld, Milner, & Veljkov, 1997; Wulfert, Block, Santa Ana, Rodriguez, & Colsman, 2002).

I will examine this claim by investigating the following research question:

> Can delay of gratification be a viable and quantifiable variable in the search to better understand the proliferation of substance abuse, violent behavior and declining academic performance in today's youth?

Purpose of the Study

The purpose of this study is to investigate the ability of a sample population of middle and high school Florida students in alternative environments to delay gratification. A secondary purpose is to measure the impact of delay of gratification on the capacity of the sample population to control their impulses and resist immediate and often negative temptations (violence and substance abuse) in favor of academic success (academic achievement).

Significance of the Study for Theory

This study is theoretically significant because the correlations allow us to gain a stronger understanding as to the extent that gratification delay has on a student's overall capabilities to show impulse control in their decision making when confronted with negative temptations, both at home and school. The interrelationships between delay of gratification and additional variables such as academic achievement, student substance abuse, and adolescent violent behavior can be best illustrated in a theoretical path analysis model that represents the hypothesis while clarifying the connections between the predictor and outcome variables. The theoretical model displaying the relationships between the variables is depicted below. In this model, I claim that the relationship between delay of gratification and academic achievement is mediated by substance abuse and violent behavior. The interrelationships (shown in Figure *1*) will act as a template for the potential invalidation of the proposed hypotheses.

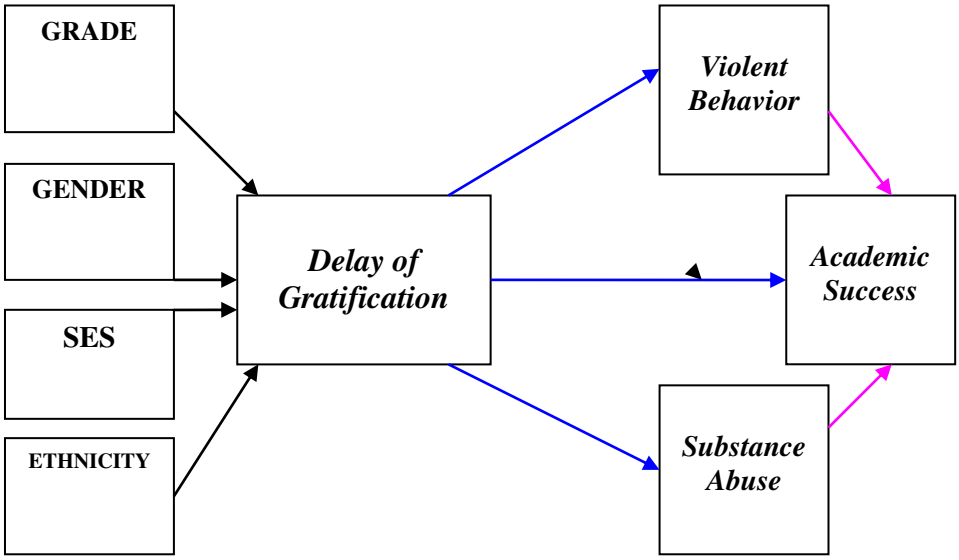


Figure 1: Theoretical model between delay of gratification and its interrelationships with the variables of substance abuse, violent behavior, and academic achievement.

Delay of Gratification and Substance Abuse

Studies involving delay of gratification and substance abuse have tested a wide variety of sample pools including college students (Kollins, 2003), gambling addicts (Petry, 2001), and even pregnant women that smoked cigarettes prior to pregnancy (Yoon, Higgins, Heil, Sugarbaker, Thomas, & Badger, 2007). This study will add a new type of sample population to the current body of information by investigating the relationship between delay of gratification and substance abuse with middle school children from alternative school environments.

Delay of Gratification and Violent Behavior

Very little research to date has been done connecting delay of gratification and violent behavior, in children or adults. One of the most current studies was conducted by Dolan and Fullam (2004), who examined 40 violent offenders from a male prison. This study will help to expand the present dearth of data regarding delay of gratification and violent behavior.

Delay of Gratification and Academic Achievement

The studies of Duckworth and Seligman (2005, 2006) are actually two of the most recent of the limited research analyzing the association between delay of gratification and academic achievement. Duckworth and Seligman showed a positive relationship between the two in a comparative study between the correlative strength of delay of gratification and IQ (intelligence quotient) related to academic achievement. For my study, I expect to find that delay of gratification will show a positive relationship with academic achievement as the principal outcome variable, but with one substantial difference: (a)

the works of Duckworth and Seligman are comparative studies, as opposed to this study's path analysis approach.

Significance of the Study for Practice

This study will attempt to answer the following question regarding practical significance:

1. Why is it important for educators to understand the relationship between delay of gratification and variables such as impulsivity, violent behavior, substance abuse, and academic achievement?

Gratification delay studies have become timely due to an escalating nation-wide emphasis on instant indulgence that has had an overwhelming influence on our adolescent students (Goldman, 1996). Today, children are over-stimulated with an exhaustingly intense bombardment of music, advertising, and peer pressure promoting the pleasures of instant gratification (Tangney et al., 2004; Rodriguez, Mischel, & Shoda, 1989). Life, however, is a dynamic process that requires effort and sometimes extreme struggle to find the proper solution to a myriad of problems that rarely offer immediate reward (Duckworth & Seligman, 2005). This is the paradox that our society has fostered; the result of which has evolved to the point that McClure (1986) warned, "our society's emphasis on instant gratification may mean that young students are unable to delay gratification long enough to achieve academic competence" (p. 20). Unfortunately, studies regarding delay of gratification have offered little in terms of solutions that can impact learning in school. This study will help to provide such possibilities.

CHAPTER 2: LITERATURE REVIEW

In this review of the literature, I will support the hypothesis of my study by presenting the integral research that will demonstrate how critical the act of delaying gratification is in terms of predicting student substance abuse, and violent and delinquent behavior. Such variables, along with the subsequent academic failure, are what ultimately lead to alternative school incarceration. I will first detail the role of alternative education in our schools on the federal and state level along with its growing importance in American public school education. Second, I will define delay of gratification and its relationship to impulsivity as it pertains to this study. Next, I will give an overview of the history of the research in the field of delay of gratification through a comprehensive review of the previous body of work in the field, while showcasing the proliferation of delay discounting as a method for assessing gratification delay. I will then present the pertinent case studies highlighting the relationships between delay of gratification and variables like substance abuse, violent behavior, and juvenile delinquency and how these relationships ultimately affect academic achievement. Finally, I will discuss the importance of causality in strengthening the integrity of the present study's future theoretical and practical implications.

Alternative Education

In this section, I will demonstrate how alternative education has become an escalating force in the American public school system. The importance of analyzing an alternative school population in this study is to discern whether delay of gratification is a

measurably significant factor in the manifestation of the type of negative behavior that is conducive to scholastic failure and confinement in an alternative facility.

Defining Alternative Education

Over the years, the term "alternative school" has taken assorted meanings. The definition of "alternative school", according to the central database of the U.S. Department of Education (USDOE, 2002), is a public K-12 school that has: a) met certain student requirements that could not otherwise be effectively accommodated; b) offered curriculum differing from the school district norm; c) acted as an extension of an existing public school; or d) existed outside the typical educational groupings of vocational, special and "regular" public schools. More specific configurations involving alternative schools have been established by Raywid (1994), Fitzsimons-Hughes, Baker, Criste, Huffty, Link, Piripavel, Roberts, Snipes, Valore, Ware, and Xander (2005), and Rix and Twining (2007).

This study will focus on the Type II schools described by Raywid (1994), Fitzsimons-Hughes et al. (2005), and Rix and Twining (2007), or what Florida Statutes call "second chance schools" Type II schools have been defined in comparable ways by multiple studies, but with some notable distinctions.

Raywid (1994):

> Schools that offer a final opportunity for delinquent or students involved in criminal activity to stay in their respective school systems in programs aimed primarily at modifying negative behavior and teaching rudimentary academics.

Fitzsimons-Hughes et al. (2005):

> Schools primarily aimed at short-term students with moderate to severe disciplinary issues. In many cases, such students are ordered by the court for mandatory participation.

Rix and Twining (2007):

> A short-term *last chance* setting for delinquent students located either within a specified classroom in each individual school or, in more extreme cases, to a separate learning facility within the school district to which these children are confined for disciplinary reasons.

According to Chapter 1003, Part V, Section 53 (titled *Public K-12 education - Specialized instruction for certain Public k-12 students - Dropout prevention and academic intervention*) of the 2009 Florida Statutes, the definition for "second chance schools" is much more specifically construed at the state level (Florida Senate, 2009):

> (d)1. District school board programs provided through cooperative agreements between the Department of Juvenile Justice, private providers, state or local law enforcement agencies, or other state agencies for students who have been disruptive or violent or who have committed serious offenses. As partnership programs, second chance schools are eligible for waivers by the Commissioner of Education from State Board of Education rules that prevent the provision of appropriate educational services to violent, severely disruptive, or delinquent students in small nontraditional settings or in court-adjudicated settings. (p. 1)

For a pupil that is assigned to a "second chance school" in the state of Florida from grades 6 – 10, the following conditions must be met (Florida Senate, 2009):

> 1. The student is a habitual truant.

2. The student's excessive absences have detrimentally affected the student's academic progress and the student may have unique needs that a traditional school setting may not meet.

3. The student's high incidences of truancy have been directly linked to a lack of motivation.

4. The student has been identified as at risk of dropping out of school.

5. A student who is habitually truant may be assigned to a second chance school only if the case staffing committee determines that such placement could be beneficial to the student and the criteria included in subparagraph 3 is met.

A child in Florida can be relocated to a second chance school when there is an available second chance school within the local school district and one of the subsequent conditions has been met (Florida Senate, 2009):

1. The student habitually exhibits disruptive behavior in violation of the code of student conduct adopted by the district school board.

2. The student interferes with the student's own learning or the educational process of others and requires attention and assistance beyond that which the traditional program can provide, or, while the student is under the jurisdiction of the school either in or out of the classroom, frequent conflicts of a disruptive nature occur.

3. The student has committed a serious offense which warrants suspension or expulsion from school according to the district school board's code of student conduct. For the purposes of this program, "serious offense" is behavior which:

(a) threatens the general welfare of students or others with whom the student comes into contact; (b) includes violence; (c) includes possession of weapons or drugs; or (d) is harassment or verbal abuse of school personnel or other students.

Defining alternative education both on a federal and state level is critically relevant to this study. Understanding exactly what an alternative school is and what constitutes a student being enrolled in one is vital in ultimately explaining the role of delay of gratification as a significant factor in their delinquent activity.

The Growing Need for Alternative Schools

The type of alternative education that exists today originated over forty years ago as public schools attempted to look for new ways to educate a new America that emerged from the sweeping societal changes that exemplified the 1960's. This was an obvious response to the growing feeling of isolationism and establishment control that pervaded the public schools of that era (Quinn, Poirier, Fuller, Gable, & Tonelson, 2006; McKee & Connor, 2007). At that time, alternative schools were developed in two distinctive ways based on differing priorities based mainly on geographic location (Raywid, 1998): a) the cities - where alternative education centered primarily on low socio-economic and low achieving minority students; and b) the suburbs - where alternative education meant devising creative new methods of education that would depart from the status quo.

Although alternative schools generally lacked a prevailing single definition and have had obvious philosophical divisions regarding its institutions, the necessity for alternative schools as learning centers for delinquent at-risk teenagers escalated measurably during the last forty years (Kenney & Watson, 1999; Loy & Gregory, 2002; Quinn, Poirier, Fuller, Gable, & Tonelson, 2006; McKee & Connor, 2007). In the 1950's,

the major complaints expressed by public classroom teachers pertained to incidental acts like being tardy, kids chewing gum, or talking too much (Kenney & Watson, 1999). By the 1990's, a more fearful and dangerous message was conveyed by teachers nationwide – that crime was rampant on campus in the form of drugs, brutality, weapons, and vandalism (Kenney & Watson, 1999). According to research reports regarding alternative schools like the study created by the University of Minnesota and funded by the USDOE (Lehr, Moreau, Lange, & Lanners, 2004), less than 500 alternative schools were reported nationally in 1973 (Stuart, 1993) as compared to over 3,800 in 1997-1998 (Hoffman, 2001), with almost 1,400 of those schools aimed at delinquent students in fear of academic failure (Grumbaum et al., 2000). The trend continued to the 2000-01 school year when almost 11,000 alternative schools were reported by the most recent NCES statistical analysis report (U.S. Department of Education [USDOE] - National Center for Education Statistics [NCES], 2002). Estimates for 2009 could exceed 20,000 alternative schools in the United States.

In the last two decades in particular, a disturbing rise in deviant school activity and at-risk student dropout rates had been combined with the growing fear that delinquents could be running free in neighborhoods instead of sitting securely and secured in their classrooms (USDOE – NCES, 2002; Hughes-Hassell, 2008). A public policy report issued in the fall of 2000 by the Ewing Marion Kauffman Foundation in alliance with the U.S. Department of Education found that 65% of teenagers came home from schools to empty houses because their parents were working, making the after-school hours the primary time zone for delinquent juvenile behavior like drugs, violence and other criminal activity to be performed (Ewing Marion Kauffman Foundation, 2000;

National Safety School Center [NSSC] statistics, 2006). In fact, most of these teenagers have no adult supervision whatsoever (Kopka, 1997). According to Day (1996), these unsupervised children are being raised by their peers and the negative influence of their peers is more deadly and pervasive than if the "latchkey" children had similarly negative adult role models.

In a national study in 2000, a staggering 75% of adolescent male students and more than 60% of adolescent female students reportedly resorted to physical violence within the most recent year simply due to losing their tempers, while 69% of the teenagers stated that they had access to drugs whenever they wanted them (Josephson Institute of Ethics [JIE], 2001). A 1993 survey from The American Association of University Women (AAUW) disclosed that 85% of adolescent girls and over 75% of adolescent boys have encountered some form of sexual harassment in the classroom or from a classmate (National Association of State Boards of Education [NASBE], 1994). This dramatic increase in the incidents of adolescent criminal activity, particularly in the classroom, necessitated a greater police presence and heightened juvenile justice involvement in schools across the country (Lehr, Moreau, Lange, & Lanners, 2004), while also setting off a backlash of anti-crime legislation and federal projects aimed at making the schools safer like *the Gun-Free Schools Act of 1994* and the *1994 National Association of State Boards of Education (NASBE) Report on Violence and its Impact on Schools and Learning* (Kleiner et al., 2002; Van Acker, 2007). According to the NCES 2000-2001 statistical analysis report (USDOE - NCES, 2002), open collaboration with the juvenile justice system grew to 84% of existing schools by the year 2000, while police involvement climbed to 70%. In separate four-year spans, the percentage of

schools safeguarding their buildings from crime with locked doors escalated from 38% to a majority 53% from 1999 to 2003 (National School Safety Center [NSSC], 2006; U.S. Department of Justice [USDOJ] – Bureau of Justice Statistics[BJS] & USDOE - NCES, 2005), while the proportion of schools that employed cameras for security reasons surged from 39% in 2001 to almost 60% in 2005 (NSSC, 2006; USDOJ – BJS & USDOE - NCES, 2006). In addition, 90% of schools reported expanded use of hallway staff supervision and 68% of schools revealed a dramatic increase in the in-school utilization of police and security guards (NSSC, 2006; USDOJ – BJS & USDOE - NCES, 2006).

The strengthening of in-school security, however, was not by itself an effective solution to the ever-mounting level of delinquent activity in our schools. The role of the alternative school as a center focused on re-educating anti-social, often felonious at-risk teenagers was to be expanded to almost 50% of the secondary school districts nationally (Quinn et al., 2006; USDOE – NCES, 2002). Unfortunately, negative statistics like the following regarding the students of alternative schools have legitimized the need for such a drastically urgent response. Multiple studies have shown a substantially greater likelihood of drug abuse and acts of violence in children that were placed in alternative schools as compared to those who remained a part of the regular school system (Center for Disease Control and Prevention [CDC], 1994; Grumbaum & Basen-Enquist, 1993; Weller, Tortolero, Kelder, Grumbaum, Carvajal, & Gingiss, 1999). Additional findings from the 1998 United States National High School Youth Risk Behavior Survey further corroborated the alarming extent of criminal behavior found in the students assigned to our nation's alternative schools (Grumbaum & Kann et al., 2000):

1. Drug abuse – The percentage of teenage students in alternative schools who have used marijuana swelled to over *eighty-five percent*, with 53% using within one month of the survey. Over 36% have used cocaine, with almost two-thirds of them also having experimented with the "crack" form of the drug. Nearly *half* of the students have used other illegal substances such as Ecstasy, PCP, LSD, amphetamines, or heroin, with almost 30% using household products such as paint or glue as an inhalant. Finally, almost *forty percent* of alternative students had had access to drugs *on school grounds* within one month of the survey.
2. Violence – Almost *sixty percent* of the alternative students across the country had been in a fight within one year of the survey, with nearly *one quarter* of those happening *at school*. 20% of these teenagers had no issue whatsoever with *shooting* anyone who had taken anything from them for *any* reason (Day, 1996).

Today, while in-school security enforcement nation-wide has greatly improved, the rapid advancement of delinquent and violent behavior in our youth inside and outside the classroom continues to be a critical concern moving forward in American education, manifesting itself in the necessary proliferation of alternative learning centers (Coyl, Dick, & Jones, 2004). In this section, the escalation of alternative education programs in our American public school system was examined along with an explanation of what constitutes a student being detained in an alternative education program on the state and federal level.

Defining Delay of Gratification

The definition of delay of gratification is a person's proficiency in controlling their individual responses to external influences in achievement of a personal goal (Mischel, 1981; Strayhorn 2002). In academic terms, it is when a student can see past all the day-to-day temptations that can obstruct the level of focus necessary to achieve long-term goals in the classroom like creating the body of knowledge and work in a scholastic career that, in time, leads to the attainment of a quality grade point average and ultimately graduation (Bembenutty & Karabenick, 1998a). Defining delay of gratification in scientific terms, however, has been an issue of lengthy and on-going deliberation for over fifty years (Wulfert et al., 2002).

Delay of gratification has been defined in psychological circles in two central and distinct ideologies (Bembenutty & Karabenick, 1998a): (a) an ability, skill, or aptitude that can be cultivated through specific use of cognitive and/or motivational strategies over time (Mischel, Shoda, & Peake, 1988); or (b) an unconscious product of one's behavior, innate personality, and inherent impulsivity (Funder, Block, & Block, 1989).

Essential to the understanding of delay of gratification is an awareness of the distinctions drawn between delay of gratification and impulsivity. The connection between the impulse control of students and its result on gratification delay has been an area of intense debate for years (Humphrey, 1982; Mischel & Metcalfe, 1999; Mischel, Shoda & Peake, 1998, 2000). Various frameworks have been hypothesized to examine impulse control as it relates to delay of gratification. Mischel and Metcalfe (1999) proposed a collaboration of two polar approaches to solve this dilemma: a "hot", impulse-driven process that interacts with a "cool", cognition-driven system to

simultaneously facilitate and debilitate the self-control necessary for an individual to successfully reject the allure of instant gratification to fulfill their predetermined goals. The "hot" method (Mischel & Metcalfe) is one where decisions are made quickly, emotionally, and impulsively, without much extraneous thought. Impulse control is steered by the immediate stimuli of an attractive alternative to the original goal path. The "hot" process (Mischel & Metcalfe) is exacerbated by stress, and "hot" responses are triggered conditionally and unconditionally, while the "cool" portion is based on slow measured thought, contemplation, reflection, controlled decision making, and a deliberate plan for goal attainment. In short, Mischel & Metcalfe proposed that higher levels of impulsivity or "hot" responses meant a lesser likelihood of delaying gratification while decreases in impulsive behavior or "cold" responses meant a greater degree of gratification delay.

Some scientists have considered delay of gratification to be an outgrowth of impulsivity (Gottfredson & Hirschi, 2000; Mischel & Metcalfe, 1999; Strayhorn, 2002), while most have considered them interchangeable (Bembenutty & Karabenick, 1998a; Callaway, Lutes, & Schlatter, 2007; Coffey et al., 2003; Dolan & Fullam, 2004; White et al., 1994) when comparing them to variables like substance abuse, violent behavior, delinquency, and academic achievement. Other analogous terms include self-control (Akers, 1991; Humphrey, 1982), self-regulation (Ayduk, Mendoza-Denton, Mischel, Downey, Peake, & Rodriguez, 2000; Miller & Byrnes, 2001), impulseness (Barratt, 1994; Eysenck, Easting, & Pearson, 1984), impulsive choice (Perry, Nelson, & Carroll, 2008), and even gratification control (Langenfeld, 1997). For the sake of this study, the terms

delay of gratification and impulsivity, as well as any of the aforementioned analogous terms, will be recognized as interchangeable and consolidated into a single variable.

Overview of the History of Research on Delay of Gratification

The study of delay of gratification originated to help psychologists to better understand the varying stages of child development as they related to age (Duckworth & Kern, 2011). Impulse control in terms of delay was a pivotal aspect of Freud's (1922) analysis of ego development. Early efforts to quantify delay of gratification included Rorschach testing (Singer, 1955), but such methods proved inferior in terms of validity and reliability. Such work led to the pioneering studies in the field of delay of gratification by Mischel (e.g., 1958, 1961, 1966, 1974).

Mischel initially considered delay of gratification to be an aptitude or skill set that could be enhanced through teaching strategies specific to gratification delay (Mischel & Baker, 1975; Rodriguez, Mischel, & Shoda, 1989). Mischel held that the success of a child to defer gratification hinges on cognitive competence, meta-cognitive intuitiveness, and personal discipline, which are qualities that can be developed through proper training (Mischel, Shoda, & Peake, 1988).

In his introductory analysis on gratification delay (1958), Mischel presented his elementary school participants from Trinidad with a choice: a lesser, immediate prize of a one-cent piece of candy or the greater reward of a substantially larger ten-cent piece of candy if they wait for a predetermined period of time. In the 1960s and early 1970's, Mischel conducted replications of his Trinidad experiments at Stanford University with American preschoolers using a variety of rewards ranging from candy bars to pretzels to

peanuts to even monetary awards (Mischel; 1961, 1966; Mischel & Mentzer, 1962; Mischel & Ebbesen, 1970; Mischel, Ebbesen, & Weiss, 1972; Mischel & Moore, 1973; Mischel & Underwood, 1974; Mischel & Baker, 1975; Moore, B., Mischel, W., & Zeiss, A., 1976).

Mischel and his collaborators (Ayduk, 2002; Ayduk et al., 2000; Metcalfe, 1999; Rodriguez & Shoda, 1989; Shoda & Peake, 1988, 1990) continued his expansion of the definition of delay of gratification through the development of CAPS (Cognitive-Affective Personality System theory – Mischel & Shoda, 1995). With the CAPS theory, Mischel & Shoda (1995) illustrated the processes people use to cope with their daily surroundings. The 1995 discussion isolated several questions: (a) how successful do people expect to be, (b) what are their core values, (c) what are their short and long term goals, (d) what are their unique skill sets, (e) what is their level of self-discipline, and (f) how do all the aforementioned questions affect where they feel *they fit* into their environment. These questions were examined with a new generation of children from Trinidad, as Mischel (1996) discovered that among children who had negative expectations of success due to the social environment in which they lived, they neither had the desire or determination to effectively delay gratification.

Mischel was also responsible for the delineation of goal choice and goal control in the delay process (Mischel, 1974; Bembenutty & Karabenick, 2004). Goal choice is a product of an individual's expectations, their frame of experiential reference, and their trust issues (Ayduk et al, 2000), while goal control involves sustaining the energy and motivation needed to ultimately achieve the chosen goal. Goal control, according to

Mischel and Shoda (1995), utilizes methods of cognition to navigate through the temptations that can keep the individual from their goal destination.

Over the years, Mischel shifted his ideological beliefs of gratification delay, changing from a strictly cognitive "cool" viewpoint to one that included an emotionally impulsive "hot" counterpart (Mischel & Metcalfe, 1999). Mischel & Metcalfe delivered this aforementioned theory as an explanation of the interaction between these two distinct models as processes that aid or hinder "willpower" in terms of delay of gratification.

Another school of thought was put forth by Funder, Block and Block (1983; Funder & Block, 1989), who related delay of gratification to personality traits like responsibility, productivity, social perceptiveness, insightfulness, and personal ethics. Funder & Block (1989) argued that any definition of gratification delay that would be relevant to everyday life must contain the following focus points: (a) the importance of the motivational intensity of the child towards immediate gratification, and how they deal with that impulse, and (b) the student's goals and their plan to achieve them.

Once defined, Funder & Block (1989) postulated that gratification deferral could be evaluated using three distinct techniques: (a) an extensive reward system with incremental growth in reward value that would correspond to increasing levels of gratification delay; (b) the use of highly-tempting rewards that are easily accessible, but with no true benefit to be earned through the achievement of greater degrees of gratification deferral; and (c) a combination of *both* models.

With a sample group of 104 fourteen-year olds, Funder & Block (1989) conducted six separate examinations. Each analysis concluded with a decision for each young participant: (a) to accept a predetermined payment for taking part in that respective

session, or (b) defer the fee until the final session, at which time considerable interest will have accrued. In the study, 83 of the 104 students (80%) delayed gratification for the entire number of sessions.

More questions were asked in the study of Krueger, Caspi, Moffitt, White and Stouthamer-Loeber (1996), specifically: (a) what is the correlation between gratification deferral and psychopathology, and (b) what is the correlation between gratification delay and internalizing and externalizing disorders? The study (Krueger et al., 1996) assessed a group of 428 twelve and thirteen-year-olds that were identified as either "at-risk" or "not-at-risk" for aberrant behavior that extended to criminal involvement. The children in the study (Krueger et al) were placed in the two groups based on interviews with the participating student and their guardian, as well as the completion of a behavioral survey of the child by a teacher close to the child. These two groups were then split by Krueger et al. into four groups based on whether the guardian (and secondly the teacher) thought the child had internalizing or externalizing disorders. Krueger et al. (1996) discovered that:

1. Low levels of delay of gratification presented themselves as a specific risk factor of externalizing disorders (i.e., actions that are combative and disruptive), and *not* a general risk factor for delinquent or aberrant behavior. Significant results were calculated with the use of one way ANOVAS for the teacher-designated groups and parent-designated groups.
2. Several statistically significant positive correlates in the study predicted successful delay of gratification (e.g., traits like consciousness, creativity, focus),

while negative correlates in the study (e.g. traits like immaturity and selfishness) predicted an inverse relationship.

Alternative theories involving delay of gratification included the studies of Snow et al. (1996) and Metcalfe & Mischel (1999). Snow and his colleagues (1996) hypothesized that gratification delay had a direct correlation to a child's volitional discipline and the different strategies that can enhance a child's ability to delay gratification, while Metcalfe & Mischel (1999) and Bembenutty (1999) found evidence that the level of gratification deferral is specific to its domain (i.e. academic versus work environments).

The chief limitations in studies like Mischel's, as in several others that will follow in this review, are found in their difficulty to easily translate the results from the hypothetical to something actual and substantive. These limitations are classified as: a) the extrapolation of something small, visible, immediate and tangible like a marshmallow into something far less tangible and much less immediately visible like a final course grade; and (b) the extrapolation of a few minutes of a delay procedure in a study into something that could take months or years in real time like graduating from school (Wulfert, Block, Santa Ana, Rodriguez, & Colsman, 2002). As a result of these limitations, self-reports in a questionnaire format have become a common alternative, although they include issues of their own according to Wulfert et al. (e.g. the influence of peer pressure on both the study participant's level of interest in participating in the study process, and whether the participant was more worried about test taking expediency rather than truthfulness.)

The value of the body of work in this section to my particular study could be answered with two if-then statements: (a) if the act of delaying gratification is a skill that can be cultivated, then strategies can be brought into our schools to elevate the level of that particular skill set (Mischel & Mischel, 1983; Bembenutty & Karabenick, 1998a); however, (b) if delay of gratification is simply a form of impulsivity, then the solution would require strategies beyond the normal classroom settings (Funder, Block, & Block, 1989; Green & Myerson, 2004). Such strategies would involve behavioral and psychological assistance to aid these children, like those with Attention Deficit Hypersensitivity Disorder (ADHD).

The Proliferation of Delay-Discounting in the Assessment of Gratification Delay

Gratification delay has often been measured through the use of rewards. The process is known as *delay-discounting*, which is similar to the methods utilized in the aforementioned Mischel (1958, 1961, 1966, 1974) and Funder and Block (1983, 1989) studies, in that it decreases the current value of a future benefit as the amount of time it takes to receive the benefit is increased (Kirby, Winston, & Santiesteban, 2002). According to Kirby et al., the greater the rate of the discount, the more the student placed a diminishing value on future benefits, with a *zero* rate of discount equating to a complete indifference to delay, regardless of the total amount of time. The significance of discount rates in measuring gratification delay lies in the proven effectiveness of measuring an individual's ability to forsake an immediate gift of money for a larger gift in the future in an isolated experiment and how positively it correlates to that same individual's ability to

forsake instant gratification for the sake of future gain in a real world environment, in this case - academics (Kirby et al, 2002).

In the Wulfert et al. (2002) study, a group of 69 high-school students were given the choice of an immediate $7 reward or resisting the temptation and waiting for a $10 reward in one week. The dollar amounts were not selected arbitrarily, but were the result of a pretest by Wulfert and her colleagues that determined that at least 70% of the delayed reinforcer must be met for the response to be a measurable one. Of the participating population, Wulfert et al. separated the groups into "problem students" and "non-problem students" (p. 536), based on their in-school behavioral files. The scholastic achievement portion of this particular study created by Wulfert and her associates was contingent on the use of student records (specifically pupil grade point average). Wulfert et al. found that GPA and delay of gratification (in terms of impulsiveness) were negatively correlated. Equally significant univariate results were exhibited when comparing GPA and gratification delay.

The second study of Wulfert et al. (2004) was a replication of the previous one, using 48 middle school students, with 24 of those categorized as "problem students" (p. 542). The findings of the correlation and discriminant testing produced further significant results between GPA and delay of gratification.

Kirby et al. (2002) performed a nearly identical study to that of Wulfert et al. (2002) with college undergraduates instead of secondary students, employing the identical hypothesis along with a near duplication of the independent variable, money, and the dependent variable, grade point average (GPA). The results of the experiment by Kirby et al. substantiated the previous findings by Wulfert et al. by revealing a highly

significant negative correlation (over 4% of the variance) between discount rates and student GPA.

Different rewards can have different effects on the outcomes of delay discounting studies. Silva and Gross (2004) administered an experiment that resembled the studies of Wulfert et al. (2002) and Kirby et al. (2002) using a similar population (college students). The Silva and Gross study, in addition to a study utilizing financial rewards, included the more academically relevant reward of extra-credit work as an independent variable option in contrast to the initial independent variable of money. The two studies reveal similar results. Students in the first study who had better grades prior to the study discounted the immediate financial rewards much more than their lower-scoring peers. In the second study, it was revealed that the higher-scoring students discounted the long-term reward of extra-credit work *less* than the lower-scoring students that could have really benefited from its use (Silva & Gross).

The increase of experiments involving the theory of discounting (Green & Myerson, 2004) in academics has led to a difference of opinions regarding its true effectiveness. A growing number of scientists have maintained that the use of discounting as a tool for choice in recent studies is a consolidating factor in uniting a variety of psychological concerns (Green & Myerson). Discount rates have shown significant success in demonstrating the relationship between how well an individual controls their impulses in the pursuit of long-term rewards in the face of immediate gratification, particularly in the topics specific to this study like drug abuse, violent behavior, and academic failure (Cherek, D., Moeller, F., Dougherty, D., & Rhoades, H., 1997; Kirby, K., Petry, N.., & Bickel, W., 1999; Kirby, Winston, and Santiesteban, 2002).

However, previous research, like the aforementioned studies in delay of gratification, is limited, according to psychologists like Bembenutty and Karabenick (2004) and Funder and Block (1989); specifically in the common practice of utilizing a variety of rewards as decision-making tools that have failed to fully encapsulate the challenges faced by our children in academic settings. Within a school environment, Bembenutty and Karabenick argued that rewards would have a decidedly different cognitive value than the rewards employed in a non-academic surrounding (e.g. getting a good grade on a test versus receiving an extra marshmallow), while Funder and Block (1989) questioned whether the minimal gifts offered as incentives in such studies came close to replicating the intensely powerful temptations that school-age children are faced with on a daily basis.

Further limitations in using discounting arise when rewards received within a given study vary in more than one direction (Green & Myerson, 2004), whether it is: (a) the time that the reward is delayed; (b) the probability that it will be delayed; or (c) the dollar amount or value, whether intrinsic or extrinsic, of the reward. In recent studies, the distinction between the deliberate and delayed manner of the discounting of rewards as opposed to a probabilistic method has shown to be significant enough to call into question the legitimacy of using only a temporal delay-discounting approach (Green & Myerson).

Another limitation is the inherent lack of certainty in predicting individual preferences. One would assume that students would choose the certainty of an immediate payment rather than a delayed one, or a bigger prize over a smaller one, but future research will have to incorporate theoretical frameworks of discounting that involve

multi-dimensional solutions, rather than solely isolated outcomes (Green & Myerson, 2004).

With the outcome variable in my particular study as academic achievement, the importance of the studies in this section were in finding whether a given mode of analysis like discounting when used to study gratification delay is indeed transferable from the theoretical to an actual classroom setting. Clearly, future experimentation utilizing discounting as an instrument would be well served to use both probabilistic as well as temporal methods of discounting in uncovering issues that are of both a cognitive and behavioral nature (Green & Myerson, 2004).

The Relationship between Delay of Gratification and Academic Achievement

The rewards that come from scholarly success are normally distant and, in many instances for today's students, frustratingly so. In a world that increasingly values immediacy, the effort and time that a quality education requires is becoming increasingly difficult for students of all ages. Kirby, Winston, and Santiesteban (2002) found that "the ability to predict scholastic performance in adolescence based on delay of gratification in preschool is the best evidence to date that the ability to delay gratification is an intertemporally stable attribute of the individual" (p. 9).

Bembenutty (1999, 2007, 2009a, 2009b, 2009c; Bembenutty and Karabenick 1998a, 1998b, 2004) has done the most extensive work in the last fifteen years in the area of academic gratification deferral. In their 1998a study, Bembenutty and Karabenick (1998a, 1998b) developed and tested a form of self-assessment as a tool to analyze gratification delay in the classroom. Their analysis with the use of the survey

(Bembenutty et al., 1998a), known as the Academic Delay of Gratification Scale (ADOGS), resulted in significant correlations between variables like delay of gratification, methods of learning, and motivation in academic settings. The self-report (1998a) was created to examine gratification deferral as it pertained to a particular course rather than a generic personality characteristic. The instrument (1998a) presented an immediate reward and a more desirable delayed reward that resembled the aforementioned studies in the gratification delay field, however, non-academic alternatives were used in combination with academic incentives instead of monetary ones (e.g. "Would you go to a party instead of study for an important exam?").

In the 1998a study, Bembenutty and Karabenick concluded that ADOGS significantly predicted the participants' final course grades, both predicted and actual, as well as the level of their focus in terms of time and effort generated. The results of their study indicated that students that favor deferring gratification are more likely to do a better job of time management and working through obstacles to obtain their academic goals.

Bembenutty and Karabenick (1998a & 1998b) concluded that motivational determinants were a primary factor in gratification delay (i.e., goal importance). The results of the 1998b study, using a sample population of 196 undergraduates with their recently developed ADOGS (1998a) scale, indicated the participating students deemed the academic delayed option both more academically worthwhile and a more probable aid to future academic achievement. A student's motivation to be successful, along with the importance they place on the task at hand and the ultimate goal to be achieved, are related

to gratification delay as well as other variables, such as task value, expectancy, relevancy, goal orientation, and self efficacy (Bembenutty & Karabenick, 1998b).

An example of expectancy value being used as a function of delay of gratification could be found in the case of a middle school pupil who has been invited to a birthday get-together with his friends the night before he/she is scheduled to take an important test that he/she still must study for (Bembenutty & Karabenick, 1998b). In the scope of expectancy value, Bembenutty and Karabenick gave the student a choice between completing what was originally intended versus the possibility of choosing a potentially more tempting alternative. A decision between the two options is made, based specifically on the level of scholastic success a given child previously enjoyed, currently values, and ultimately expects (Bembenutty & Karabenick). Their study displayed strong correlations (ranging from .29 to .60 with $p < .001$) between gratification delay and the level of academic expectation of the student, the degree of interest in the subject, and the value that the student placed on their scholastic success.

Bembenutty (1999) expanded on this research with a study testing the relationships between academic gratification delay and three levels of goal orientation: (a) task, (b) performance-approach, and (c) performance avoidance. Bembenutty examined these three clusters with a sample of 102 college undergraduate students. The participants in Cluster 1 were students with a high degree of task-goal orientation, while the participants in Cluster 2 were students with a high degree of both task-goal orientation and performance-approach goal orientation (Bembenutty). The final group, Cluster 3, involved students with a low level of task-goal orientation, as well as low levels of performance-approach and performance-avoidance goal orientation

(Bembenutty). In comparing the study's three goal orientations, Bembenutty found significant findings in several categories: (a) the high-task participants in Cluster 1 exhibited stronger task focus, increased usage of motivational strategies, and lower levels of both performance-avoidance and performance-approach goal orientation than their high task- high performance-approach counterparts in Cluster 2; and (b) the students of Cluster 3 (who demonstrated previously low responses in terms of all the orientations) reported a measurable lack of desire to delay gratification, along with displaying greater interest in the alternate non-delay options and considerable disinterest in the consequences that such actions would bring (Bembenutty).

The teams of Hogan & Weiss (1974); Wolfe and Johnson (1995); Mansfield, Pinto, Parente, and Wortman (2004); Tangney, Baumeister, and Boone (2004), and Spinella and Miley (2003) also linked academic performance to self-control with college and university students as subjects. Specifically, cognitive self-control is a student's capacity to solve problems and self-supervise this process on an ongoing basis (Humphrey, 1982).

Hogan and Weiss (1974) employed as participants a group of John Hopkins undergraduates elected to Phi Beta Kappa, the most elite honorary society of any American university. This sample population was compared to a similarly talented but more underachieving group of students from John Hopkins and Lehigh University, as well as a third group of students of average academic standing from the same two schools. Hogan & Weiss found a strong statistical correlation between the three levels of student achievement and the three coinciding levels of self-control as found through the use of the California Psychological Inventory (CPI), considered a highly successful

predictor of scholastic success for its time. Predicting academic achievement is the basis of my study, and the Hogan and Weiss study is one of the first of several such studies that focus on that very issue as it correlates to a student's impulse control.

Wolfe and Johnson (1995) compared delay of gratification to 31 different personality traits (e.g. risk-taking, responsibility, tolerance) to see which variable most influenced academic performance in comparison to SAT scores. A population of over 200 college students was examined, multiple regression analyses were run, and gratification delay (i.e. self-control) was the sole variable of the 32 that proved to be more powerful than SAT scores in predicting academic success (Wolfe & Johnson, 1995). Wolfe and Johnson (1995) found that deferring gratification (i.e. self-control) accounted for 9% of the variance in the study as opposed to 5% for SAT scores. The Wolfe and Johnson study supports my research hypothesis regarding the positive relationship between gratification delay (self-control) and academic achievement.

Mansfield et al. (2004) used a sample size of 164 college undergraduates divided into two groups: a) top-level scholars (with GPAs $\geq$ 3.3) and b) lower level scholars (with GPAs > 2.9). Mansfield and her colleagues discovered a measurable disparity between the two groups and the students' abilities to control their impulses as they pertained to their academic performance, which parallels the primary premise of my study.

Tangney, Baumeister, and Boone (2004) studied gratification deferral in university students as a behavioral indicator of self-control, testing a new instrument (Tangney Self-Control Scale [SCS]) that, like the ADOGS by Bembenutty and Karabenick (1998a), was created specifically for such an analysis. This study (Tangney et al., 2004) demonstrated a positive correlation between high levels of self-control (i.e. low

levels of impulsivity) and grade point average using the SCS, showing strong empirical data corroborating the basis of my hypothesis. In fact, Tangney et al. felt that, given the results, that controlling one's impulses could be at the center of making necessary adjustments in life, and not the least of which is delaying gratification and achieving classroom success.

Spinella and Miley (2003) investigated impulsivity in 27 undergraduate psychology college students and its relationship to academic achievement. The Spinella & Miley study used the Barratt Impulsiveness Scale (BIS-11 [Barratt, 1994]), a self-rating scale with 30 questions directly assessing several elements of impulsivity (non-planning, motor, and cognitive). A significant inverse relationship was found by Spinella and Miley between all of the examined areas of impulsivity (non-planning, motor, and cognitive) and academic performance (exam scores and final grades). The results of the Spinella and Miley study showed clearly how cognitive methods of teaching could bring out measurable gains in impulse control, leading to stronger scholastic performance.

Further examples of studies focusing on delay of gratification in terms of academic achievement can be found in the studies of Kurdek and Sinclair (2000), Duckworth & Seligman (2005), and Langenfeld (1997).

Kurdek and Sinclair (2000) used elementary school children as a population like Mischel (1958 and others), sampling 283 fourth and fifth graders and finding that cognitive self-control was statistically predictive of success in reading and mathematics and underscored the importance of simple control elements in academic performance like task focus and adherence to a disciplined routine. These control elements directly align

with Goleman's (1995) definition of delay of gratification, which is "the ability to deny impulse in the service of a goal" (p. 83).

Duckworth and Seligman (2005) studied delay of gratification versus intelligence quotient (IQ) as a predictor of academic success in a magnet school of fifth-graders. With the use of multiple self control ratings and the application of the Kirby Delay-Discounting Rate Monetary Choice Questionnaire (Kirby, Petry, & Bickel, 1999) in combination with various measures of academic achievement (student grades, classroom attendance, equivalency tests, and magnet school committee selection based on potential performance), Duckworth and Seligman concluded that children that successfully delayed gratification out-achieved their peers with higher IQs when measuring school grades, standardized tests, and attendance records. With multiple regression analysis utilizing IQ, achievement test scores, and self control ratings as predictor variables and final grades as the dependent variable, the findings proved significant once the composite measure was put into place to enhance validity and decrease multicollinearity (Seligman and Duckworth, 2005).

Langenfeld (1997) examined the effect of gratification control on the in-school conduct of two groups of children; one with preschool students, and one with students in grades three, four and five. The studies used life situations based on what would be suitable for the age of the child to test how strongly the students could delay gratification to receive a reward. Significant relationships were found between delay of gratification and the students' social skills, verbal, and non-verbal skills in the preschool group. Similar significant findings were found for the third, fourth and fifth grade groups. The results of the Langenfeld study can help educators determine the optimal time in a child's

development that gratification delay should be taught. The Langenfeld study, as well as the other studies in this section, supports the positive association that my study proposes between gratification delay and academic accomplishment.

Unfortunately, the most up-to-date studies (Rutherford, DuPaul, Jitendra, 2008; Thorell, 2007; Diamantopoulou, Rydell, & Thorell, 2007) predominantly examine impulsivity in scholastic settings from a strictly behavioral framework (e.g. ADHD (attention deficit / hyperactivity disorder) rather than balancing the analyses with any cognitive option, like strategies that can affect change.

Taken together, the research referenced in this section on delay of gratification and academic achievement is vital to my particular study because of the importance of taking what we have learned from these theoretical examinations and applied them to practical classroom applications that can improve a student's aptitude for delaying gratification (Kirby et al, 2002). Previously, there was minimal empirical data showing relevancy between such tests and any real-life application (Rodriguez et al., 1989). Further research can lead to a curriculum created by educators specifically to strengthen the levels of gratification delay in their student population through strategies focusing on goal awareness, goal consequences, in combination with motivation and self-efficacy enhancement (Bembenutty, 1999; Bembenutty & Karabenick, 2004).

Delay of Gratification, Substance Abuse, and Violent and Delinquent Behavior

Delay of gratification signifies a modicum of self-control and the capacity to resist, at least temporarily, the immediate temptation of something that may divert us from our predetermined and less immediate goals. Recent studies (Cherek et al., 1997;

Dolan & Fullam, 2004; Kirby et al., 1999; Richards et al., 1999; Wagner, 1993) have shown, however, that a lack of gratification delay can lead to difficulties that can range from the minor (such as neglecting to complete your homework to go to a party with your friends) to the truly disastrous, such as substance abuse along with violent and delinquent behavior.

Delay of Gratification & Substance Abuse

People who abuse illegal substances like drugs regularly succumb to the instant short-term "reward" of intoxication over the more delayed, long-term deleterious effects of such use (Kirby et al., 1999). The decreased desire to delay gratification due to drug use was the purpose of the Kirby et al. (1999) study, which tested the extent to which 56 heroin addicts could delay gratification when compared to 60 non drug-using respondents to an ad in a newspaper. The findings of the Kirby et al. study showed a discount rate ($k = 0.025$) for the heroin users nearly double that of the control group ($k = 0.013$).

The work by Wulfert et al. (2004) served to make a considerable addition in regards to gratification delay and how it affects adolescent involvement in delinquent acts such as violence and alcohol and drug use. In their initial study with a sample of high school students, Wulfert and his collaborators found significant positive relationships between delay of gratification (viz., impulsiveness) and substance use as well as between gratification delay and delinquent school behavior. The second study by Wulfert et al., with a middle school sample, generated similarly significant findings for substance abuse and delinquent school behavior.

Another school of thought primarily involves delay discounting while examining the link between impulsivity and substance abuse through a behavioral economic

perspective (Coffey et al., 2003; Kollins, 2003; Madden, Petry, Badger & Bickel, 1997). This approach is specifically known as temporal discounting, which was defined by Yi, Gatchalian, and Bickel (2006) as "the reduction in the present, subjective value of outcomes that are temporally distant in the future" (p. 311). Economists, like Mazur (1987), concluded that as the experimental wait time for the reward continued to grow, the value of the reward to that particular individual being studied had diminished. Such findings led to the following formula (Mazur):

$$V\ (discounted) = V/\ (1 + kd)$$

Figure 2: V (*discounted*) is the current value of the delayed prize. *V* is the non-subjective value of the delayed prize. The variable *k* is a constant proportionate to the discount rate. The variable *d* is the amount of time from the start of the experiment to the actual time the study subject receives the delayed prize.

The significance of Mazur's (1987) hyperbolic model to this review is the consistency that such a model has in accounting for a larger percent of the variance than comparable models of discounting in the study of delay-discounting. The model has become the standard for use in analyzing substance dependency and other sample groups related to impulsivity (Petry, 2001; Yi, Gatchalian, & Bickel, 2006).

Coffey et al. (2003) and Kollins (2003) continued the evolution of impulsivity-substance abuse study by testing the association itself between self-report assessments and the behavioral economic formula created by Mazur (1987), under the assumption that their independent measurements of the same concept must equate to a significantly measurable relationship between the two. In the 2003 study, Coffey and his fellow behavioral scientists worked with a population of 12 cocaine-dependent users and 13

non-addicted individuals of similar demographics (i.e. gender, age, financial status, and intellect). Money in increments ranging from $1 to $1000 was used as incentives in a delay-discounting system that forced a decision to be made by the participants between an immediate sum with the greatest amount ($1000) and an equivalent amount to be given in one week (Coffey et al.). Coffey and his associates then devalued the immediate amount sequentially down to the lowest possible sum ($1) and the responses of the two groups were measured accordingly. The instruments implemented in the study included the Barratt Impulsiveness Scale (BIS -11[Barratt, 1994]), the Eysenck Impulsiveness Questionnaire (Eysenck, 1984) for impulsivity, and a Mann-Whitney *U* test to compare the monetary rate discounts (*k*) of the two groups. In the Coffey et al. examination, the cocaine-dependent subjects decided on more readily available, lesser payment amounts (e.g. $350 now as opposed to $500 later) than the control group ($U = 33.00$, $p = .04$).

Kollins (2003), who analyzed a population of 47 undergraduates from the Western Michigan University School of Psychology, chose to analyze college-aged students that did *not* have a dependence on drugs and alcohol or abuse them according to any formal set of criteria. Kollins, like Coffey et al. (2003), primarily focused his examination on the expected correlation between delay-discounting (also using Mazur's [1987] function) and self-report assessments. Significant correlations were found among all four variables (*negative* for first alcohol use and age of first marijuana use; *positive* for number of times "passed out" and total number of illicit drugs in lifetime) as well as significant intercorrelations among the variables (age of first alcohol use and age of first marijuana use; age of first alcohol use and total number of illicit drugs in lifetime; age of first marijuana use and total number of illicit drugs in lifetime).

Multiple examinations of the correlation between gratification delay and impulsivity, like the 2003 Coffey et al. study, have been used predominantly with a population of adults with serious drug addictions. This includes the study of Madden, Petry, Badger, and Bickel (1997), which compared the impulse control of 18 members of a drug treatment center with 38 random non-drug using subjects with similar demographic makeups. Using a similar delay-discounting approach, researchers found that the drug-addicted group regarded money at a five-year interval the same as the non-drug-addicted group had at the 25 year mark. Madden et al. also discovered that the drug-addicted group was more impulsive than the control group.

Petry (2001) similarly examined the connection between impulsivity and delay of gratification. They divided pathological gamblers into groups of frequent drug users and non-drug users, along with a control group of non-gamblers. Petry hypothesized that of the three groups, the control group would be the least likely to delay-discount a financial reward, followed by the non-drug-using pathological gamblers, then finally the pathological gamblers with drug addictions. Petry implemented a variety of assessments involving indices for gambling, impulsivity, and substance abuse, along with Mazur's (1987) function, and a delay-discounting procedure similar to Coffey et al.(2003). The results were consistent with Petry's hypothesis - a significant difference between weighted k values based on linear increases for the drug-abusing gamblers, non-drug-abusing gamblers, and the control group, in the expected direction. The importance of such studies using adult subjects like Madden et al. (1997) and Petry (2001) to my particular study lie in their ability to reinforce methods for analysis of gratification delay that are both valid and reliable.

Tangney et al. (1994) concluded that students with heightened levels of self-control gain innumerable benefits over their more impulsive peers; one of which is the decreased likelihood of developing a substance abuse problem. Identical findings were discovered in more topic-specific analyses using self-control and its effect on substance abuse (Wills et al., 1995), and heroin addiction (Storey, 1999).

The study of impulsivity as a predictor of substance abuse has gained significant momentum since 2001 (e.g., Ayduk et al., 2000; Coffey et al., 2003; Gottdiener, Murawski, & Kucharski, 2008; Kollins, 2003; Krueger et al., 2007; Petry, 2001; Tangney et al., 2004; Yi et al., 2006). In that time, this relationship has been examined in numerous ways with multiple populations, working with human subjects like ecstasy users (Hoshi, Cohen & Lemanski, 2007), as well as non-human ones such as rats (Perry, Nelson, & Carroll, 2007) and rhesus monkeys (Woolverton, Myerson, & Green, 2007). However, impulsivity as it relates to student substance abuse, particularly in adolescents, has been relatively ignored, hence the need for further studies like my study.

Delay of Gratification & Violent Behavior

In addition to drug use, the negative outcomes of gratification delay can induce a cycle of negative activity that can ultimately end in violence. Seifert (2006) warns that, "substance abuse creates the need for immediate gratification without thought as to the consequences of the behavior. Many violent youths have the need for immediate gratification and they do not think ahead to the consequences of their behavior" (p.1). In fact, violent juvenile crime has been found to be most prevalent at schools where the children have ready access to illegal substances (Day, 1996).

Studies have shown robust correlations with substance abuse as a powerful influence when coupled with impulsivity as it relates to violent behavior (McDonald, Erickson, & Wells, 2008; Howard & Menkes, 2007). A case in point is the study conducted by Krueger, Markon, Patrick, Benning, & Kramer (2007). The purpose of the study for Krueger and his associates was to find a commonality between the behaviors that influence substance abuse, aggression, and impulsivity – a model known as the "adult externalizing spectrum" (p. 645). 877 undergraduate students from the University of Minnesota - School of Psychology and 916 inmates from a medium-security state prison participated in this study. Using a variety of 20 independent self-report assessments, Krueger et al. studied individual aspects of the adult externalizing spectrum, emphasizing various elements of aggression (e.g. relational, physical, and destructive), impulsivity (e.g. problematic impulsivity, planful control, and impatient urgency), and substance abuse (i.e. alcohol, drug, and marijuana use). For Krueger and his collaborators, these results demonstrated that there is a significant correlation between the domains of aggression, substance abuse and impulsivity.

Another study further supporting the aggression/impulsivity correlation was devised by Cherek et al. (1997) examining the measurable impulsiveness of a group of male parolees and whether their imprisonment was due to a violent or non-violent crime. The parolees were administered two alternative variables – a short-term, lesser financial award versus a longer term, larger financial award. The parolees that were in jail for violent offenses selected the more immediate gratification significantly more than their non-violent counterparts (Cherek et al.).

The importance of these studies to my particular study lie in the premise that individuals who committed criminal acts were also more likely to display a limited ability to delay gratification and had an increased likelihood to exhibit involvement in drugs and acts of violence (Gottfredson & Hirschi, 1990). These studies using adult participants create a baseline for further research, like my study, in the violent behavior involving school aged students in academic settings.

Delay of Gratification and Delinquent Behavior

As stated earlier, success in academics involves a dynamic process that requires effort and sometimes extreme struggle to find the proper solution to a myriad of problems that rarely offer immediate reward (Duckworth & Seligman, 2005). However, the failure to control one's impulses (i.e. lack of patience, focus, or determination) can hinder classroom achievement, which leads to what Lynam and Moffitt (1995) describe as the "diminished effectiveness of school as an agent of control, which in turn allows criminogenic neighborhood influences to gain ascendance" (p. 401). This is how impulsive behavior, or the inability to successfully delay gratification, can lead to delinquency.

Impulse control (gratification delay) as a factor leading to delinquency has been examined for years, with one of the earliest cases involving the Mischel (1961) study. In the 1961 Mischel study, the focus was divided between two separate comparisons of gratification delay capacity: (a) male and female, and (b) delinquent and non-delinquent children. The outcome of the 1961 Mischel analysis yielded a statistical significance (chi square of 6.48) with a much greater percentage of delinquent children (57% to 25%) choosing the immediate reward than the non-delinquent children.

In the last twenty years, impulsivity and delay of gratification has not only a topic of increased study (Lynam, Moffitt, & Stouthamer-Loeber, 1993; Block, 1995; Lynam and Moffitt, 1995), but one for dispute as well. In the 1993 study of Lynam et al, the analysis of the relationship between delinquency and impulsivity was but one of five hypotheses to be examined in an experiment primarily focused on the link between IQ and delinquency in a comparison of black and white elementary students. Contrary to their expections, Lynam and his fellow collaborators found that the relation between impulse control (delay of gratification) and anti-social behavior (delinquency), was stronger than IQ and delinquency.

In reaction, Block (1995) argued that Lynam et al (1993) was preoccupied with the delinquency-IQ relationship, which diverted attention from the more meaningful relationship between impulsivity and delinquency. Block noted that when using path analysis (as in the Lynam study), the arrangement of the variables introduced can have a measurable effect on how those variables influence the final output. Despite its secondary usage in the assessment behind IQ (specifically Verbal IQ), Block remarked that impulsivity still proved to be strongly significant, and with a different analysis of the data, that the impulsivity/delinquency correlation would be even *more* significant than originally expected. With the incorporation of the same data from the Lynam study in a hierarchical model as opposed to the previously used path analysis, Block (1995) discovered that particularly among the black population participating in the Lynam study, impulsivity accounted for nearly 14% of the variance when placed first in variable order, while accounting for nearly 11% of the variance when placed second (compared to 7% and 4% for Verbal IQ respectively). The numbers for the white population in the Block

response to the Lynam study were not nearly as conclusive but were nevertheless significant. Impulsivity explained 11% of the variance as a primary entry, and 6% as a secondary entry (compared to 10% and 5% for Verbal IQ respectively). The reply came quickly. Lynam and Moffitt's (1995) response was that impulsivity is an important determinant for delinquency, though they held that IQ was still essential as a risk factor when examining delinquency.

Using the same sample population of Pittsburgh schoolchildren as Lynam, Moffitt, and Stouthamer-Loeber (1993), White, Moffitt, Caspi, Bartusch, Needles, and Stouthamer-Loeber (1994) brought further support for the relationship between delinquency and impulsivity. White and his colleagues replicated the previous study by finding that youths with low impulse control were more likely to be delinquent in their respective in-school and after-school activities. Two dimensions of impulsivity were discovered by White and his colleagues: cognitive and behavioral. White et al. operationalized cognitive impulsivity as task performance of the pupils, while behavioral impulsivity was assessed mainly via student and teacher ratings of student behavior. Impulsivity and behavioral impulsivity were correlated in age groups of participants that were 10 years old, and participants ages 12 and 13. The consequences of the student's self-destructive actions, both short-term and long-term, were viewed as comparatively insignificant versus the immediate satisfaction gained from the delinquent act by White and his staff.

The first established self-control rating scale (SCRS) for children was created by Kendall and Wilcox (1979). In a study of third through sixth graders, Kendall et al. (1979) asked the teachers of these children to "refer" the ones that had behavioral

problems. In the study, Kendall et al. found that the referred students displayed a measurable lack of control when compared to the non-referred children. The 33-question scale developed by Kendall and Wilcox demonstrated strong reliability and internal consistency and has been used in numerous psychological studies over the years (e.g. Duckworth & Seligman, 2005; Tangney, Baumeister, & Boone, 2004).

The relevance of the studies in this section to my own study lies in the analysis of the impulsivity/delinquency relationship in terms of students that, if older, would likely receive alternative school assignment. Such a connection can be expanded in future research to provide more comprehensive data to school counselors to more swiftly and easily identify delinquency amongst our teenage school population (Knight, Sherritt, Shrier, Harris & Chang, 2002).

Review of Experiments, Longitudinal and Intervention Studies of Delay of Gratification

It is essential for the future theoretical and functional academic implications of delay of gratification to expand the experimental base of knowledge. It should not simply be achieved through correlational studies such as this study, but through the addition of causal experiments, specifically in the form of longitudinal and intervention studies.

Experiments

Classic examples of experiments involve a collection of delay of gratification studies conducted by Mischel et al. (Mischel; 1961, 1966; Mischel & Mentzer, 1962; Mischel & Ebbesen, 1970; Mischel, Ebbesen, & Weiss, 1972; Mischel & Moore, 1973; Mischel & Underwood, 1974; Mischel & Baker, 1975) and Funder, Block, and Block

(1983). In the Mischel, Ebbesen, & Weiss (1972) study, the identical population that was tested as preschool children was re-assessed as teenagers (Mischel, Shoda, & Peake, 1988) to clarify the long-term relationship between delay of gratification and social and scholastic ability. One of the experiments within the study (Mischel et al, 1972) involved the experimenter initiated the activity by displaying toys to the children. The experimenter told the children that he will return in time, but that if they rang a bell, he would immediately return. If the children ring the bell, however, they will receive the toy or reward that they least preferred. The delays created by the departure of the experimenter lasted no longer than 15 minutes. Interestingly, Mischel et al. (1972) found that thinking about the rewards for the participants was not as powerful of a gratification delay strategy as thinking about something "fun". In fact, Mischel et al (1972) concluded that the more the children thought about the missing rewards, the less they wanted to delay. Yet, Mischel, Ebbesen, & Weiss believed that the "fun" distractions were self-imposed by the children to help them get to their ultimate goal – the preferred reward. The greater reward, having been earned rather than simply expected, exemplifies a form of adaptive behavior that is an integral part of Mischel's approach to delay of gratification.

Mischel, W., Shoda, Y., & Peake, P. (1988) further broadened the experimental body of work involving gratification delay by moving beyond merely examining the child's first delay choices and actually analyzing how preschool children maintain a state of delaying gratification in anticipation of their desired outcome. With delay of gratification being defined as a competency, rather than with the child's level of motivation, Mischel et al (1988) believed that gratification delay would affect the child

only as it pertained to adaptive behavior (Funder & Block, 1989). The study (Mischel et al., 1988) provided evidence that delay of gratification is a quality that is both personality-related *as well as* a skill set that can be nurtured over time.

In comparison, the analysis designed by Funder, Block, and Block (1983), with a sample population of 116 four-year-old children, placed a visible present that the child could have as soon as they finished a puzzle. However, because the children were aware that they would receive a present regardless of the outcome (Funder et al., 1983), their *reward* did not have to be earned, and no adaptive or cognitive behavior was used to achieve the ultimate goal of the gift. The results of the study, according to Funder et al. (1983), suggested that the participants that sustained the greatest levels of delay of gratification in the study did so because of inherent impulse control, and these children were predisposed to being more independent, intelligent, cooperative, resourceful, and deliberate. Conversely, the children who scored poorly were described as aggressive, fidgety, immature, and irritable. The importance of the Funder et al. study was the creation of a new school of thought for delay of gratification. Funder et al. regarded gratification delay as an impulse response in the pre-school participants, rather than as primarily an adaptive proficiency.

Longitudinal Studies

Longitudinal research is a form of correlation analysis that requires successive observations of the same populations over an extended time period, which could be months or decades (Centre for Longitudinal Studies, 2011). Due to the strictly observational and non-invasive nature of such testing, it can be debated that such studies are less likely to identify causal relationships than interventions. However, with the

repetition involved in the observational process, longitudinal research would provide more strength than similar cross-sectional analysis, due to its inherent chronological observation and the exclusion of unobserved anomalies that don't vary with time (Centre for Longitudinal Studies).

An innovative new method in longitudinal study involving delay of gratification was recently conducted by Duckworth, Tsukayama, & May (2010). Specifically, the study focused on self-control in terms of abilities such as delay of gratification and its effect on the scholastic success (in this case, GPA) of a sample population of elementary and middle school adolescents. Duckworth et al (2010) argued that longitudinal studies involving methods like structural equation modeling (SEM) were susceptible to unobserved variables, and a possible solution might be in the use of a longitudinal approach comprised of hierarchical linear models (HLM). To effectively establish causation with this approach, Duckworth and her associates (2010) planned to show that self-control (as a personality trait) could be manipulated and subsequently measured as to its effect on future outcomes. The results of the study suggested that self-control could longitudinally predict GPA using the aforementioned method (Duckworth et al, 2010).

Interventions

Intervention studies are crucial in progressing from theoretical correlation studies to practical classroom programs that can train children to bolster their student's aptitude for delaying gratification (Kirby et al, 2002). Multiple methods of interventions (specifically cognitive interventions) have been shown to increase a child's ability to delay gratification in pre-school children. Cognitive interventions are predicated on the

theory that internal thought guides external action (North Carolina Department of Corrections, 2001). Through such interventions, behavioral change can be affected.

Successful approaches to cognitive intervention (Pressley, 1979) are: (a) verbalizations, (b) manipulations, and (c) cognitive transformations. Classic examples of each could again be found with Mischel. Mischel and Patterson (1976, 1977; also Patterson & Mischel, 1975, 1976) examined self-verbalization to help pre-school children to manage their temptation towards immediate gratification. The aforementioned studies of Mischel and Patterson demonstrated that the self-verbalization strategy chosen determined the effectiveness at which the pre-school participants could manage their behavior, with self-instruction that both were reward-based and inhibited temptation were more successful than instructions only relevant to task. Manipulations (Pressley, 1979) were also conducted by Mischel. Mischel and his colleagues (1972) found that when the participants were trained to have "fun thoughts", that particular sample of children was more effective in waiting for the experimenter of the study than those children that were not given the same instruction. Cognitive Transformations (Pressley) Mischel and Baker (1975) demonstrated that preschoolers could cognitively transform prizes to enhance delay-of-gratification. An example of cognitive transformation of the instruction given by Mischel and Baker (1975) to the participants:

> "Clouds are white and puffy. When you look at marshmallows think of clouds. Or you can think how round and white a marshmallow is. The moon is round and white." (p. 257).

Mischel and Baker showed that the children who cognitively transformed the marshmallows delayed gratification longer than the other participants of the study.

More recent intervention studies have also shown evidence of success in the classroom. In the study by Zetocha (2010), the study examined the influence of a three-month intervention on the in-class impulsive behavior of preschool children with predetermined self-control deficiencies. The children were trained both individually and as a classroom in the areas of verbalization, self-monitoring, utilization of production cues, and proper classroom decorum. The focus of the study was to increase the child's ability to control their impulses in a classroom setting. The results of the Zetocha study showed an overall decrease in negative behavior frequency in at least 1 of the 5 target behaviors monitored in 100% of the children tested.

In 2006, Dobbs, Doctoroff, Fisher, & Arnold examined one hundred eight preschool children in a study of how impulsive behavior correlated with mathematics skills. According to Dobbs et al. (2006), participant involvement in a mathematics-based intervention led to fewer behavior problems compared to children who did not receive the intervention. In addition, intervention participation by the students acted as a moderator for the relation between math skills and impulse-related behaviors such as self-control, attachment, and initiative, subsequently showing a lesser correlation with math skills in children who received the intervention.

Unfortunately, such studies have not been replicated with school-aged students. There has been minimal empirical data showing relevancy between such tests and any real-life application in schools (Rodriguez et al., 1989). Such interventions with school-aged populations are becoming urgently necessary.

In this review of the literature, I have shown how critical the act of delaying gratification is in terms of predicting teenage drug use, violent and delinquent behavior

and the scholastic collapse that subsequently results in alternative school placement. I first outlined the function of alternative schools locally and nationally and their increased need in our nation's struggle to educate our children. Secondly, delay of gratification was defined along with its connection to impulsivity. Next, I gave an examination of the history of the research in the field of delay of gratification through an expansive display of the up-to-date body of work in the field, while demonstrating the critical role of delay discounting as a method for testing gratification delay. I then described the relevant studies illustrating the correlation between delay of gratification and variables like substance abuse, violent behavior, and juvenile delinquency and how they ultimately influence scholastic success. Lastly, I discussed the importance of causality in strengthening the integrity of this study's theoretical and practical implications both today and in the future.

CHAPTER 3: METHOD

Research Hypothesis

Delay of gratification is positively related to academic achievement and negatively related to substance abuse and violent and delinquent behavior.

Participants/Sample Size Justification

The participants in this study were 391 middle school children chosen from an alternative learning school in Florida. The alternative school is comprised of a rotating population of students (e.g. 164 middle school children: 2nd quarter - 2009-2010 fiscal year) that attend for 45 school days, or one quarter, at which time they are reinstated back in their original schools. With a yearly total of 669 students and a minimal performance percentage of 50.0%, the confidence level is 3.2% (Creative Research Systems, 2010). Reasons for non-participation included unsigned parental consent forms (due primarily to lack of guardian availability) and discrepancies in the survey process (i.e., circling the same answer for every question on every survey).

The racial demographics for the sample population taken from the alternative school are Caucasian (56%), Hispanic (28%), African-American (14%) and other ethnicities (2%). Academic class percentages are sixth graders (22%), seventh graders (35%), and eighth graders (43%). Socioeconomically, the percentage of the alternative school students on free or reduced lunch is 88.0%.

Permission was obtained from all the instructors and principal of the participating school, as well as the school's district office. Approval from the parents and students of

the alternative school taking part in this study was received. The participants of the study were chosen based on the signed completion of both the authorized parental consent and the student assent forms.

Measures/Instruments

Convergent Validity of Self-Report Measures

Successful studies in psychology rely not only on quality case design and theoretical consensus, but also on universally agreed-upon instruments that provide the requisite validity to achieve both accuracy and precision (Mischel, 2009). A meta-analysis conducted by Duckworth and Kern (2011) concluded that the self reports tested in their study had convergent validity equivalent to that of other forms of psychological measures that did not involve self-reporting. Three self-reporting measures were administered during this study.

Delay of Gratification

The 10-question Academic Delay of Gratification Scale (ADOGS) was created by Bembenutty and Karabenick (1998a) to test the probability that a student would make choices based on long-term consequences rather than short-term temptations, e.g., "stay in the library to make certain that you finish an assignment in this course that is due the next day, OR leave to have fun with your friends and try to complete it when you get home later that night" (p. 18). ADOGS is a student self-report that was developed specifically for *academic* delay of gratification, due to evidence supporting the theory that gratification delay is domain-specific (Bembenutty, 1999; Mischel & Metcalfe, 1999). The participants answer using a 4-point scale (Bembenutty & Karabenick, 1998a):

(a) definitely choose A; (b) probably choose A; (c) probably choose B; and (d) definitely choose B. In terms of validity, the ADOGS was used in two studies (Bembenutty & Karabenick, 1998a & 1998b) and exhibited numerous positive relationships between delay of gratification and academic motivation, self-efficacy, and intrinsic interest in learning, with acceptable reliability (.77 in prior studies, .74 for the present study). Higher scores represent a greater ability to delay one's gratification in academic endeavors.

Substance Use

The CRAFFT Substance Abuse Screening Test, developed by Knight, Sherritt, Shrier, Harris, and Chang (2002), has a simple 6-item survey (an answer of yes is one point) that tests for alcohol, marijuana, and serious drug use. An example question is "Do you ever use alcohol or drugs while you are by yourself, alone?" The internal consistency estimate showed strong reliability (alpha = .79), somewhat higher than found in the study by Knight et al. (alpha = .68). Higher scores represent greater likelihood of engaging in substance abuse.

Violent Behavior

The Anger Response Inventory (ARI), designed by Tangney, Wagner, Marschall, & Gramzow (1991), is a self-report instrument that analyzes a student's response to a succession of hypothetical events that are intended to evoke anger. Participants use a 5-point scale to rate their level of anger in each scenario. An example statement is "Your friends make fun of you in front of someone else". Higher scores suggest a greater likelihood of engaging in violent behavior.

The validity and reliability of the ARI were substantiated in two studies (Tangney, Barlow et al., 1996; Tangney, Wagner et al., 1996). Reliability of the ARI scales were verified by test-retest correlations and estimates of internal consistency (alpha = .89); whereas, validity was established through positive correlations between multiple forms of self-report in response to aggression management as well as specific behavioral episodes (Tangney, Baumeister et al., 2004). For the current study, internal consistency was similar to that found in prior research (alpha = .88). This assessment was renamed ANGER in this study for the sake of clarity.

Academic Achievement

Florida Comprehensive Assessment Test (FCAT) scores in mathematics and students' GPAs were collected as evidence of academic achievement. The reliability of these variables, when measured against each other, was outstanding (alpha = .88).

Demographic Measures

Data was collected on students' year in school (GRADE), socioeconomic status (SES), and gender (GENDER) to control for the influence of these variables on academic achievement.

Procedures

The instruments (ADOGS, CRAFFT, and ANGER) were given to each student in this study at the beginning of each school quarter commencing August 2009. The participants were not to place any personal information, other than their first and last

name, on any paperwork involving this study. An oral description of the study was given to the participants prior to their partaking in said study.

Participants received a student assent document as well as a consent document for their parent/guardians from the researcher while at ALC West. Their respective signatures were necessary on both documents for their participation in the study, as well as to give the researcher permission to report the student's responses anonymously in the final manuscript to be submitted to the faculty advisor as part of the coursework.
The participants gave their informed assents and the parents gave their informed consents for their child's participation to allow the students to be eligible for participation in the study and to receive the aforementioned surveys for completion. Per the Protection of Pupil Rights Amendment (PERPA), parents had the right to review the content of this survey upon request, which they could obtain from me in person at ALC West after setting an appointment with me by phone. There was no compensation or other payment to the parent or the student for the student's participation in the study.

Data Use, Collection, and Protection

The identity of the participants will be kept confidential. No one, except for the researcher (Mr. Herndon), will know who had participated in this study (including the district office). No one will know how each child had answered the questions in this study, including their parents. The child's name was kept separate from the information he or she was given, and they were stored in different places. The child's information was assigned a code number. The list connecting your child's name to this number was kept with a password protected computer.

The surveys themselves were stored under lock and key in a designated cabinet in Mr. Herndon's room that was separated from the student population until all the necessary information was completely reviewed. A copy of this study's results will be given to the District, but it will be in group format and the individual students will not be identified. The names of the children were not used in any report, so no one could know how the children answered. When the study was done and all the students' questions answered, the sensitive information was destroyed for the safety of the child participants involved.

Risks/Benefits

There were no anticipated risks for participating in this study. Participation was voluntary. The students took part in this study only because they and their parent(s) wanted them to. The children would not lose any benefits they would normally be entitled to. The parent(s) had the right to stop their child from taking part at any time by simply contacting the researcher or a member of the research team. The parent(s) were told prior to the studies of any new information that may affect their willingness to allow their child to continue taking part in this study.

There was a slight risk of breach of confidentiality if the student's information or the student's identity was obtained by someone other than by the researcher, but precautions were taken to prevent this from happening.

For those students that had used drugs and/or alcohol, help was made available voluntarily from Southwest Florida Addiction Services (SWFAS), a South Florida group

that deals with adolescents with substance abuse issues. The students could also seek help and/or guidance from the school counselor.

There were no direct benefits to the students for participating in this study. Indirect benefits included learning more about the process of research and becoming more reflective of the understanding of the parent(s) on how the need for immediate gratification influences the student's life.

Data Analysis

Data analysis was conducted on the primary predictor variable (delay of gratification), alternate predictor variables (substance abuse and violent behavior) and the ultimate outcome variable (academic achievement) of this study. Initial statistical inquiry involved descriptive statistics (mean, standard deviation, kurtosis and skew) of the aforementioned variables, partial correlations (variable interrelationships), and the formulation of a multiple regression path analysis to investigate the particular paths individually within the proposed theoretical model (Wagner, 1993). Florida Comprehensive Assessment Test (FCAT) Math scores and classroom grades (GPA) were evaluated against the survey results of the predictor variables to test the validity of the hypotheses.

Assumptions

1. The sample population of the alternative school will demonstrate a relevant cross-section of Florida middle school children in terms of ethnicity, socio-economic status, and previous scholastic achievement.

2. A composite of multiple self-reports and subscales to be analyzed in this study should not only allow for interpretations of delay of gratification independently, but collectively.

CHAPTER 4: RESULTS

Descriptive Statistics

Descriptive statistics were created for the predictor variables (CRAFFT, ADOGS, and ANGER) and the outcome variables (MATH and GPA). The distribution of the scores shows the predictor variables to be symmetric and mesokurtic, with ADOGS being negatively skewed and ANGER and CRAFFT being positively skewed. The distribution of the scores for the outcome variables (MATH and GPA) are slightly leptokurtic and positively skewed.

Frequency Distribution

The standardized test scores (MATH) were distributed noticeably to the lowest levels over 76% scored at Levels 1 & 2 out of a possible 4 levels (Level 3 is considered passing). The grade point averages (GPA) of the middle school alternative population in the study were predictably very low, with nearly 80% of the population posting below a 3.0 GPA.

The *gender* numbers for the study skewed towards the male population (53.5%) when compared to the contributing female students (46.5%). Expected high percentages at low levels were found in both genders for both MATH and GPA with no significant difference between each gender.

The *grade level* of the sample population for the study increased in total percentage by each subsequent grade level: sixth graders (22%), seventh graders (35%), and eighth graders (43%). The progression by grade level is expected due to recidivism

of students who keep returning year after year added to the new student population. Expected high percentages at low levels were found at all grades in MATH and GPA with no significant difference between each grade level.

The *socio-economic status* of the participants in the study was measured by whether the students receives free or reduced lunch, which is an indication of low socio-economic status based on the need for state assistance. Nearly 88% of the participating alternative middle school students in the study received free or reduced lunch. Expected high percentages of free and reduced lunch students at low achievement levels were found for MATH and GPA.

The percentages pertaining on *ethnicity* in the study were Caucasian (56%), Hispanic (28%), African-American (14%) and other ethnicities (2%). No significant difference was found between the ethnicities in MATH or GPA.

Variable Frequencies

An examination of the Frequency table (*see* Table 1) revealed the mean and standard deviation for each variable of the study. The standardized test scores (MATH) was measured on a scale from 1 to 5, as was the Anger Response Inventory (ANGER) and Academic Delay of Gratification Scale (ADOGS) assessments. The grade point average (GPA) was on a 4-point scale, and the CRAFFT Substance Abuse Screening Test on a 6-point scale.

The results showed below average scores in both MATH and GPA scores. Delay of gratification (ADOGS) results showed a low level in the students' ability to delay gratification in academic settings. Higher scores would have suggested a greater ability to

delay one's gratification in academic endeavors. Anger Response Inventory (ANGER) scores suggested a strong likelihood to engage in violent behavior (higher scores equal greater likelihood). The results of the CRAFFT Substance Abuse Screening Test suggested that the alternative school population sampled exhibited a propensity towards engaging in substance abuse, especially when considering CRAFFT is primarily aimed at the assessment of high school students, and not middle school children (higher scores represent a greater likelihood of substance use).

Table 1: Frequencies

	MATH	GPA	CRAFFT	ANGER	ADOGS
N	391	391	391	391	391
Mean	1.96	1.46	3.26	3.62	2.17
Std. Deviation	1.04	0.72	2.04	0.86	0.63

Factor Analysis of Predictor Variables

The *KMO* and *Bartlett's* tests for ADOGS (.583; .000) and ANGER (.758; .000) showed significant results, which indicated that it was reasonable to continue with the factor analysis on these two variables. CRAFFT was deemed insignificant for both tests and was subsequently removed from future factor analyses.

The *Total Variance Explained* proved significant for all twelve questions of ANGER and all ten questions of ADOGS when extracted to the Communalities table. Four components from ANGER and three components from ADOGS were retained (nearly 71% of the cumulative variance for ANGER and 66% for ADOGS).

Correlations

An inspection of the *Correlation* matrix (*see* Table 2) revealed that the resulting scores of all the assessments (ADOGS, ANGER, & CRAFFT) had a strong correlation ($p < 0.01$) with the mathematics state assessment outcomes (MATH) and the grade point averages (GPA) of the participating students. Additionally, academic delay of gratification (ADOGS) scores related to decreased violent behavior (ANGER) and a lesser likelihood of substance abuse (CRAFFT). No relation was found between CRAFFT and ANGER scores.

Table 2: Correlations

	MATH	GPA	CRAFFT	ANGER	ADOGS
MATH	1.00				
GPA	.693**	1.00			
CRAFFT	- .293**	- .265*	1.00		
ANGER	- .365**	- .301**	- .023	1.00	
ADOGS	.344**	.220**	- .310**	- .166**	1.00

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

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

Multiple Regression: Path Analysis of the Hypothesized Model

The original hypothetical model (*see* Figure 2) presented both the direct and indirect effects of delay of gratification on the academic achievement of alternative middle school children, with the indirect effects mediated by substance abuse and violent behavior. The model also presented the nominal variables of gender, grade level, ethnicity and socio-economic status and their direct effect on delay of gratification. The testing of the path model began with analyzing the relationships between the nominal variables (GENDER, SES, ETHNICITY, & GRADE) and ADOGS.

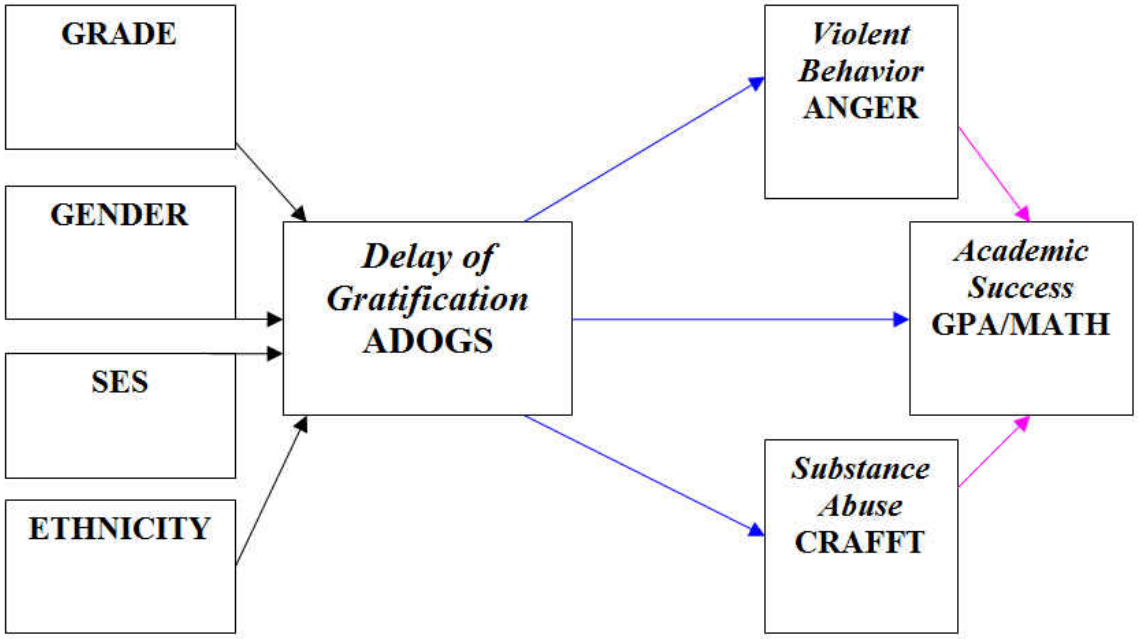


Figure 2: Theoretical model of hypothesized relations between nominal variables and delay of gratification and predictor variables and academic achievement

The results of the individual regressions (*see* Table 3) between each nominal variable and ADOGS gave clear evidence that the independent paths of the nominal variables did not lead to significant relationships with ADOGS (for $p < .001$ and $p < .05$): SES (.183), GENDER (.205), GRADE (.982) and ETHNICITY (.726). The nominal variables were subsequently removed from future regressions and path models.

Table 3: Regression results

	B	*t*	*p*-value (sig.)	R^2 change
SES	- .067	- 1.333	.183	.005
GENDER	.064	1.270	.205	.004
GRADE	- .002	2.180	.962	.000
ETHNICITY	.018	.350	.726	.000

*$p < .05$ **$p < .001$

The revised path model (*see* Figure 3) presents both the direct and indirect effects of delay of gratification on the academic achievement of alternative middle school children, with the indirect effects mediated by substance abuse and violent behavior. The

testing of the path model began with analyzing the relationships between delay of gratification (ADOGS), violent behavior (ANGER), and substance abuse (CRAFFT) and both measures of academic achievement (MATH and GPA).

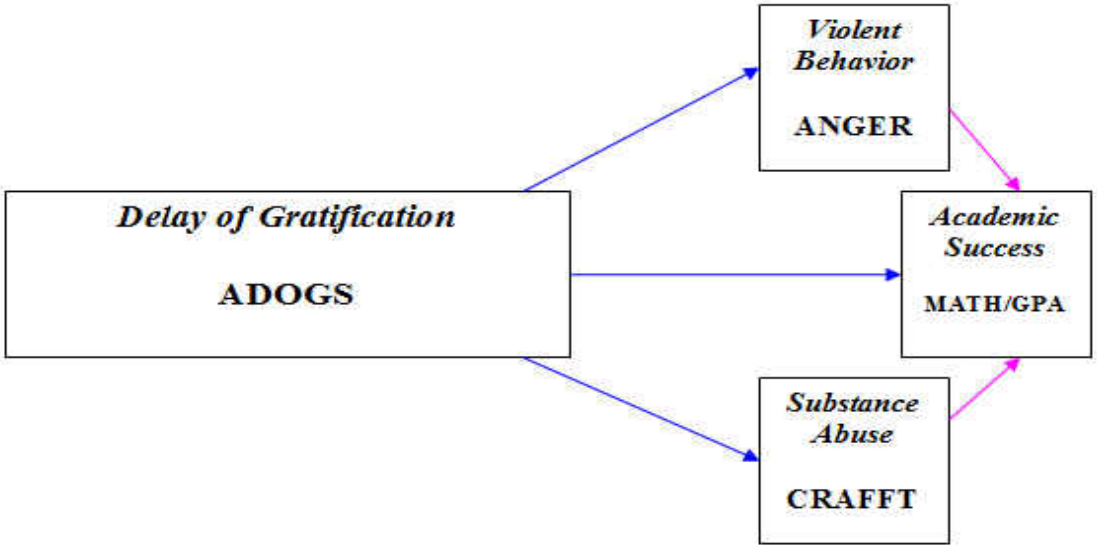


Figure 3: Revised model of relations between predictor variables and academic achievement

MATH was tested as the dependent variable while ADOGS, ANGER, and CRAFFT were tested as predictor variables. The three predictor variables accounted for over 28% (.282 = R^2) of the variance in MATH, while the *ANOVA* indicated their value as predictors to be highly significant, $p < .001$ (.000). The Standardized Coefficients (Beta) were obtained from the *Coefficients* Matrix (*see* Table **4**) and placed on the final path model (*see* Figure 4): **-.334** for ANGER, **.215** for ADOGS, and **-.234** for CRAFFT.

Table 4: Coefficients - Math Standardized Scores

	B(beta)	B	*p*-value (sig.)	SE B
ANGER	- .334	- .325	.000**	.043
ADOGS	.215	.287	.000**	.062
CRAFFT	- .234	- .096	.000**	.019

*$p < .05$ **$p < .001$

GPA was analyzed as the dependent variable in place of MATH. The three predictor variables (ADOGS, ANGER, & CRAFFT) accounted for over 17% (.173 = R^2) of the variance in GPA, while the *ANOVA* indicated their value as predictors to be highly significant to $p < .001$ (.000; ADOGS was significant to $p = .05$ in *yellow*). The Standardized Coefficients (Beta) were obtained from the *Coefficients* Matrix (*see* Table 5) and placed on the final path model (*see* Figure 5): **-.291** for ANGER, **.097** for ADOGS, and **-.241** for CRAFFT.

Table 5: Coefficients – Grade Point Average

	B(beta)	B	*p*-value(sig.)	SE B
ANGER	- .291	- .246	.000**	.040
ADOGS	.097	.112	.050*	.057
CRAFFT	- .241	- .086	.010**	.01

*$p \leq .05$ **$p < .001$

ANGER was analyzed as the dependent variable with ADOGS as the predictor. ADOGS accounted for only about 3% (.028 = R^2) of the variance in ANGER, while the *ANOVA* indicated its value as a predictor to be significant to $p \leq .001$ (.001). The Standardized Coefficient (Beta) was obtained from the *Coefficients* Matrix and placed on final path model (*see* Figure 4 & Figure ***5***): **- .166** from ADOGS.

CRAFFT was analyzed as the dependent variable with ADOGS as the predictor. ADOGS accounted for almost 10% (.096 = R^2) of the variance in CRAFFT, while the *ANOVA* indicated its value as a predictor to be significant to $p < .001$ (.000). The Standardized Coefficient (Beta) was obtained from the Coefficients Matrix and placed on final path model (*see* Figure 4 & Figure ***5***): **- .310** in ADOGS.

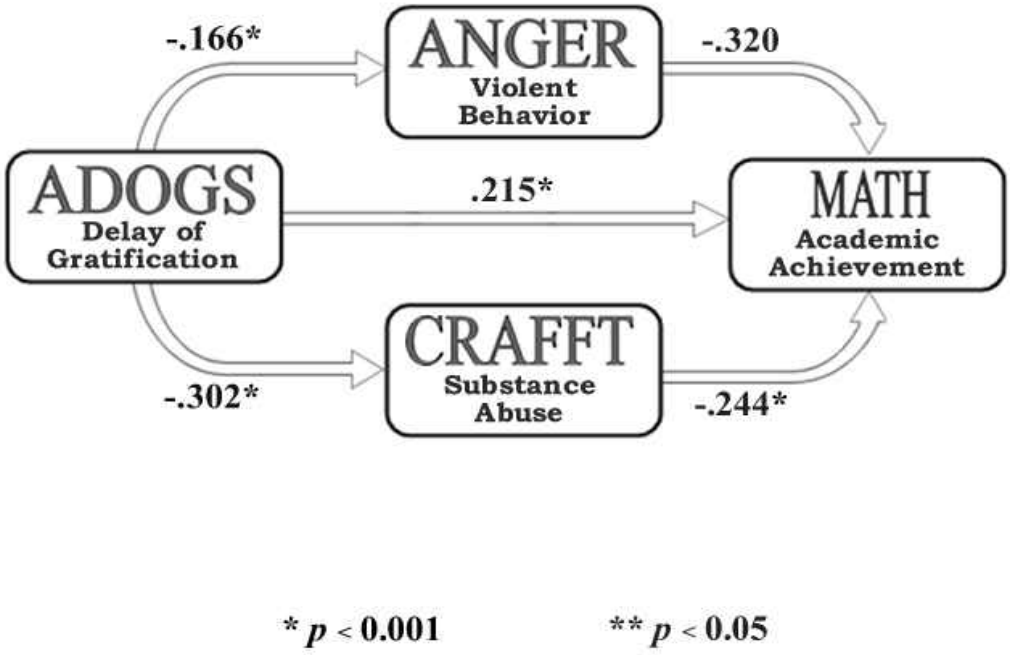


Figure 4: Model of final relations between predictor variables and academic success (MATH)

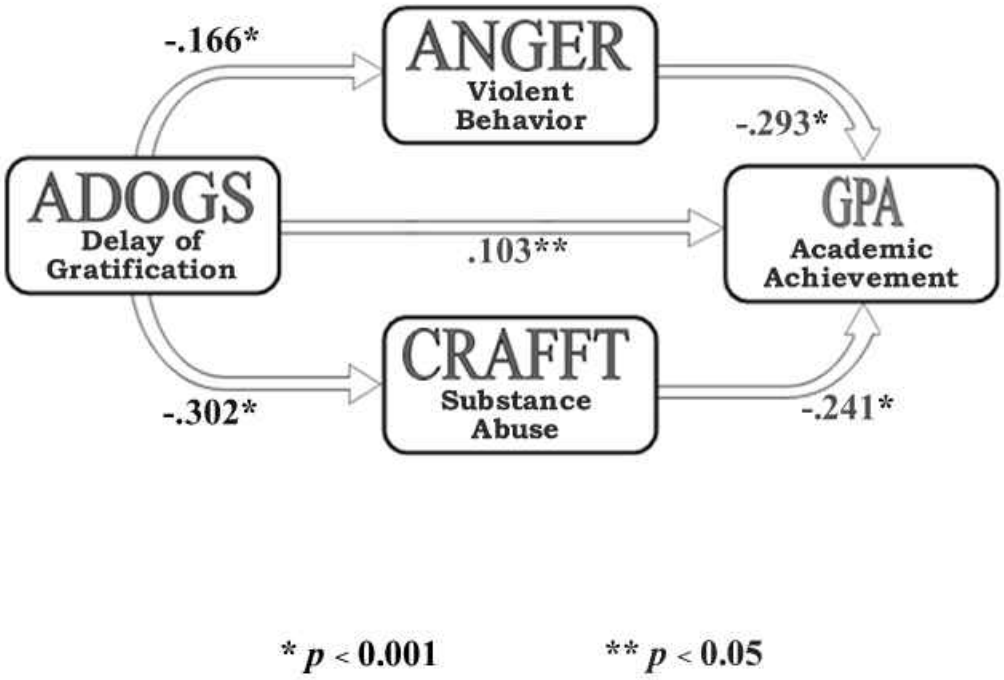


Figure 5: Model of final relations between predictor variables and academic success (GPA)

Summary

The results of the final path models (see Figure 4 & Figure **5**) supported the hypothesis that delay of gratification is negatively related to substance abuse and violent and delinquent behavior, and positively related to academic achievement. Evidence also suggested that substance abuse and violent behavior were significantly related in student academic achievement.

CHAPTER 5: SUMMARY & CONCLUSIONS

The primary aim of this study was to examine how delay of gratification in a sample population of alternative middle school students, particularly in terms of violent behavior and substance abuse, correlated to their academic achievement.

In this chapter, I will first summarize the results of the analysis of the research question and address the results of the multiple regressions. Second, I will explore some of the implications of these results for policy and practice and will suggest directions for further research. Third, I will review the limitations of the study and the fourth section will be the conclusion.

Summary of Analyses

The research question for this study examined the following:

> Can delay of gratification be a viable and quantifiable variable in the search to resolve the proliferation of substance abuse, violent behavior and declining academic performance in today's youth?

The present study found that delay of gratification was related to all three variables. Previous studies in the areas of delay of gratification and academic success did not study middle school children. They primarily examined preschoolers (Humphrey, 1982; Kurdek & Sinclair, 2000; Mischel, 1958, 1961, 1966, 1974; Mischel & Ayduk, 2002; Mischel & Metcalfe, 1988; Rodriguez, Mischel & Shoda, 1989), high achieving public school or magnet school students (Duckworth & Seligman, 2005; Funder & Block, 1989; Funder, Block & Block, 1989), and college students (Bembenutty and Karabenick, 1998; Hogan & Weiss, 1974; Wolfe and Johnson, 1995; Mansfield, Pinto, Parente, and

Wortman, 2004; Tangney, Baumeister, and Boone, 2004; Magen & Gross, 2007; Silva & Gross, 2004; and Spinella and Miley, 2003). None of the aforementioned prominent studies in the field ever used an alternative school population. The present correlational study highlights a need for an intervention study of the previously unstudied sample of an alternative middle school population to add to the body of delay of gratification research.

The present study shows that gratification delay is related to student, which, in line with previous experimental research, suggests that teaching students to delay gratification should be developed as a part of our school curriculum. From the studies of Mischel in the 1960's that predicted adolescent behavior by pre-school gratification delay choices, to the current studies of Bembenutty (2009a, 2009b, 2009c), delay of gratification has emerged as a significant factor in determining a student's scholastic success. With our growing societal fixation on immediate satisfaction (Time, 2006), researchers (Duckworth & Seligman, 2005; McClure, 1986) have long predicted academic failure for America's schoolchildren due to an inability to successfully delay gratification. The results of the present study showing a positive correlation between gratification delay and academic achievement are consistent with several studies (e.g., Wulfert, Block, Santa Ana, Rodriguez & Colsman, 2002) that have highlighted an urgent need for more causational study to advocate the implementation of new curriculum that includes strategies for the development of gratification delay.

Supplying counselors with the data to support the continued growth of substance abuse and anger management programs is vital to help bolster academic achievement. Studies have not been done in terms of substance abuse and anger management as they pertain to academic achievement or delay of gratification. The limited studies that

examined anger management and delay of gratification focused on adult inmates (Dolan & Fullam, 2004), while the analyses of substance abuse and delay of gratification utilized a variety of mainly adult populations including pregnant women who smoked after pregnancy (Yoon, Higgins, Heil, Sugarbaker, Thomas, & Badger, 2007), gambling addicts (Petry, 2001), and college students (Kollins, 2003). The findings in the present study correlating substance abuse, violent behavior and the negative relationship that they have on academic achievement shows that delay of gratification is not only related to students' academic progress, but also to the likelihood of their engaging in substance abuse and violent acts. Therefore, the correlations provided in this study necessitate a causal examination to justify the need for gratification delay training for issues beyond achievement, including as a possible treatment or co-treatment for substance abuse and anger management programs.

The results of the present study can give school superintendents a greater understanding of how the variables tested in this study relate to student assignment in alternative school programs. Alternative schools are utilized more than any other form of dropout prevention in the United States (Souza, 1999). Previous studies (e.g. Suh, Suh, & Houston, 2007) indicate that a significant factor in a pupils' likelihood to dropout and subsequently be detained in alternative programs is their academic deficiency as measured by grade point averages according to research. Past studies (e.g. Grunbaum, Kann, & Kinchen, 1998) also showed that students in alternative schools have a measurably stronger predilection towards violent behavior and substance abuse than students from public schools. The aforementioned studies worked with alternative high school populations. The present study indicated that variables like delay of gratification,

substance abuse, violent behavior all relate to the academic achievement of alternative middle school alternative students as well.

The hypothesis for this study was supported by the results of the multiple regressions: Student's ability to delay gratification was significantly related to illegal substance use, violent behavior, and classroom performance. Further, greater ability to delay gratification, lower levels of substance abuse, and lesser tendencies towards violent behavior each predicted higher standardized math scores in the middle school children in alternative learning environments that were tested as well as higher GPA scores.

Implications and Directions of Future Research

For years, isolated studies on delay of gratification in an academic setting (such as Pressley, Reynolds, Stark, & Gettinger, 1983) brought to light the importance of developing a student's ability to delay gratification to enhance their information comprehension. But until the late 1990's, the study of academic delay of gratification was largely ignored until Bembenutty, individually (1999, 2009) and in collaboration with Karabenick (1998a, 1998b, 2004), conducted a series of studies that clearly illustrated the critical need to cultivate a child's capacity to delay gratification to succeed in the classroom along with a glaring deficiency in academic delay research. The implications of such studies on alternative students, however, have yet to be examined.

One of the critical questions in regard to this study is why is it important for educators to understand the relationship between delay of gratification and variables like impulsivity, violent behavior, substance abuse, and academic achievement?

In answer to this question, the present study demonstrated that delay of gratification is strongly related to each of the following behaviors of the alternative student population tested: (a) academic achievement (b) their ability to resist the temptation to act violently and (c) use illegal substances. The path model also shows correlations between academic achievement and grade point average, violent behavior and grade point average, violent behavior and standardized math scores, substance abuse and standardized math scores, and substance abuse and standardized math scores

It is critical that educators and administrators understand these relationships and create an academic plan with a focus on cultivating proficiency in delaying gratification (Bembenutty & Karabenick, 2004; Kirby et al, 2002; Pressley, 1983). Delay of gratification can improve a student's capacity to process information and enhance their learning (Pressley, 1983). School counselors can utilize assessments like the Academic Delay of Gratification Scale (ADOGS) as a screening tool to measure a student's aptitude in gratification delay (Bembenutty, 1999). Programming levels can be created for the student development of gratification delay just as it is done for core subjects like mathematics and English.

The correlational findings of this study imply the need for the creation of more school programs emphasizing anger management and the control of substance abuse. School counselors can use assessments like the CRAFFT substance abuse screening test to rapidly identify students that are in need of either a referral to a substance abuse program or further observation and assessment (Knight et al., 2002). The ANGER assessment (the full version of the Anger Response Inventory; Tangney, Wagner,

Marschall, & Gramzow, 1996) can be used by counselors to test a student's level of anger management in a series of simulations that are created to arouse anger responses.

In this study, violent behavior was more strongly related to the academic success or failure of at-risk adolescents than their use of controlled substances. This seems to indicate that certain children can succeed even under the influence of illegal substances, yet if a student acts violently in a school setting, that behavior is far more likely to lead to disciplinary actions that seriously hinder a student's opportunity to succeed by taking them out of the classroom. While there have been numerous studies that have featured the distinct correlations between substance abuse and academic achievement (the most recent: Biglan, Dent, Seeley, & Smolkowski, 2006; Bountress, Chassin, Haller, & Handley, 2010; Caldwell, Henry, & Smith, 2007; Engberg & Morral, 2006; Godley, 2006; Jeynes, 2002; Kostelecky, 2005) and violent behavior and academic achievement (the most recent: Chen, G., 2007; Osborne, 2004) respectively, none of these cases examined the comparative effect of both violent behavior and controlling substances on academic achievement, hence the need for future research in this area.

A notable finding was the measurable lack of significance shown in this study between violence and substance abuse. These findings, however, are not corroborated by several recent studies examining the direct correlation between substance abuse and violent behavior. For years, there was substantial study correlating violent behavior or drug abuse to gratification delay and other predictor variables (Cherek, Moeller, Dougherty, & Rhoades, 1997; Kirby, Petry, & Bickel, 1999; Kirby, Winston, & Santiesteban, 2002), as well as the prevalence of criminal juvenile violence in school locations with accessibility to controlled substances (Day, 1996; Dolan & Fullam, 2004;

Tangney, Barlow, Wagner, et al., 1996; Tangney, Wagner, Barlow, Marschall, & Gramzow, 1996; Tangney, Wagner, Marschall, & Gramzow, 1991). However, until recently, there was a dearth in the number of studies isolating the direct relationship between violent behavior and drug abuse (Bukstein, 1996; Wagner, 1996). In the last decade, the national increases in adolescent violent behavior and drug abuse (Time, 2006) caused a surge in the research focused on the correlation between the two, particularly with at-risk children (Brady, Flores, Ozer, Pasch, & Tschann, 2008; Chalton, Flisher, & Liang, 2003; Conner, Longshore, & Stein, 2009; Howard & Menkes, 2007; Kjelsberg, 2008; Komro, Maldonado-Molina, Perry, & Tobler, 2010; McDonald, Erickson, & Wells, 2008; Sabri, Williams, Smith, Jang, & Hall, 2010). A possible explanation for why these studies produced different findings than the present study could be the omission of middle school students from their samples. Despite the increase in the body of work focused on violent behavior and substance abuse, a rare number of these studies (e.g., Rainone, Schmeidler, Frank, & Smith, 2006) included middle school students. Furthermore, studies like Rainone et al. (2006) found the role of substance abuse in the violent behavior of middle school students to be a less significant factor than with the high school students also tested. The present study would seem to indicate that substance abusers are not necessarily violent, and that violent children do not necessarily abuse drugs or alcohol.

Another atypical finding of this study was that gender, socio-economic status, grade, and ethnicity proved non-predictive. However, studies as far back as Mischel (1966) and Friere, Gorman & Wessman (1980) have showed delay of gratification to be highly correlated with SES. Multiple studies also found that delay of gratification is

highly predictive of gender in terms of females showing more ability to delay gratification (Bembenutty, 2007, 2009b; Duckworth & Seligman, 2006; Silverman, 2003).

Reasons for the lack of correlation between SES and delay of gratification in this study could be due to the overwhelming percentage (88%) of low socio-economic students thereby reducing the variability in this measure. As for the lack of predictive results between delay of gratification and gender, although there has certainly been evidence of a relationship (Bembenutty, 2007, 2009b; Duckworth & Seligman, 2006; Silverman, 2003) in past analyses, results in studies have varied. In the 1961 Mischel study, the focus was divided between two separate comparisons of gratification delay capacity: (a) male and female, and (b) delinquent and non-delinquent children. The outcome of the 1961 Mischel analysis was *not* statistically significant for male versus female. Kolnik, Faria, & Yale-Kaiser (2007) found that the *males* in their study were more apt to delay gratification than the female participants with a low socio-economic, predominantly African-American population sample.

Given the importance of delay of gratification, what can teachers do within a school setting to improve their students' capacity to defer gratification? An essential element in strengthening the student's ability to disregard distractions that would interfere with their educational achievement can be found in the curriculum of the classroom teacher. Possibilities include instruction in gratification delay skill development (Bembenutty, 2009c), and training students how to elude the negative temptations that bombard them daily. Alternatives for such instruction could include aiding students in understanding cognitive and organizational strategies like time

management and goal setting, including the use of weekly planners and work logs (Bembenutty, 2009b).

Other possibilities include out-of-school programs that not only teach the children the power and importance of delaying immediate gratification in all phases of their lives, but teach *their parents* the ability to develop gratification delay within their own homes as well. Examples of such programs include projects like Money Savvy Generation (Beacham, 2007), a foundation originated for the purpose of helping youths and their parents enhance their skills in general financial skills and delaying gratification. Beacham's program revolves around a piggybank that gives children four options for saving their money – Spend, Save, Invest, or Donate, which gives the kids the necessary forethought needed to properly decide what they will do with their money prior to spending it, allowing them to weigh the rewards and the consequences. However, programs like this can only work in our American public school system if they are given the opportunity.

Limitations

There were several limitations in this study:

1) The ranges found in delay of gratification results may be limited in the alternative learning environment due to expected lower levels in their ability to delay gratification. Children in these environments generally tend to act more impulsively than their regular public school peers regardless of their grades, which may be a result of their inherent intelligence level or

upbringing (White, Moffitt, Caspi, Bartusch, Needles, & Stouthamer-Loeber, 1994).

2) Self-reports, like the ADOGS, do not allow for a child's selection between options of whether to delay or not to delay gratification (Bembenutty, 1999); and are highly predisposed to peer pressure (Bembenutty & Karabenick, 1998a). The participating alternative students are prone to being easily swayed by their fellow students (Kleiner, Porch, & Farris, 2002).
3) The students involved in the alternative learning portion of the study are solely from one county (Lee) in Florida. These children involved were not chosen at random, and could only participate with parental consent (Wulfert et al, 2002).
4) Growing criminal activity in regular schools is hard to gauge due to increase in alternative school enrollment. School districts rarely use alternative school statistics when highlighting their school security statistics (NSSC, 2006).
5) Due to the overwhelming percentage of lower socio-economic (SES) children, the SES portion of the findings is inherently insignificant.
6) National studies on alternative schools and children at-risk are subject to the whims and budgets of the government, and are rarely done on a consistently annual or even bi-annual basis.
7) Since concrete acts of delay of gratification were not witnessed as a part of the experiment, the students' behavior is inferred through correlations and not causation (Bembenutty, 2009c).

In spite of the limitations, the findings of this study contribute data about an issue (gratification delay) that is demanding serious national attention in conjunction with the issue of an ever-growing population of alternative schools aimed at youthful delinquents. Additional empirical research on delay of gratification using this specific type of alternative school population, particularly in direct comparison with students in the regular public school system, would be a worthy replication of the present study. It is critical to administer longitudinal analyses across a variety of differing populations to determine the accuracy of the current results (Bembenutty, 2009a).

Conclusion

Although this study showed that delay of gratification is positively related to academic achievement and negatively related to substance abuse and violent and delinquent behavior, there are few readily available solutions that exist in our American public school system to solve this growing dilemma. As it currently stands, only a coordinated effort in the advancement of the knowledge base of relevant data concerning delay of gratification in all its forms can accelerate the needed creation and implementation of programs within our schools; programs that could enhance the capability to delay gratification within our children. Studies must be administered to test the long term effects of cognitive interventions in our public school classrooms.

A rare example of such a classroom intervention was done by Sagotsky, Patterson, and Lepper (1978). They examined the effect of a gratification delay intervention on the learning behaviors of mathematics students in the fifth and sixth grades. Classroom behaviors pertaining to in-class study time and math work completed

were observed and recorded. The students set goals for the number of problems they could solve in one class period, and subsequently recorded the actual number of problems solved at the end of the class period. The participating students were also responsible for reporting their daily study habits and daily in-class production. The control groups were solely involved with logging their completed work. Sagotsky et al (1978) found that self-monitoring increased the study time and quantity of work completed during each math period.

As stated by Mansfield et al. (2004), the more thoroughly we understand the determinants that lead to scholastic achievement, the more capable we will be in offering critical instruction in time to make a meaningful impact on our children's ability to succeed in school. It is anticipated that studies like this one and subsequent intervention studies to follow can help to enlighten, inform and hopefully initiate the requisite action needed in our schools and in our communities to properly prepare our children to evade the insidious and perpetual temptations that threaten not only their academic futures, but their livelihoods as well.

APPENDIX A
STUDY SURVEYS (3)

There are NO right or wrong answers. Please respond with your true beliefs rather than the way you think you should respond. **FOUR (4) POSSIBLE ANSWERS**

Definitely choose A ***Probably choose A*** ***Probably choose B*** ***Definitely choose B***

1. ***A.*** Go to a favorite concert, play, or sporting event and study less for this course even though it may mean getting a lower grade on an exam you will take tomorrow.

   B. Stay home and study to increase your chances of getting a higher grade.

2. ***A.*** Study a little every day for an exam in this course and spend less time with your friends.

   B. Spend more time with your friends and cram just before the test.

3. ***A.*** Miss several classes to accept an invitation for a very interesting trip.

   B. Delay going on the trip until the course is over.

4. ***A.*** Go to a party the night before a test for this course and study only if you have time

   B. Study first and party only if you have time.

5. ***A.*** Spend most of your time studying just the interesting material in this course even though it may mean not doing so well.

   B. Study all the material that is assigned to increase your chances of doing well in the course.

6. ***A.*** Skip this class when the weather is nice and try to get the notes from somebody later.

   B. Attend class to make certain that you do not miss something even though the weather is nice outside.

7. ***A.*** Stay in the library to make certain that you finish an assignment in this course that is due the next day.

   B. Leave to have fun with your friends and try to complete it when you get home later that night.

8. ***A.*** Study for this course with your friends even if they keep you from concentrating.

   B. Study in a place that is quiet and you are by yourself.

9. ***A.*** Leave right after class to do something you like even though you know you need help.

   B. Stay after class to ask your instructor for help for an exam that you do not understand.

10. ***A.*** Select an instructor for this course who is fun even though he/she does not a good job covering the course material.

    B. Select an instructor for this course who is not as much fun but who does a good job covering the course material.

1. You find out a "friend" was talking about you behind your back.
2. Your friends make fun of you in front of someone else.
3. You try to explain something to your best friend, and they keep interrupting you.
4. Your friend makes plans to meet you after school, but doesn't show up.
5. You are waiting in line for a movie, and someone cuts in front of you.
6. While arguing with your brother (or friend), he pushes you.
7. You tell a good friend a secret, and they tell everyone.
8. During an argument, a friend calls you "stupid".
9. You tell the truth, but your parents don't believe you.
10. You are struggling to carry four large sodas in the cafeteria, and someone knocks over your drinks.
11. Your brother or sister take something that is yours without asking.
12. You are walking down the hall, and a group of people laugh at you.

1	2	3	4	5
Not angry at all	a little angry	fairly angry	very angry	very, very angry

CRAFFT Substance Abuse Screening Test

C **Have you ever ridden in a car driven by someone (including yourself) who has been "high" or has been using alcohol or drugs?**

R **Do you ever use alcohol or drugs to relax; feel better about yourself, or to fit in?**

A **Do you ever use alcohol or drugs while you are by yourself, alone?**

F **Do you ever *forget* things you did while using alcohol or drugs?**

F **Do your family or friends ever tell you that you should cut down on your drinking or drug use?**

T **Have you ever gotten into *trouble* while you were using alcohol or drugs?**

Knight, J., Sherritt, L., Shrier, L., Harris, S., & Chang, G. (2002). Validity of the CRAFFT substance abuse screening test on adolescent clinic patients. ***Arch Pediatric Adolescent Medical, 156*****, 607-614.**

APPENDIX B
PARENTAL & STUDENT CONSENT FORMS

Informed Consent Form
For Parents

Please read this consent document carefully before you decide to allow your child to participate in this study.

You are being asked to allow your child to take part in a University of Central Florida research study. You can ask questions about the research. Your child is being invited to take part in this research study because he or she is a student at ALC West.

What your child will be asked to do in the study:
I am going to ask your child questions about how important it is for them to choose things that may make them feel better *right now* like drugs or acting angry, instead of things that take time and work like your child's grades. The four surveys will be given one at a time on consecutive school days during the lunch period. Mr. Herndon will be responsible for handing out and picking up the surveys.

As a part of the study, I will be looking at the student's FCAT scores, as well as their classroom grades and discipline referrals while at ALC West, which has been authorized by the ALC West principal and the School District of Lee County. Per the Protection of Pupil Rights Amendment (PERPA), parents have the right to review the content of a copy of the survey upon request, which they can obtain from me in person at ALC West after setting an appointment with me by phone.

Voluntary participation:
You should allow your child to take part in this study only because you want to. There is NO penalty for you or your child by taking part in this study, and neither you nor your child will lose any benefits you are normally entitled to. You have the right to stop your child from taking part at any time. Just tell the researcher or a member of the research team that you want your child to stop. You will be told if any new information is learned which may affect your willingness to allow your child to continue taking part in this study.

For those students that use drugs and/or alcohol, help will be made available voluntarily from Southwest Florida Addiction Services (SWFAS), a South Florida group that deals with adolescents with substance abuse issues. You may also seek help and/or guidance from the school counselor, Ms. Miller at (239) 574-1678.

Risks:

There is a slight risk of breach of confidentiality if your child's information or your child's identity is obtained by someone other than Mr. Herndon, but precautions will be taken to prevent this from happening. Your child does not have to answer any questions that make him or her feel uncomfortable. If needed, students may seek help from the school counselor, Ms. Miller at (239) 574-1678. Neither you nor your child will lose any benefits you are normally entitled to if your child skips questions or tasks.

Confidentiality:

Your child's identity will be kept confidential. NO ONE, except for Mr. Herndon, will know your child has participated in this study (including the district office), and NO ONE, including you, the parents, will know how your child answered the questions in this study. For example, your child's name will be kept separate from the information he or she gives, and these two things will be stored in different places.

Your child's information will be assigned a code number. The list connecting your child's name to this number will be kept in a password protected computer. The surveys themselves will be stored under lock and key in Mr. Herndon's room in a designated cabinet separate from the student population until all the necessary information is completely reviewed. A copy of this study's results will be given to the District, but it will be in group format and the individual students will NOT be identified. Your child's name will not be used in any report, so people will not know how your child answered or what your child did.

Benefits:

There are no direct benefits for your child to participate in this study, but indirect benefits include learning more about the process of research.

Compensation or payment:

There is no compensation or other payment to you or your child for your child's part in this study.

Whom to contact if you have questions about the study: Mr. Stephan Herndon at ALC West, Cape Coral, FL. School phone number is (239) 574-1678. UCF Faculty Advisor: Dr. Michele Gregoire Gill - Telephone: 407-823-1771. Fax: 407-823-5144.

Whom to contact about your rights in the study: Questions or concerns about research participants' rights may be directed to the UCF IRB office. The hours are 8:00 am until 5:00 pm, Monday through Friday except on University of Central Florida official holidays. The telephone numbers are (407) 882-2276 and (407) 823-2901.

How to return this consent form to the researcher: Please sign and return this consent form in the enclosed envelope. A second copy is provided for your records. By signing this letter, you give me permission to report your child's responses anonymously in the final manuscript to be submitted to my faculty supervisor as part of my course work.

□ I have read the procedure described above

□ I voluntarily agree for my child to take part in the research

□ I am at least 18 years of age

□ I would like to review the content of the survey *prior* to my child's participation

Your signature indicates your agreement to allow your child to participate in this study.

Thank you for your participation.

_____

Parent Signature

_____

Student Name

Informed Assent Form
For Students

Please read this assent document carefully before you decide to participate in this study.

My name is Mr. Herndon. I am doing a research study and would like to ask you questions about how important it is for you to choose things that may make you feel better *right now* like drugs or acting angry, instead of things that take time and work like your grades. This research is part of my studies at the University of Central Florida.

The four surveys will be given one at a time on consecutive school days during the lunch period. Mr. Herndon will be responsible for handing out and picking up the surveys. As a part of the study, I will be looking at your FCAT scores, as well as classroom grades and discipline referrals while at ALC West, which has been authorized by the ALC West principal and the School District of Lee County.

This will not affect your grade if you decide you don't want to do this. You can stop at any time and you do not have to answer a question if you do not want to. You will not be paid for doing this. You will not get extra credit for doing this. However, for those of you who say that you use drugs and/or alcohol, help will be made available voluntarily from Southwest Florida Addiction Services (SWFAS), a South Florida group that deals with adolescents with substance abuse issues. You may also seek help and/or guidance from the school counselor, Ms. Miller at (239) 574-1678.

NO ONE except Mr. Herndon, will know you have participated in this study (including the district office), and NO ONE, except Mr. Herndon, including your parents, will know how you answered the questions in this study. Your information will be assigned a code number. The list connecting your name to this number will be kept in a password protected computer. The surveys themselves will be stored under lock and key in a designated cabinet in Mr. Herndon's room separate from the student population until all the necessary information is completely reviewed. A copy of this study's results will be given to the District, but it will be in group format and the individual students will NOT be identified. Your name will not be used in any report, so people will not know how you answered or what you did. Any questions, contact me. Mr. Herndon at ALC West, 574-1678 or UCF Faculty Advisor Dr. Michele Gregoire Gill - Telephone: 407-823-1771. Fax: 407-823-5144.

_____ I want to take part in Mr. Herndon's study (Check if yes).

_____ _____

Student's Signature Date

_____

Student's Printed Name

APPENDIX C
RESEARCH APPROVAL LETTERS (2)

THE SCHOOL DISTRICT OF LEE COUNTY
2855 COLONIAL BLVD. ♦ FORT MYERS, FLORIDA 33966-1012 ♦ (239) 334-1102 ♦ WWW.LEESCHOOLS.NET

September 15, 2008

Dear Mr. Herndon,

The District Research Committee has reviewed your study, "The effects of delay of gratification and impulsivity on the academic achievement, substance abuse, and violent behavior of Florida middle and high school alternative students," and approves it with the following conditions:

1) Instructional time is not used for students to complete the surveys.
2) A copy of the results is provided to our office once the study is completed.

Thank you for your interest in conducting research in the school district.

Sincerely,

Richard Itzen, Director
Dept. of Accountability, Research, and Continuous Improvement
(239) 335-1448

ALC WEST

ALTERNATIVE LEARNING CENTER WEST

February 23, 2009

I, Dr. Derrick L. Donnell, Principal of ALC West, have given approval to Mr. Stephan Herndon to conduct the following study, entitled "The effects of delay of gratification and impulsivity on the academic achievement, substance abuse, and violent behavior of Florida middle and high school alternative students", at ALC West under the guidelines set forth by the School District Research Committee of Lee County:

1. I will work with the primary investigator on the study, Mr. J. Stephan Herndon, on the appropriate logistics for the study.

2. The surveys will be completed by the students participating in the study *during* the school day, but not during instructional time.

3. Parents and students will be informed that participation is voluntary and that consent must be obtained in writing.

4. An electronic copy of the results, which will be de-identified and in group format, will be provided to the Dept. of Accountability, Research, and Continuous Improvement when the study is complete.

I will ensure, with the help of Mr. Herndon, that the highest level of protection for the rights of the children participating in the study will be implemented.

Derrick L. Donnell, Ed.D
Principal, ALC West

Derrick L. Donnell, Ed.D. • Principal
Derrickd@leeschools.net

1429 NE 16th Avenue • Cape Coral, Florida 33909
(239) 574-1678 • Fax (239) 574-4751

APPENDIX D
IRB APPROVAL

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **John Herndon**

Date: **April 06, 2010**

Dear Researcher:

On April 6, 2010, the IRB approved the following human participant research until 04/05/2011 inclusive:

Type of Review:	IRB Continuing Review Application Form
Project Title:	The effects of delay of gratification and impulsivity on the academic achievement, substance abuse, and violent behavior of Florida middle and high school (grades 6-12/ages 11-19) alternative students.
Investigator:	John Herndon
IRB Number:	SBE-08-05767
Funding Agency:	None

The Continuing Review Application must be submitted 30days prior to the expiration date for studies that were previously expedited, and 60 days prior to the expiration date for research that was previously reviewed at a convened meeting. Do not make changes to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before obtaining IRB approval. A Modification Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at https://iris.research.ucf.edu .

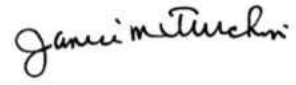
If continuing review approval is not granted before the expiration date of 04/05/2011, approval of this research expires on that date. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

Please note: This study was approved to enroll 245 participants. To date, 365 participants were reported to be enrolled. In the future, please submit an Addendum/Modification Request form to request an increase in enrollment.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Joseph Bielitzki, DVM, UCF IRB Chair, this letter is signed by:

Signature applied by Janice Turchin on 04/06/2010 11:38:47 AM EDT



IRB Coordinator

APPENDIX E
PERMISSION FOR COPYRIGHTED MATERIAL

----- Forwarded Message -----
From: "June P Tangney" <jtangney@gmu.edu>
To: canenvy@embarqmail.com
Sent: Thursday, July 31, 2008 1:11:13 PM GMT -05:00 US/Canada Eastern
Subject: ARI

Hi John,
You are more than welcome to use our measures. I am attaching the ARI adolescent version and scoring information. The scoring document includes information on the development of the ARI and the reliability and validity of the measures. If you need another version (for children or adults) please let us know.
Please do keep in touch and let us know how your research develops. I would be grateful for a summary of the results whenever they become available.
Best Wishes,

June T.

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