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COGNITIVE AUTONOMY IN ADOLESCENCE

by

Ruth A. Thompson

A thesis submitted in partial fulfillment
of the requirement for the degree

of

MASTER OF SCIENCE

in

Family, Consumer, and Human Development

UTAH STATE UNIVERSITY
Logan, Utah

2006

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ABSTRACT

Cognitive Autonomy in Adolescence

by

Ruth A. Thompson, Master of Science

Utah State University, 2006

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Department: Family, Consumer, and Human Development

This study examined the relationship between areas of cognitive autonomy and adolescent development. Differences in cognitive autonomy between age groups were analyzed. Students attending Grades 7, 9, and 11, and college students in Northern Utah participated in this study. Three hundred and ninety-six participants responded to the Cognitive Autonomy and Self-Evaluation (*CASE*) inventory, which examined the subcategories of evaluative thinking, voicing opinions, comparative validation, decision-making, and self-assessment.

Scores were compared by grade and by gender. Results showed that college students scored significantly higher in three of the five areas of cognitive autonomy. Additionally, females in both ninth grade and college scored themselves significantly higher in two areas of cognitive autonomy. Areas of academic grades, time watching television, time spent reading, and weekly computer use were also analyzed. Implications of these findings for future programs and future research are also discussed.

(86 pages)

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Thank you, Dad and Mom, for encouraging me to get this degree in the first place. I will never forget that phone call from Dad encouraging me to continue with my education. I didn't want to do it initially and now I can't think of what I would have done in my life without this degree and all the insight and knowledge I have acquired. Thank you for your support.

Thank you to Dr. Troy Beckert, my major professor, who worked with me through thick and thin and all the statistics in between. By the way, what do Type 1 errors guard against again? I know I should know this but... what test did we run? What is my name? I owe Dr. Beckert a great deal more than I can *ever* repay. For now, I hope my sincerest gratitude for being exactly what I needed in a major professor will somehow be felt.

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Ruth A. Thompson

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CHAPTER I

INTRODUCTION

One of the most important tasks for all adolescents is learning autonomous skills that will help them manage their own lives and make positive, healthy choices.

Autonomy refers to one's growing ability to think, feel, make decisions, and act on his or her own (Russell & Bakken, 2002). Autonomy includes three facets consisting of behavioral, emotional, and cognitive self-government. Each of these areas of autonomy is essential to the development of young people at various points in their maturation. The development of autonomy does not happen at one point in time and can generally occur throughout human development (Steinberg, 1999). Autonomy continues to develop in adulthood whenever someone is challenged to act with a new level of self-reliance. Autonomy during the preteen and teen years holds increased meaning because it signifies that an adolescent is a unique, capable, independent person who depends less on parents and other adults (Steinberg).

One of the first theorists to conceptualize the idea of autonomy was Erik Erikson (Erikson, 1963). According to Erikson, successful resolution of conflicts by mastering self-regulating behaviors such as locomotion, self-feeding, and potty training leads to the behavioral independence of toddlers and young children. Hence, behavioral autonomy involves a capacity to act for one's self and has most often been characterized as a developmental task of toddlerhood (Beckert, 2005).

Beyond the capacity to behave autonomously there exists a motivation to experience emotional independence (Allen, Hauser, O'Connor, & Bell, 2002). As children enter puberty in early adolescence, significant biological, social, and emotional

changes occur. Young people tend to gravitate more toward peer influences rather than parental influence and often seek selective emotional independence from familial influences (Bednar & Fisher, 2003).

Although behavioral and emotional autonomy are important facets of the overall development of autonomy, they often represent an inadequate point of reference for adolescent development. The development of cognitive autonomy is especially important to facilitate development into adulthood. Too often young people make decisions behaviorally (e.g., I am physically able to take this risk) or emotionally (e.g., participating in this risk taking behavior makes me feel good) instead of using independent thought (Beckert, 2005).

This third facet of autonomy, independent thought, has received less attention in research. Adolescence is a time where peer interactions increase (Allen et al., 2002). Often the ability to weigh consequences and make wise decisions escapes young people and momentary pleasure overrides logic. Developing socially among peers is an important aspect in the psychological development of adolescents (Reed & Spicer, 2003). Peers serve as guides in the formation of identity as adolescents begin establishing a sense of self that is separate from the family (Bednar & Fisher, 2003). It is in this identity formation that cognitive autonomy becomes increasingly important. When adolescents are able to consider consequences and react autonomously in interpersonal situations, they are better equipped to evaluate alternatives and avoid adverse risk taking outcomes.

Statement of the Problem

Developmental measures for the construct of cognitive autonomy have been limited. Although many theorists believe cognitive autonomy develops over time in a fashion similar to Piaget's formal operations, no study has been located that has attempted to quantify the development of cognitive autonomy in adolescence with an instrument specifically designed for the construct. To this researchers knowledge, gender differences in the development of cognitive autonomy have not, as of yet, been fully investigated. How school grades, hours spent at home alone, television watching, computer use, and reading affect cognitive autonomy have also been relatively unexplored.

Purpose of the Study

This study uses a cross-sectional descriptive design to compare cognitive autonomy and decision-making beginning in early adolescence to young adulthood. Male and female participants from middle school, high school, and college in Northern Utah were asked to complete a survey consisting of five elements of cognitive autonomy which involved: evaluative thinking, voicing opinions, comparative validation, decision-making, and self-assessing. Age specific comparisons were made from the scores from both male and female respondents and were compared between the five elements of cognitive autonomy. This study sought to identify the development of cognitive autonomy as it related to the participants' scores between grade levels 7, 9, 11, and college students.

CHAPTER II

LITERATURE REVIEW

Overview

This chapter begins with a review of literature in the three areas of autonomy; behavioral, emotional, and cognitive. Next it examines literature on adolescents' ability to use evaluative thinking, voice personal opinions, make decisions, use self-evaluation, and make comparative validations. Additionally, it examines information from applicable studies on the inference that gender, school grades, hours spent at home alone, TV viewing, computer use, and reading have an influence on cognitive autonomy in adolescence. Finally, the problem statement and research questions are introduced.

Autonomy

Autonomy comes from the Latin words "autos" which means "self" and "nomos" meaning "rule." This concept was brought under closer inspection when renowned theorist, Erik Erikson, developed his eight stages of development (1963). Erikson believed that successful completion of the second stage of psychosocial development required a resolution of autonomy versus shame and doubt. Erikson postulated that between the ages of one and three, children begin to master skills of self-governance and assert their independence. Not only do children learn to walk, talk, and feed themselves, but they learn new habits such as toilet training, and so forth. Erikson believed that if children did not successfully complete this stage and were somehow shamed or made to feel inadequate in their independence, a resulting unnecessary dependence upon others,

lack in self-esteem, and doubt in their own abilities would occur. This setback can stifle autonomy. Likewise, if children in this stage are encouraged and supported in their increased independence, they become more confident and secure in their ability to survive in the world, which fosters autonomy (Erikson).

Adolescents can develop autonomy through relationships in their families as well as close friends. Usually, during the preteen and teen years, they begin to have more opportunities to govern their own behavior. Often adolescents spend much of their time outside of direct supervision by adults. As adolescents gravitate more towards their peers and away from adults, it becomes more important for them to develop healthy self-governance, or autonomy, of their behavior (Russell & Bakken, 2002). Three types of self-governance include: behavioral, emotional, and cognitive autonomy.

Behavioral Autonomy

This area of autonomy involves a competence to act for oneself and is related to behaviors. It refers to the ability to make decisions independent from outside influences such as parents or peers, and to follow through on these decisions with actions (Hunter & Youniss, 1982). Behavioral autonomy can also refer to the extent that adolescents demonstrate responsibility for their actions as well as regulate their own behavior and attitudes. True behavioral autonomy necessitates that teens make decisions on their own, rather than following others, such as parents or friends (Popkin, 1993). As teenagers mature in their styles of thinking they often realize that there are many ways to view a situation. When adolescents reach this point, they are able seek out advice from others and weigh the options given to them. They can also begin to consider consequences that

may result from their given decision (Russell & Bakken, 2002). When adolescents rely solely on outside advice, however, they exhibit a lack of autonomy because they are not evaluating their own thoughts and opinions; rather, they are depending on external counsel.

Emotional Autonomy

This area relates to emotions, personal feelings, and how one relates to the people around them. During early adolescence youth shift from depending mainly on parents, to getting an increase of emotional support from peers (Barton, Watkins, & Jarjoura, 1997). Emotional autonomy represents an ability to have feelings that are separate from others feelings. The closer an adolescent comes to achieving emotional autonomy, the more they learn that there are many ways to view a situation. When problems arise, emotionally autonomous teens are more equipped to look for their own solutions rather than solely relying on outside influences (Brody, 2003).

Scales, Benson, Leffert, and Blyth (2000) found that when adolescents begin to exercise their emotional autonomy separate from their parents, they tend to rely more on their peers than their parents. Often emotional autonomy is not as prevalent in the early to middle teenage years. By the late teenage years, adolescents are more self-reliant and do not rely as much on parents or peers (Russell & Bakken, 2002).

Cognitive Autonomy

This area of autonomy has received less attention in research. Cognitive autonomy addresses an individual's ability to have independent attitudes and beliefs and to think for one's self. The development of true cognitive autonomy requires the ability to

evaluate one's thinking, voice opinions, make decisions independently, self-assess, and use comparative validation.

Cognitive autonomy is important in adolescence because it allows teens the opportunity to learn the skills that can help them to manage their own lives and make healthy choices. When positive cognitive autonomy is employed, adolescents are better able to avoid adverse risk taking behaviors that could lead to some undesirable life situations such as teen pregnancy, drug use, alcohol abuse, or juvenile incarceration. Teens often rely on advice from others to make decisions; this advice is generally sought from friends and does not involve autonomous thinking on the adolescents' part. When an adolescent develops cognitive autonomy it gives them the abilities to negotiate and compromise conflicts, express their own opinions, and appreciate differing perspectives from their own (Allen et al., 2002).

The development of cognitive autonomy for adolescents means that the adolescent must take time to consider their personal value systems. If adolescents are able to achieve this, often they are able to come to their own independent conclusions about their values, rather than simply accepting the standards of their friends or values with which they were raised. Consider the following from Lawrence Steinberg (1999):

Although we often use the words autonomy and independence interchangeably, in the study of adolescence they mean slightly different things. Independence generally refers to teens' capacity to behave on their own. The growth of independence is surely a part of becoming autonomous during adolescence, but autonomy means more than behaving independently. It also

means thinking, feeling, and making moral decisions that are truly your own, rather than following along with what others believe. (p. 276)

Gender Differences in Cognitive Autonomy

Fleming (2005) examined how male and female adolescents view autonomy in a large sample of adolescents who were recruited from a pool of 6,829 high school students. She found that general differences start at the 16- to 17-year age bracket. She also found that in late adolescence, boys show a higher rate of achievement of autonomy than girls, and this is associated with a greater frequency of disobedience toward parents among boys.

Some researchers have tried to identify gender differences that occur in adolescence (Bumpus, Crouter, & McHale, in press). They found that for girls in families marked by traditional maternal gender role attitudes, they were granted fewer autonomy opportunities by their parents. Other researchers have found that becoming autonomous was a more self-reported stressful experience for girls than for boys (Beyers & Goossens, 1999; Lamborn & Steinberg, 1993).

Specific Aspects of Cognitive Autonomy

Within the realm of cognitive autonomy there are specific areas that can be examined in its assessment. These include evaluative thinking, voicing opinions, decision-making, self-assessment, and comparative validation. To fully value each facet, a clear understanding of how the components function is necessary.

Evaluative Thinking

Many adults are often surprised at adolescent reasoning and the general lack of evaluation of thoughts that occurs. Hormones have long been characterized as the catalyst for poor evaluation of thoughts. However, neuroscientists now postulate that, in spite of the fact that an adolescent's brain is similar in size to an adult brain, it does not function like an adult brain (Caskey & Ruben, 2003). Researchers who are making use of magnetic resonance imaging analyses show that puberty brings a neural growth spurt in certain areas of the brain, such as the parietal lobes that are the seat of visual/spatial ability (Spano, 2003). Another part of the brain, the temporal lobes that control language and emotion, experiences growth until about the age of 16 (Brown, Tapert, Granholm, & Delis, 2000).

The frontal lobe of the brain that controls planning and judgment remains immature during the period of the adolescent years (Caskey & Ruben, 2003). The prefrontal cortex, which is responsible for complex thinking, organization, working memory, and controlling impulses, is the largest section of the brain and the slowest to develop during adolescence. The adolescent brain is predisposed to use the amygdale, which regulates emotions such as fear, rage, and other "gut" reactions (Giedd et al., 1999).

The very last part of the brain to be pruned and shaped to its adult dimensions is the prefrontal cortex, home of the more executive functions such as – planning, setting priorities, organizing thoughts, suppressing impulses, and weighing the consequences of one's actions. Neuroscientists believe this development does not fully take place until

about the age of 25. In other words, the final part of the brain to grow up is the part capable of deciding, "I'll finish my homework and take out the garbage, and then I'll call my friends about seeing a movie" (Wallis, 2004, pg. 56).

Adolescents' ability to evaluate consequences often seems to be lacking when making decisions. In one prominent study, Bauman (1980) asked teens how likely each of 54 possible consequences would be if they used marijuana, as well as how attractive (or unattractive) each would be if it did occur. Bauman found that the most important positive consequences of marijuana use were ones bringing direct and immediate physical or psychological satisfaction. Consequences that had low probability were ones like "being more liked by friends" or "feeling closer to others."

Examination of adolescents' ability to predict the consequences of risk-taking behavior from different components of their thought evaluation processes found that adolescents who participated in a risky activity perceived the risks to be smaller, better known, and more controllable than did non-participants. Participants also perceived greater benefits relative to risks, greater peer pressure to engage in the activity, and a higher rate of participation by others (e.g., Bentin, Slovic, & Severson, 1993; Morrison, 1985; Namerow, Lawton, & Philliber, 1987; Phelps, 1987). Other investigators, (e.g., Kegeles, Adler, & Irwin, 1989) have examined how adolescents view the utility (or disutility) of those consequences and the trade-offs required when one cannot have everything. Such studies found that adolescents need encouragement from parents and authority figures that focus on the adolescents' beliefs that will encourage or inhibit things like the use of condoms, risk taking behaviors (Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Quadrel, 1993). However, to the researchers knowledge, how

cognitive autonomy relates to other potentially important aspects of independent thought like evaluative thinking in adolescence, or how considering consequences differs by gender, has been relatively unexplored.

Voicing Opinions

Voicing opinions is one aspect of communication that is important for adolescents' successful interactions with their peers as well as with significant adults like teachers and parents (Reed, McLeod, & McAllister, 1999). Problems in conforming to peers' expectations for communication can put adolescents at risk of being ostracized by their peers at a time when peer acceptance is particularly important (Reed et al.). Cartledge, Frew, and Zaharias (1985) found that when adolescents communicate with adults or peers, their willingness to voice opinions may vary. When they are able to develop healthy relationships with peers and significant adults, it can help in the facilitation of their social growth and identity formation. This growth can often contribute support and encouragement to adolescents during a stage when parental ties are loosening, and can help to give more positive models for later adult relationships.

The ability to communicate and voice opinions in an appropriate way helps to influence other people's perceptions and can contribute to the overall satisfaction in interpersonal relationships. In most societies, people's perceptions of an individual's success, maturity, intelligence, and/or social competence are often associated with the person's ability to verbalize opinions and communicate them well (Reed & Spicer, 2003). More specifically, the ability to communicate appropriately and competently in various social situations is an important aspect of social competence. This skill involves adapting

one's communication style to the norms and expectations of the perspective surrounding what is being communicated while still maintaining one's true point of view (Rice, 1993).

Voicing one's opinion in adolescence, whether in a classroom situation, with family, or in front of peers, can induce fears of numerous reactions such as rejection or laughter. When adolescents are able to have quality peer relationships where voicing one's opinion is fostered, it can have a strong impact on their psychological adjustment, academic performance, cognitive development, and social adjustment (Reed et al., 1999).

How well people communicate can affect how they are perceived by others (Cartledge et al., 1985). Reed et al. (1999) postulated that when adolescents are able to adapt their opinions and communication characteristics to fit different conversations, they begin to influence what people think about them and how successful their interpersonal relationships are. For adolescents to deal successfully in different social situations that involve communication, it requires that they adopt an appropriate perspective before voicing their opinions. Adolescents' ability to understand how important different communication skills are for different situations can affect their ability to voice appropriate opinions in given situations (Cartledge et al.).

Reed et al. (1999) found that literature on gender differences in communication suggests that the language of females tends to be characterized more by features of interpersonal support, inclusiveness, compliance, acquiescence, and social acceptability, whereas the language of males tends to have more features of dominance and assertion, control, posturing, directiveness, and use of factual content (e.g., Barron, 1971; Craig & Evans, 1991; Gal, 1989; Goodwin, 1980; Hass, 1981; Maltz &orker, 1982). However,

it is possible that other research findings, such as those of Macaulay (1978) and Craig and Evans (1991), which suggest that male and female communication is more similar than dissimilar, more accurately reflects the associations between gender and communication.

Decision-Making

Decision-making is the process of choosing what to do in a given situation by considering the various consequences that could result from different choices (Fischhoff, Crowell, & Kipke, 1999). Reasoning skills are used in the decision-making process and involve the ability to judge probability, think analytically, or consider ideas in the abstract. The process that occurs for adolescents when making decisions can range from listing important choices, identifying the potential consequences of each choice, judging the likelihood of each consequence actually occurring, determining the importance of these consequences, and combining all this information to decide which choice is the most appealing (Ganzel, 1999).

There are many factors that may influence adolescent decision-making, one of which is the mental process of reasoning and perception. These decision-making processes mature with age and experience and are influenced by an adolescent's brain development and acquisition of knowledge. Before this acquisition of knowledge is gained, adolescents often encounter a myriad of road blocks when faced with a decision. Fischhoff et al. (1999) asserted that adolescents perceive many of these dilemmas in an either-or choice, rather than perceiving multiple options. Sometimes adolescents also misperceive certain choices as less risky and could then be overly optimistic about their

ability to recognize and avoid threatening situations. Elkind (1967) postulated that occasionally adolescents decide to discover consequences for themselves, rather than consider probabilistic evidences of their actions. Adolescents also tend to focus more on the positive social reactions of their peers when faced with risk-taking activities, rather than the negative consequences that might follow.

Decision-making is important for adolescents. The issue of decision-making becomes increasingly important during this time of growth because teens are developing greater autonomy and encountering more choices independent of adults. Choices that teens make may drastically affect not only their own lives, but the lives of others as well (Laskey & Campbell, 1991). Some of the decisions adolescents may have to face are unimportant, and their consequences not likely to be costly (e.g., which friend to call, how to wear the latest fashion, or what to text message next). Other decisions, however, can have monumental, life-shaping consequences (Schvaneveldt & Adams, 2001). These include marriage, parenthood, educational pursuits, and career choices. Other detrimental choices might include whether to engage in unprotected sex, whether or not to use narcotics, stimulants, cigarettes, and so forth. Still other decisions include whether to stay in school, pursue a college degree or get a job, which career path to pursue, or whether or not to engage in violent or risky behaviors.

Schvaneveldt and Adams (2001) hypothesized that males, when given a dilemma, are more likely to plan out their options in order to make a decision, whereas females are more likely to use an intuitive approach and go with their "gut" in their decision-making. However, to this researcher's knowledge, studies comparing male and female adolescents

on their decision strategies and use of cognitive autonomy have been relatively unexplored.

Self-Assessing

The ability to self-assess or self-evaluate is often over generalized to encompass the ability to ascertain or judge one's individual worth. However, self-assessment generally involves an estimate of personal qualities and competencies – generally how good or bad individuals feel about themselves and their strengths and weaknesses. Therefore, self-assessment is a term best used to describe individuals' beliefs that they are competent within specific domains, such as cognitive or academic domains, physical ability and attractiveness domains, peer and family social domains, and behavioral domains (Bridges, Margie, & Zaff, 2001) or at a specific task or project.

Self-assessment is an important facet in cognitive autonomy. When adolescents have an accurate self-evaluation of their learning capacity, for example, the more positive their feelings towards attending school may be, and the higher attending school is valued as a goal. As a result, the adolescent may invest more in school and have better academic achievement (Peetsma, Hascher, & Van Der Veen Ewoud Roede, 2005).

Bandura (1995) stated:

When an adolescent utilizes self-assessment they are practicing efficacy beliefs that are context-specific through evaluations of the capability to successfully complete a task, and are formed through mastery experiences, vicarious experiences (observation of others), social/verbal persuasion, and interpretations of physiological and emotional states. (p. 104)

It is these efficacy beliefs that can contribute to prediction of academic outcomes beyond the contributions offered by ability, previous attainments, knowledge, and skill alone (Klassen, 2002). Adolescents need more than ability and skills in order to perform successfully; they also need the ability to self-assess in order to use those skills well and also regulate their learning (Bandura, 1995).

The ability for adolescents to self-assess their skills is important toward development of autonomous thinking. It is important for adolescents to personally determine where their aptitudes lie rather than to depend on others to decide for them. That is not to say that they should use self-assessment in a vacuum. Individuals who are effective at self-evaluation, process feedback from trusted advisors to arrive at their own conclusions.

Most studies emphasizing self-assessment tend to measure the relationship between self-esteem and academic results (e.g., Alves-Martins, Peixoto, Gouveia-Pereira, Amaral, & Pedro, 2002; Peetsma et al., 2005). Some studies have indicated that academic results play an important role in the self-esteem of younger adolescents (Hair & Graziano, 2003; Peetsma et al.) whereas Alves-Martins and colleagues show that adolescents manage to maintain their self-esteem at acceptable levels despite poor academic performance. While these types of studies are important, it might be interesting to determine an adolescent's self-identified status in regard to self-assessment.

Researchers have found that the ability to self-assess during the adolescent years is a process. Scholars who have used longitudinal studies of adolescent self-assessment have shown a decline in the ability to self-assess at age 11, a low between ages 12 and 13, and then gradual, systematic improvements in self-assessment through age 18 (Quatman,

& Watson, 2001; Rosenberg, 1981). One consistent finding is that boys generally have higher scores than girls in their ability to evaluate their strengths, abilities, and talents (Quatman & Watson).

The relationship between gender and self-evaluation in adolescence, while modest, has been well established (see Bolognini, Plancherel, Bettschart, & Halfon, 1996; Brage & Meredith, 1994). This drop off in the early teen years is consistent with the previously reviewed literature on brain development.

O'Brien et al. (1996) pointed out that the necessary next step in understanding gender differences in self-assessment would be studies of specific facets or domains of self-esteem, as larger gender effects may well exist but may be obscured within global inventories. Harter (1982) confirmed a growing consensus that self-esteem is poorly captured by a single measure that combines evaluations between multiple domains, masking important distinctions that individuals make about their ability to self-assess in the different domains of their lives (Quatman & Watson, 2001). To the researchers knowledge, as of yet, adolescents ability to self-assess has not been researched within the construct of cognitive autonomy.

Comparative Validation

Theorists have speculated that one dramatic adolescent transition that often takes place is that of being parent-oriented to being peer-oriented (Bednar & Fisher, 2003). Those adolescents who decide to follow peers opinions may do so because of the perceived benefits or because of what they believe they might lose by not doing so (Britain, 1963). Adolescents commonly feel that the time they spend with their peers is

the most enjoyable because it generally consists of activities that are interesting, whereas the time spent with their family often consists of responsibilities and regulations.

The peer group in adolescence can become very important in the psychological development of adolescents. Often it can serve as a guide in the formation of identity as adolescents begin to establish a sense of self that is separate from the family (Brown, Clasen, & Eicher, 1986). This act often initiates the practice of thinking abstractly and using complex reasoning when weighing the opinion of others.

Peer influence is usually most persuasive during early adolescence. Often peers can influence each other because they (a) have coercive power and can punish others' noncompliance, (b) reward power and can generally control the outcomes of others' desires, and (c) referent power that causes others to admire them and desire to be like them (Bednar et al., 2003). These unseen pressures often compel adolescents when weighing peer opinions and considering consequences.

Lewis (1981) examined differences in the adolescents' ability to use comparative validation among three grade-level groups (7th, 8th, 10th, and 12th). She found no significant evidence indicating that boys are willing to take greater risks when using comparative validation than girls. Geary and Boykin (1996) found that adolescents whose parents encourage autonomy in their children are likely to raise teens that are capable of independent thought and decisions. She also found that not all peer influence is negative and that teens are more likely to follow peer influence toward positive or neutral behaviors than they are to follow influence toward misconduct. Relatively little information is available concerning adolescents' ability to use comparative validation

however, and no studies investigating cognitive autonomy in connection with comparative validation and gender have been identified.

Potential Influences on Cognitive Autonomy

Differences in Autonomy over Time

When adolescents mature they experience many changes physically, as well as emotionally, behaviorally, and cognitively. Research examining the differences in cognitive autonomy between age groups, to this researcher's knowledge, has not been done. Likewise, the potential difference as outlined in the literature above, to this researcher's knowledge, has not been examined as it relates to these areas of cognitive autonomy.

Areas of cognitive autonomy that have been researched in correlation with school grades include: the effects on school performance of IQ, race, grade in school, sex of teacher, and sex of student in correlation with gender identity (see Burke, 1989). Research examining the influence that autonomy has on school grades has, to this researcher's knowledge, not yet been fully explored. Although Montemayor (1982) examined the effect that hours spent at home alone has upon adolescent delinquency, the type of conflicts adolescents have with parents, and involvement with parents and peers in how they are interrelated, there is no literature available discussing the connection of time spent at home alone and the impact it has on cognitive autonomy in adolescence.

Given the rate of media consumption by adolescents it might be possible that the amount and type of media can influence self-perceptions of cognitive autonomy. While this area of research remains relatively new, some current literature provides a rationale

for the inquiry. Giles and Maltby (2004) researched the effect the transition from parental attachment to peer attachments would have in relation to emotional autonomy and found that high emotional autonomy was a significant predictor of celebrity interest, as well as high attachment to peers and low attachment to parents. Another study done by Arnett (2005) found that there is often a lack of integration in the socialization of adolescents, in the sense that they may receive different socialization messages from media (and peers) than they do from the adults in their immediate environment. Studies examining the connection between hours of television watched and cognitive autonomy, however, have not been conducted.

Research conducted examined the impact of home computer use on child and adolescent development (Subrahmanyam, Greenfield, Kraut, & Gross, 2001) found that teenagers use the computer more than younger children or adults. They also found that use is greater for boys compared to girls, for Whites compared to Black or Hispanic children, and for children in households with higher parental income and education. This study found that adolescents spend more time watching television than using computers, although computer users watch less television than non-computer users. Another study done by Orleans and Laney (2000) found that the interpersonal lives and computer activities of children involuntarily improved each other and that boys were more likely to socialize via computers than were girls. Aside from this research and to this researcher's knowledge, there have been no studies conducted correlating the effect that computer use has on cognitive autonomy in adolescence.

A study conducted by Zimmerman, Bandura, and Martinez-Pons (1992) found that student's beliefs in their ability to regulate their personal learning affected their

perceived ability for academic achievement, which in turn influenced the academic goals they set for themselves and their final academic achievement. These findings are consistent because academic achievement is synonymous with reading the text given for the specific class being taught. To the researcher's knowledge, as of yet, no studies have examined the correlation between time spent reading and cognitive autonomy in adolescence.

Summary

Based on this review of literature, the following conclusions have been drawn:

1. The development of cognitive autonomy measures has been limited. While research on cognitive autonomy is available, the uniqueness of the construct has not been explored.
2. Although many believe cognitive autonomy develops over time in a similar fashion to Piaget's formal operations, no study has attempted to quantify the changes in cognitive autonomy at differing ages with an instrument specifically designed for the construct.
3. Cognitive autonomy includes many facets. Five areas of cognitive autonomy that have received some attention in the literature and therefore merit further exploration include evaluative thinking, voicing opinions, comparative validation, decision-making, and self-assessment.
4. Like other developmental constructs, variability between adolescents on cognitive autonomy is expected. The influences of gender, school grades, and family life and media consumption may represent potential areas that contribute to differences.

The current study examined the differences of cognitive autonomy which include evaluative thinking, voicing opinions, comparative validation, decision-making, and self-assessment in adolescents. The following questions will guide the research and will serve as a guide to analysis.

Research Questions

1. Are there significant differences in cognitive autonomy between adolescents in grades 7, 9, 11, and college students?
2. Are there significant differences in cognitive autonomy based on gender between male and female adolescents for each age group?
3. How do the participants' school grades, hours spent at home alone, TV watching, computer usage, and reading relate to cognitive autonomy?

CHAPTER III

RESEARCH METHODOLOGY

This study quantitatively evaluated data provided from responses to the Cognitive Autonomy and Self-Evaluation (*CASE*) inventory. After a description of the research design and sampling method, this chapter presents the measurement and data analyses.

Research Design

A cross-sectional, descriptive design was used for this study to assess how adolescent scores differ on the *CASE* between Grades 7, 9, 11, and college students; how scores differ based on gender; and how areas of cognitive autonomy related to (a) school grades, (b) hours spent at home alone, (c) hours spent watching television, (d) use of the computer, and (e) reading. This present study was based on responses from adolescents and young adults attending junior high, high school, and college in Northern Utah.

Sample

This study used a convenience sample. All participants were attending junior high school, senior high school, or college in Logan, Utah. Logan is agriculturally based with a population of approximately 80,000. As seen in Table 1, participants in this study consisted of predominantly white (78%) students (male (50%) and female (50%)) from Grades 7, 9, 11, and college students, who provided perceptions about themselves and their ability to think autonomously.

Table 1

Frequencies and Percentages of Junior High, High School, and College Participants Representing Each Demographic Category

Identification variables	7 th		9 th		11 th		College students (n = 127)	
	(n = 128)		(n = 70)		(n = 71)			
Gender	Freq	%	Freq	%	Freq	%	Freq	%
Male	67	52.3%	37	52.9%	38	53.5%	56	44.1%
Female	61	47.7%	33	47.1%	33	46.5%	71	55.9%
Age								
11-12 years	47	36.7%	0	0.0%	0	0.0%	0	0.0%
13-14 years	80	62.5%	52	74.3%	0	0.0%	0	0.0%
15-16 years	0	0.0%	18	25.7%	51	71.8%	0	0.0%
17-18 years	0	0.0%	0	0.0%	19	26.8%	19	15.0%
19-20 years	0	0.0%	0	0.0%	0	0.0%	73	57.5%
21 + years	0	0.0%	0	0.0%	0	0.0%	34	26.7%
Missing	1	0.8%	0	0.0%	1	1.4%	1	0.8%

(table continues)

Identification variables	7 th (n = 128)		9 th (n = 70)		11 th (n = 71)		College students (n = 127)	
Ethnicity								
White	92	71.9%	55	78.6%	51	71.8%	113	89.0%
Black	2	1.6%	1	1.4%	0	0.0%	1	0.8%
Hispanic	20	15.6%	13	18.6%	10	14.1%	9	7.1%
Other	13	10.2%	1	1.4%	10	14.1%	4	3.1%
Missing	1	0.7%	0	0.0%	0	0.0%	0	0.0%
School grades								
Above Average	60	46.9%	33	47.1%	24	33.8%	70	55.1%
Average	50	39.1%	29	41.4%	40	56.3%	53	41.7%
Below Average	17	13.3%	6	8.6%	6	8.5%	4	3.2%
Missing	1	0.7%	2	2.9%	1	1.4%	0	0.0%
Time spent alone after school								
None	43	33.6%	18	25.7%	19	26.8%	N/A	
1-2 hours	54	42.2%	37	52.9%	44	62.0%	N/A	
3 or more	30	23.4%	14	20.0%	8	11.2%	N/A	
Missing	1	0.8%	1	1.4%	0	0.0%	N/A	

(table continues)

Identification variables	7 th (<i>n</i> = 128)		9 th (<i>n</i> = 70)		11 th (<i>n</i> = 71)		College students (<i>n</i> = 127)	
TV watching time per week								
0-3 hour	58	45.3%	35	50.0%	33	46.5%	N/A	
3-6 hours	37	28.9%	21	30.0%	24	33.8%	N/A	
6 or more	33	25.8%	14	20.0%	14	19.7%	N/A	
Reading time per week								
None	12	9.4%	10	14.3%	8	11.3%	2	1.6%
1-3 hours	46	35.9%	31	44.3%	43	60.6%	40	31.5%
3-6 hours	44	34.4%	10	14.3%	13	18.3%	39	30.7%
6 or more	26	20.3%	19	27.1%	7	9.8%	46	36.2%
Computer time per week								
None	15	11.7%	8	11.4%	11	15.5%	2	1.6%
1-3 hours	59	46.1%	32	45.7%	33	46.5%	10	7.9%
3-6 hours	32	25.0%	16	22.9%	19	26.8%	58	45.7%
6 or more	22	17.2%	14	20.0%	8	11.2%	57	44.9%

Procedures

Prior to the initiation of the study, the intent of the research, the methods of acquiring a sample, and letter of informed consent were reviewed by the Utah State

University Institutional Review Board (IRB) for use of human subjects. After obtaining IRB approval, a survey questionnaire (*CASE*) inventory was distributed to participants in the 7th, 9th, and 11th grades as well as college students.

Anonymity

Anonymity was maintained by ensuring that no names were requested on the surveys returned to the researchers and as such, there would be no means by which the researchers would be able to connect names with data. The data used for the thesis were also group analyzed and individual surveys were locked down following data entry.

Data Collection

Data collection for this study proceeded in two phases. The first phase of collection took place in fall of 2005 and included participants from 9th and 11th grades. The second phase took place in the spring of 2006 for the 7th grade and college students. Below is a brief explanation of the data collection method employed for all participants.

For participants that were not yet adult status, parents received a letter (see Appendix A) from the principal of the junior high or high school their child attended. The letter explained that the goal of the research project was to seek to understand the way adolescents think independently. Student participation was voluntary so the parents were encouraged to contact the principal if they had concerns. The parents were informed that the name of their child would not be solicited and therefore their responses would remain confidential and anonymous. Parents who did not wish for their child to participate in the survey were instructed to inform their child to abstain without penalty. Directions were

provided to students by the teacher when the *CASE* was administered at school.

Assistance was provided by the teacher or researcher to students having difficulty completing the instrument. Assistance included clarifying instructions, providing additional definitions of terms, and verification of complete surveys.

Measurement

Instrumentation

The purpose of the Cognitive Autonomy and Self-Evaluation (*CASE*) inventory is to allow adolescents to self-describe areas of independent thinking (see Appendix B). It also offers researchers interested in adolescence more information on how adolescents consider and evaluate their thinking, voice opinions, make decisions, self-assess, and use comparative validation. This researcher gathered responses between four grade levels (7, 9, 11, and college students) and assessed the difference in scores between grade level in five autonomous areas of cognition (Evaluative Thinking, Voicing Opinions, Decision-making, Self-Assessment and Comparative Validation), as measured by the *CASE* inventory. Response ratio was approximately 96%.

Inventory Description

The *CASE* questionnaire addressed the following areas of cognitive autonomy: (a) participants ability to use evaluative thinking, (b) participants ability to voice opinions, (c) participants ability to make decisions, (d) participants ability to self-assess, and (e) participants ability to use comparative validation. Demographic questions addressed the following areas: gender, ethnicity, school grades, hours spent home alone each weekday, hours spent watching TV per week, hours spent on the computer each week, and hours

spent reading per week. The inventory consists of 27 Likert-type items. Always, Often, Sometimes, Seldom, and Never, or Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree are the option choices. The *CASE* measures five distinct areas of autonomous thought including:

1. Adolescents' ability to use evaluative thinking -- ability to consider alternatives and consequences: (a) I consider alternatives before making decisions; (b) I think about the consequences of my decisions; (c) I look at every situation from other people's perspectives before making my own judgments; (d) I think of all possible risks before acting on a situation; (e) I think about how my actions will affect others; (f) I think about how my actions will affect me in the long run; (g) I like to evaluate my daily actions; (h) I like to evaluate my thoughts.

2. Adolescent's ability to voice opinions -- ability to offer opinions freely when necessary: (a) If I have something to add to a class discussion I speak up; (b) When I disagree with others I share my views; (c) I stand up for what I think is right regardless of the situation; (d) I feel that my opinions are valuable enough to share; (e) At school I keep my opinions to myself.

3. Adolescent's decision-making -- ability to make decisions: (a) My decision-making ability has improved with age; (b) I am better at decision-making than my friends; (c) There are consequences to my decisions; (d) I think more about the future today than I did when I was younger; (e) I can tell that my way of thinking has improved with age; (f) I am good at evaluating my feelings.

4. Adolescent's ability to self-assess -- ability to identify personal strengths and abilities: (a) I am good at identifying my own strengths; (b) I am best at identifying my abilities; (c) I am the best judge of my talents.

5. Adolescents ability to utilize comparative validation – the role of consultants in decision-making: (a) I need family members to approve my decisions; (b) I need my views to match those of my parents; (c) It is important to me that my friends approve of my decisions; (d) I need my views to match those of my friends; (e) I care about what others think of me.

CASE Scoring

Each of the responses to the 27 items are assigned a numerical value of either 5, 4, 3, 2, or 1. Values of 5 indicates the higher response with diminishing values for other response options from four to the lowest response option of one, indicating least favorable. On the *CASE* inventory, all scales were worded positively except for one question in the scale of voicing opinions as well as the entire comparative validation scale. An example of a positively worded question is, "I like to evaluate my thoughts." An example of a negatively worded question is, "I need my views to match those of my friends."

Validity and Reliability

Validity of scores on the *CASE* has been established (Beckert, 2006). Responses were factor analyzed by item and subscale. Analysis with principal components and principal factor solutions followed by a varimax orthogonal rotation resulted in eigenvalues of 1.0 or greater for five factors making a "best fit." For the high school

populations subscale factor loadings indicated that of the 27 items, all 27 loaded significantly on the expected subscales.

Reliability Cronbach's alpha coefficients attained through analysis of responses from high school students in Northern Utah (Beckert, 2006) for the scales ranged from .64 to .87. Alpha coefficients for the present study are presented in the next chapter.

Data Analysis

To address the three research questions of this study, data analyses were completed through the use of the Statistical Package for the Social Sciences (SPSS version 14.0) for windows. Because of the type of analyses chosen for this study, Type I errors were controlled by specifying an alpha level set at .01 a priori. Research questions focused on differences and associations addressed in connection with evaluative thinking, voicing opinions, comparative validation, decision-making, and self-assessment.

The dependent variables for this study were subscale scores on the *CASE* inventory. Independent variables included: gender, year in school (7/9/11/college students), participant's self-reported grades (above average/average or below average), hours spent watching TV per week (0-3/3-6/more than 6), hours spent reading per week (0-3/3-6/more than 6), hours spent on computer per week (0-3/3-6/more than 6), and hours spent home alone each weekday (none/1-2/3 or more).

CHAPTER IV

RESULTS

The results of the Cognitive Autonomy Self Evaluation (*CASE*) inventory for the groups of 7th graders ($n = 128$), 9th graders ($n = 70$), 11th graders ($n = 71$), and college students ($n = 127$) are outlined in this chapter. Descriptive and inferential analyses were performed. The five subscales of the *CASE* inventory which included areas of evaluative thinking, voicing opinions, comparative validation, decision-making, and self-assessing were used as dependent variables. The content of these subscales constitute areas of cognitive autonomy and self evaluation. The total instrument, therefore, included 27 items. Independent variables under consideration in this study included gender, year in school (7/9/11/college students), participant's self-reported grades (above average/average or below average), hours spent watching TV per week (0-3/3-6/more than 6), hours spent reading per week (0-3/3-6/more than 6), hours spent on computer per week (0-3/3-6/more than 6), and hours spent home alone each weekday (none/1-2/3 or more).

Cronbach's alpha reliability coefficients were used to assess the internal consistency of responses on each scale of the *CASE* Inventory. The scores from each respondent group were analyzed for each of the scales of the instrument. In this study, the respondent scores yielded sound reliability results for most of the scales. As seen in Table 2, the only scale that produced undesirable alpha scores was the decision-making scale for college students ($\alpha = .34$). All of the other respondent groups had favorable alpha scores (Henson, 2001) for each scale ranging from .89 to .60.

Analyses for this study proceeded according to the research questions outlined in chapter two. For each research question, the results of analyses are presented below.

Grade Level Differences

Research question one asked how scores on the *CASE* inventory differed for adolescents in the 7th grade, 9th grade, 11th grade, and early college years. Table 3 shows the effect of the participants' grade level for each scale and how the scores on the *CASE* inventory differed for adolescent respondents.

A significant difference was found in evaluative thinking subscale $F(3, 392) = 9.49, p = .00$, comparative validation $F(3, 392) = 3.80, p = .01$, and decision-making $F(3, 392) = 7.74, p = .00$.

Table 2

Cronbach's Alpha Coefficients for Student Responses by Scale for CASE

<i>Inventory</i>					
Scale	Number of Items	7 th (<i>n</i> = 128)	9 th (<i>n</i> = 70)	11 th (<i>n</i> = 71)	College students (<i>n</i> = 127)
Evaluative thinking	8	0.86	0.89	0.84	0.81
Voicing opinions	5	0.76	0.77	0.83	0.79
Comparative validation	5	0.64	0.64	0.60	0.75
Decision-making	5	0.68	0.80	0.73	0.34
Self-assessing	3	0.73	0.81	0.63	0.74

Table 3

Mean Scores and Standard Deviations for Each Grade Level with Significant

Differences Between Respondent Groups

Scale	7 th (<i>n</i> = 128)		9 th (<i>n</i> = 70)		11 th (<i>n</i> = 71)		College students (<i>n</i> = 127)		<i>F</i> Ratio <i>df</i> (3,392)	<i>F</i> Prob
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Evaluative thinking	3.41	0.74	3.24	0.74	3.35	0.65	3.70	0.50	9.49	0.00
Voicing opinions	3.49	0.72	3.46	0.69	3.58	0.76	3.48	0.62	0.41	0.75
Comparative validation	2.88	0.65	2.94	0.62	3.17	0.62	3.04	0.63	3.80	0.01
Decision-making	3.88	0.54	3.87	0.62	4.04	0.49	4.16	0.48	7.74	0.00
Self-assessing	3.71	0.79	3.62	0.78	3.54	0.63	3.56	0.63	1.30	0.28

In evaluative thinking, college students ($M = 3.70$, $SD = .50$) rated themselves significantly higher than 7th ($M = 3.41$, $SD = .74$), 9th ($M = 3.24$, $SD = .74$), and 11th graders ($M = 3.35$, $SD = .65$) and decision-making ($M = 4.16$, $SD = .48$). In the area of comparative validation, 11th graders ($M = 3.17$, $SD = .62$) rated themselves significantly higher than 7th ($M = 2.88$, $SD = .65$), 9th ($M = 2.94$, $SD = .62$), and college students ($M = 3.04$, $SD = .63$).

Gender Differences

In response to question two, which asked the impact of gender on respondent scores on the *CASE* inventory, Table 4 shows the mean scores and standard deviations by gender for ninth-grade respondents. Each grade was analyzed separately to avoid

masking gender differences between grade levels. The analysis of variance for 7th and 11th grade and college respondents indicated that the participants' gender was not statistically significant on any of the *CASE* scales. Table 4 shows the effect of the participants' gender with ninth-grade participants. For ninth-grade students, evaluative thinking, $F(1, 68) = 5.13, p = .03$, and decision-making, $F(1, 68) = 4.92, p = .03$, both showed a significant difference between genders. In each case, females rated themselves higher than males in their ability to use evaluative thinking ($M = 3.53, SD = .60$) and make decisions ($M = 3.84, SD = .51$).

Independent Variables

In response to question three, Tables 5 through 15 highlight the mean scores and standard deviations for participants school grades, hours spent at home alone, TV, computer, and reading for participants.

Academic Grades

Table 5 shows the effect of seventh-grade participants' self-reported academic grades (Above average/ Average or below) for each scale. A significant difference was found in the young adolescents ability to use evaluative thinking, $F(1,125) = 23.39, p = .00$, voice opinions, $F(1,125) = 13.62, p = .00$, make decisions, $F(1,125) = 13.91, p = .00$, and use self-assessment, $F(1,125) = 15.53, p = .00$.

In each case, seventh graders who rated themselves as being above average students also rated themselves higher in these areas of cognitive autonomy. Most notably the seventh-grade respondents with above average grades felt most confident in their

Table 4

Mean Scores and Standard Deviations for Each Gender for 9th Grade with Significant Differences Between Respondent Groups

Scale	Male (n = 37)		Female (n = 33)		F Ratio df (1,68)	F Prob
	M	SD	M	SD		
Evaluative thinking	3.05	0.79	3.44	0.63	5.13	0.03
Voicing opinions	3.35	0.65	3.58	0.72	1.98	0.16
Comparative validation	2.98	0.64	2.90	0.59	0.26	0.61
Decision-making	3.72	0.71	4.04	0.47	4.92	0.03
Self-assessing	3.62	0.73	3.63	0.84	0.00	0.98

Table 5

ANOVA for 7th Grade Self-Reported Academic Grades for CASE Scales

Scales	Above Average (n = 60)		Average or Below (n = 67)		F Ratio df (1,125)	F Prob
	M	SD	M	SD		
Evaluative thinking	3.71	.56	3.12	.79	23.39	0.00
Voicing opinions	3.72	.68	3.27	.69	13.62	0.00
Comparative validation	2.85	.59	2.89	.70	0.12	0.72
Decision-making	4.05	.50	3.71	.53	13.91	0.00
Self-assessing	3.99	.77	3.46	.73	15.53	0.00

decision-making abilities (Above Average $M = 4.05$, $SD = .50$; Average or Below $M = 3.71$, $SD = .53$).

Table 6 shows the effect of ninth-grade participants' self-reported academic grades for each scale. A significant difference was found ($F(1,66) = 7.40$, $p = .00$) in the area of voicing opinions with students who assigned themselves above average grades ($M = 3.69$, $SD = .64$) assigning themselves higher scores in their willingness to voice their opinion compared to students who received average or below average grades ($M = 3.25$, $SD = .69$).

Table 7 shows the effect of eleventh-grade participants' self-reported academic grades for each scale. No statistically significant differences were found on any of the

Table 6

ANOVA for 9th Grade Self-Reported Academic Grades for CASE Scales

Scales	Above Average ($n = 33$)		Average or Below ($n = 35$)		<i>F</i> Ratio <i>df</i> (1,66)	<i>F</i> Prob
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Evaluative thinking	3.35	.80	3.14	.67	1.46	0.23
Voicing opinions	3.69	.64	3.25	.69	7.40	0.00
Comparative validation	2.99	.63	2.91	.63	0.28	0.60
Decision-making	4.03	.49	3.74	.70	3.70	0.06
Self-assessing	3.62	.73	3.62	.83	0.00	0.99

CASE scales. An area that approached significance was $F(1,125) = 4.04, p = .05$ in the area of evaluative thinking with students who assigned themselves above average grades ($M = 3.55, SD = .56$) assigning themselves higher scores in their ability to evaluate their thinking compared to students who received average or below average grades ($M = 3.23, SD = .67$). Another area that approached significant was $F(1,125) = 4.18, p = .05$ in the area of decision-making with students who assigned themselves above average grades ($M = 4.19, SD = .46$) assigning themselves higher scores in their ability to make decisions compared to students who received average or below average grades ($M = 3.95, SD = .49$).

Table 7

ANOVA for 11th Grade Self-Reported Academic Grades for CASE Scales

Scales	Above Average (<i>n</i> = 24)		Average or Below (<i>n</i> = 46)		<i>F</i> Ratio <i>df</i> (1,125)	<i>F</i> Prob
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Evaluative thinking	3.55	.56	3.23	.67	4.04	0.05
Voicing opinions	3.77	.73	3.47	.77	2.50	0.12
Comparative validation	3.11	.48	3.22	.68	0.49	0.49
Decision-making	4.19	.46	3.95	.49	4.18	0.05
Self-assessing	3.57	.59	3.51	.66	0.10	0.75

Table 8

ANOVA for College Students Grade Self-Reported Academic Grades for CASE Scales

Scales	Above Average (<i>n</i> = 70)		Average or Below (<i>n</i> = 57)		<i>F</i> Ratio <i>df</i> (1, 125)	<i>F</i> Prob
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Evaluative thinking	3.75	.51	3.65	.47	1.10	0.30
Voicing opinions	3.59	.59	3.36	.63	4.28	0.04
Comparative validation	2.98	.66	3.13	.59	1.81	0.18
Decision-making	4.20	.42	4.11	.55	1.12	0.29
Self-assessing	3.66	.58	3.45	.69	3.41	0.07

Table 8 shows the effect of college student participants' self-reported academic grades for each scale. A significant difference was found $F(1, 125) = 4.28, p = .04$ in the area of voicing opinions with students who assigned themselves above average grades ($M = 3.58, SD = .59$) assigning themselves higher scores in their ability to voice their opinions compared to students who received average or below average grades ($M = 3.47, SD = .77$).

Television Watching

Data on participants' television viewing habits were not collected from college students. Tables 9 through 15 report the differences between three levels of hours spent watching television for each of the junior and high school respondent groups. As seen in Table 9, seventh-grade participants differed significantly in areas of evaluative thinking,

$F(2,125) = 5.16, p = .01$, and self-assessment, $F(2,125) = 4.88, p = .01$, according to the amount of television they reported watching.

Seventh graders who reported spending more than 6 hours watching television each week ($M = 3.07, SD = .78$) were significantly less effective at using evaluative thinking than either the 0-3 hour group ($M = 3.49, SD = .66$) or the 3-6 hour group ($M = 3.59, SD = .76$). Likewise, seventh graders who reported spending more than 6 hours watching television each week ($M = 3.38, SD = .83$) were significantly less effective at being able to self-assess than either the 0-3 hour group ($M = 3.76, SD = .77$) or the 3-6 hour group ($M = 3.95, SD = .69$).

Table 9

ANOVA for 7th Grade Self-Reported Time Spent Watching Television for

CASE Scales

Scales	0-3 hours (<i>n</i> = 58)		3-6 hours (<i>n</i> = 37)		More than 6 hours (<i>n</i> = 33)		<i>F</i> Ratio <i>df</i> (2,125)	<i>F</i> Prob
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Evaluative thinking	3.49	.66	3.59	.76	3.07	.78	5.16	0.01
Voicing opinions	3.51	.71	3.58	.75	3.33	.70	1.14	0.33
Comparative validation	2.86	.61	2.80	.64	2.98	.73	0.67	0.51
Decision-making	3.92	.57	3.96	.55	3.71	.46	2.08	0.13
Self-assessing	3.76	.77	3.95	.69	3.38	.83	4.88	0.01

As seen in Table 10, ninth-grade participants' differed significantly in the area of comparative validation, $F(2,67) = 4.02, p = .02$, according to the amount of television they reported watching. Ninth graders who reported spending more than 6 hours watching television each week ($M = 3.27, SD = .54$) were significantly more effective at using comparative validation than either the 0-3 hour group ($M = 2.96, SD = .58$) or the 3-6 hour group ($M = 2.70, SD = .63$).

As seen in Table 11, eleventh-grade participants' differed significantly in areas of evaluative thinking, $F(2,68) = 5.06, p = .01$ and decision-making $F(2,68) = 3.28, p = .04$ according to the amount of television they reported watching. Eleventh graders who reported spending 0-3 hours watching television each week ($M = 3.58, SD = .60$) were significantly more effective at using evaluative thinking than either the 3-6 hour group ($M = 3.06, SD = .59$) or the 6 or more hour group ($M = 3.32, SD = .71$). Likewise, 11th graders who reported spending 0-3 hours watching television each week ($M = 3.62, SD = .68$) were significantly more effective at being able to self-assess than either the 3-6 hour group ($M = 3.53, SD = .67$) or the 6 or more hour group ($M = 3.38, SD = .47$).

Time Reading

As seen in Table 12, seventh-grade participants' differed significantly in the area of voicing opinions $F(2,125) = 6.43, p = .00$ according to the amount of time they reported reading. Seventh graders who reported spending 0-3 hours reading each week ($M = 3.25, SD = .70$) were significantly more effective at being able to voice their opinions than either the 3-6 hour group ($M = 3.74, SD = .68$) or the 6 or more hour group ($M = 3.58, SD = .69$).

Table 10

ANOVA for 9th Grade Self-Reported Time Spent Watching Television for CASE Scales

Scales	0-3 hours (n = 35)		3-6 hours (n = 21)		More than 6 hours (n = 14)		F Ratio df(2,67)	F Prob
	M	SD	M	SD	M	SD		
Evaluative thinking	3.29	.79	3.23	.63	3.13	.80	0.22	0.80
Voicing opinions	3.47	.71	3.51	.68	3.34	.69	0.27	0.77
Comparative validation	2.96	.58	2.70	.63	3.27	.54	4.02	0.02
Decision-making	3.91	.62	3.83	.40	3.82	.90	0.14	0.87
Self-assessing	3.62	.75	3.70	.74	3.52	.95	0.21	0.81

Table 11

ANOVA for 11th Grade Self-Reported Time Spent Watching Television for CASE Scales

Scales	0-3 hours (n = 33)		3-6 hours (n = 24)		More than 6 hours (n = 14)		F Ratio df(2,68)	F Prob
	M	SD	M	SD	M	SD		
Evaluative thinking	3.58	.60	3.06	.59	3.32	.71	5.06	0.01
Voicing opinions	3.81	.73	3.37	.74	3.39	.77	3.09	0.05
Comparative validation	2.19	.61	3.20	.65	3.07	.62	0.23	0.80
Decision-making	4.19	.49	3.87	.43	3.99	.50	3.28	0.04
Self-assessing	3.62	.68	3.53	.67	3.38	.47	0.68	0.51

Table 12

ANOVA for 7th Grade Self-Reported Time Spent Reading for CASE Scales

Scales	0-3 hours (<i>n</i> = 58)		3-6 hours (<i>n</i> = 44)		More than 6 hours (<i>n</i> = 26)		<i>F</i> Ratio <i>df</i> (2,125)	<i>F</i> Prob
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Evaluative Thinking	3.26	.70	3.62	.69	3.37	.86	2.93	0.05
Voicing Opinions	3.25	.70	3.74	.68	3.58	.69	6.43	0.00
Comparative Validation	2.79	.67	2.92	.66	2.99	.58	1.01	0.37
Decision-Making	3.82	.53	3.92	.57	3.93	.54	0.59	0.55
Self-Assessing	3.59	.81	3.80	.78	3.85	.72	1.34	0.27

An area that approached significance was evaluative thinking $F(2,125) = 2.93, p = .05$. Seventh graders who reported spending 3-6 hours reading each week ($M = 3.62, SD = .69$) were significantly more effective at using evaluative thinking than either the 0-3 hour group ($M = 3.26, SD = .70$) or the 6 or more hour group ($M = 3.37, SD = .86$).

As seen in Table 13, ninth-grade participants' differed significantly in areas of evaluative thinking and $F(2,67) = 3.63, p = .03$, voicing opinions $F(2,67) = 6.54, p = .00$ according to the amount of time they reported reading. Ninth graders who reported spending 6 or more hours reading each week ($M = 3.61, SD = .83$) were significantly more effective at using evaluative thinking than either the 0-3 hour group ($M = 3.07, SD = .70$) or the 3-6 hour group ($M = 3.21, SD = .47$). Likewise, ninth graders who reported spending 3-6 hours reading each week ($M = 3.86, SD = .71$) were significantly more

effective at being able to voice their opinions than either the 0-3 hour group ($M = 3.23$, $SD = .59$) or the 6 or more hour group ($M = 3.74$, $SD = .71$).

As seen in Table 14, eleventh-grade participants' differed significantly in area of evaluative thinking and $F(2,68) = 3.85$, $p = .03$ according to the amount of time they reported reading. Eleventh graders who reported spending 6 or more hours reading each week ($M = 3.63$, $SD = .40$) were significantly more effective at using evaluative thinking than either the 0-3 hour group ($M = 3.22$, $SD = .66$) or the 3-6 hour group ($M = 3.17$, $SD = .60$).

Computer Use

For each grade level, cognitive autonomy subscales did not differ significantly between subgroups defined by self-reported time spent using the computer each week.

Table 13

ANOVA for 9th Grade Self-Reported Time Spent Reading for CASE Scales

Scales	0-3 hours (<i>n</i> = 41)		3-6 hours (<i>n</i> = 10)		More than 6 hours (<i>n</i> = 19)		<i>F</i> Ratio <i>df</i> (2,67)	<i>F</i> Prob
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Evaluative thinking	3.07	.70	3.21	.47	3.61	.83	3.63	0.03
Voicing opinions	3.23	.59	3.86	.71	3.74	.71	6.54	0.00
Comparative validation	2.83	.61	3.02	.53	3.14	.65	1.86	0.16
Decision-making	3.73	.68	4.10	.26	4.05	.57	2.73	0.07
Self-assessing	3.62	.72	3.57	.86	3.67	.89	0.06	0.95

Table 14

ANOVA for 11th Grade Self-Reported Time Spent Reading for CASE Scales

Scales	0-3 hours (<i>n</i> = 51)		3-6 hours (<i>n</i> = 13)		More than 6 hours (<i>n</i> = 7)		<i>F</i> Ratio <i>df</i> (2,68)	<i>F</i> Prob
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Evaluative thinking	3.22	.66	3.17	.60	3.63	.40	3.85	0.03
Voicing opinions	3.54	.81	3.82	.60	3.43	.68	0.83	0.44
Comparative validation	3.19	.56	3.32	.75	2.74	.63	2.19	0.12
Decision-making	4.03	.52	4.06	.40	4.07	.48	0.04	0.96
Self-assessing	3.57	.64	3.51	.68	3.43	.60	0.16	0.86

Time Spent at Home Alone

As seen in Table 15, seventh-grade participants' differed significantly in areas of evaluative thinking and $F(2,124) = 4.84, p = .01$, voicing opinions $F(2,124) = 4.51, p = .01$, decision-making $F(2,124) = 4.66, p = .01$, and self-assessing $F(2,124) = 3.31, p = .04$ according to the amount of time they reported home alone each week. Seventh graders who reported spending no time home alone were significantly more effective at using evaluative thinking ($M = 3.55, SD = .67$) than either the 1-2 hour group ($M = 3.51, SD = .65$) or the 3 or more hour group ($M = 3.06, SD = .88$). Seventh graders who reported spending no time home alone were significantly more effective at voicing opinions ($M = 3.63, SD = .66$) than either the 1-2 hour group ($M = 3.58, SD = .63$) or the 3 or more hour group ($M = 3.18, SD = .80$). Seventh graders who reported spending no time home alone were significantly more effective at self-assessment ($M = 3.94, SD = .64$) than either the

1-2 hour group ($M = 3.68, SD = .84$) or the 3 or more hour group ($M = 3.47, SD = .82$).

Seventh graders who reported spending 1-2 hours home alone ($M = 3.99, SD = .51$) were significantly more effective at being able to make decisions ($M = 3.99, SD = .51$) than either the no time home alone group ($M = 3.93, SD = .43$) or the 3 or more hour group ($M = 3.63, SD = .66$).

No significant differences were found in any of the scale areas for ninth- and eleventh-grade participant's self-reported time spent home alone each week for each CASE scale.

Table 15

ANOVA for 7th Grade Self-Reported Time Spent Home Alone for CASE

Scales

Scales	None (<i>n</i> = 43)		1-2 hours (<i>n</i> = 54)		3 or more hours (<i>n</i> = 30)		<i>F</i> Ratio <i>df</i> (2,124)	<i>F</i> Prob
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Evaluative thinking	3.55	.67	3.51	.65	3.06	.88	4.84	0.01
Voicing opinions	3.63	.66	3.58	.63	3.18	.80	4.51	0.01
Comparative validation	2.82	.68	2.90	.57	2.91	.76	0.26	0.77
Decision-making	3.93	.43	3.99	.51	3.63	.66	4.66	0.01
Self-assessing	3.94	.64	3.68	.84	3.47	.82	3.31	0.04

CHAPTER V

DISCUSSION

Introduction

The purpose of this study was to contribute knowledge of cognitive autonomy in adolescence by examining the relationship between facets of autonomy and adolescents' ability to think for themselves versus what their peers or parents might influence them to think. Changes in cognitive autonomy between differing ages and gender were also analyzed. Students attending Northern Utah schools participated in this study. A total of 396 participants responded to the Cognitive Autonomy and Self Evaluation (*CASE*) Inventory (Beckert, 2005), which examined areas of cognitive autonomy and self evaluation.

Cognitive Autonomy Findings

Grade Differences

The contributions of this study include several findings. The first research question focused on how scores on the *CASE* inventory differ for adolescents in Grades 7, 9, 11, and college students. A significant difference was found in three of the five scale areas (evaluative thinking, comparative validation, and decision-making). Of the three scales, college students rated themselves higher than 7th, 9th, and 11th graders in being able to evaluate their thinking and make their own decisions. These results are consistent with the literature by Caskey and Ruben (2003), which states that the frontal lobe of the brain that controls planning and judgment, known as the prefrontal cortex, remains immature during the period of the adolescent years. During this time the adolescent brain

relies more on the amygdale which regulates emotions such as fear, rage, and other “gut” reactions, instead of the prefrontal cortex (Giedd et al., 1999). Naturally, college students’ ability to evaluate their thinking and make decisions would be greater than 7th, 9th, and 11th graders because their prefrontal cortex has developed over time.

In the area of comparative validation, results showed that 7th grade adolescents rated themselves as being lowest at comparative validation than all other three grade levels. Likewise, 9th graders rated themselves lower than 11th and college students. 11th graders rated themselves highest in comparative validation above all other grade levels. College students showed a decrease in comparative validation in comparison to 11th graders but still rated themselves higher than 7th or 9th graders. This decrease in seeking outside opinion was consistent with the literature by Bednar & Fisher (2003) which speculates of a dramatic adolescent transition that often takes place when adolescents go from being parent-oriented to being peer-oriented. In 7th and 9th grade, adolescents are unable to drive and, by circumstance, must rely on their parents to a greater degree than an 11th grader who is able to drive themselves to the mall, to the movies, or to hang-out’s. When a teenager is unable to transport themselves, often they are at the mercy of the transporter to decide to which locations they will go, in which places they will hang out, and so forth.

Eleventh graders, now able to drive themselves, are less likely to ask permission to go see a particular movie, what clothes they can buy when at the mall, and who they can hang out with and where. The interesting result was with college students showing a decrease in comparison to 11th graders when seeking comparative validation. This decrease in seeking opinions from adults and peers could be due, in part to their increased

maturity. College students, now entering a university and an "adult" world, may see the wisdom in seeking advice from others before acting on their own. Another consideration is the fact that because college students are generally living on their own they may begin seeking more validation because of their newfound independence. Or it could simply be that the ease of comparative validation has been removed as proximity to outside advisors has decreased.

In summary, as learned from Caskey and Ruben (2003), as adolescents mature, so does their brain. An adolescents' ability to make decisions and properly evaluate their thinking will be far superior to a toddler's, in most cases. Likewise, a more mature adult in college will also exhibit a higher ability to use cognitive autonomy in their decision-making, comparative validation, and so forth. Over time, as the brain matures and develops, so does cognitive autonomy. However, we also understand from the same literature that the underdevelopment of the prefrontal cortex does not mean ignorance. It is possible for an adolescent to develop cognitive autonomy as they practice healthy behaviors such as reading, limited computer and television use, and so forth. These will be discussed further in succeeding paragraphs.

Gender Differences

The second research question focused on how scores would differ on the *CASE* based on gender for each sample group. For ninth-grade students, evaluative thinking and decision-making were the only scales that showed a significant difference between genders. Of the two scales, females rated themselves higher than boys in evaluative thinking and decision-making. This finding relates to the literature by Schvaneveldt and

Adams (2001) where they hypothesized that males, when making decisions, are more likely to plan out their decisions, whereas females are more likely to use an intuitive approach when making decisions. When evaluating their thinking and decision-making, females intuitive reaction may prove to be more autonomous than the male "planning" approach. However, studies comparing male and female adolescents on their decision strategies and use of cognitive autonomy have been relatively unexplored.

Adolescents ability to predict the consequences of risk-taking behavior from different components of their decision-making processes was also examined in the literature review (e.g., Bentin et al., 1993; Morrison, 1985; Namerow et al., 1987; Phelps, 1987). However, the literature still lacks consensus about how cognitive autonomy relates to other potentially important aspects of independent thought such as evaluative thinking in adolescence, or how decision-making differs between genders.

Gender was not a significant factor in this study for 7th grade, 11th grade, or college students. Expectations based on the literature review suggested that gender usually does not make a difference on reflected appraisals in connection with self-evaluations, although there are some mixed results. Interestingly, a previous study done by Schwalbe and Staples (1991) showed that females are perceived as being affected more strongly by the appraisals of friends, whereas boys were affected more strongly by the appraisals of parents. This study found that while gender was generally not a determining factor of autonomy, females in 7th, 9th, and 11th grade almost always rated themselves higher than males in every *CASE* scale. For college students however, males rated themselves higher in most *CASE* scales than females.

These findings are consistent with literature which shows females as maturing faster, thus leaving males predominantly trailing females throughout elementary, junior high, and some of high school. By the latter years of high school and college, a role reversal takes place where males either catch up to females or surpass them in autonomy. Fleming (2005) examined how male and female adolescents view autonomy and found that there were general gender-associated differences with regards to autonomy in adolescence and that these differences start at the 16- to 17-year age bracket. She also found that in late adolescence, boys show a higher rate of achievement of autonomy than girls, and this is associated with a greater frequency of parental disobedience among boys.

The third and final research question focused on how the participants self-reported school grades, hours spent at home alone, TV, computer, reading, relate to cognitive autonomy as it relates to participant scores on the *CASE*.

Academic Grades

Both seventh and ninth graders each showed significance in making decisions and having above average grades. These findings could be explained that adolescents who are higher in cognitive autonomy are better equipped to utilize higher decision-making skills and thus choose to complete their homework before play and thereby obtain above average grades. This study found that participants who showed higher areas of autonomy *always* had above average grades and were, perhaps, more capable of deciding, "I'll finish my homework and take out the garbage, and then I'll call my friends about seeing a movie" (Wallis, 2004, p. 56). These results are consistent with adolescents who have

initial thoughts to avoid homework and spend time in recreation. Those adolescents who are able to identify those thoughts and then make a decision that will benefit them in the long run are better able to also keep above average grades.

These findings also suggest that adolescents who report themselves as having above average grades also exhibit more autonomy in evaluating their thinking, voicing opinions, making decisions, self-assessing, and utilizing comparative validation. The results from this study also showed that seventh graders rated themselves as having autonomy in four of the five scale areas, whereas ninth and college students rated only one of the five areas. These results suggest somewhat that the younger the adolescent, the more perceived autonomy; the older the adolescent, the less. Also interesting in this study was that seventh- and ninth-grade students who rated themselves high in their abilities to voice their opinions, also rated themselves as having above average grades each time. Literature suggests that students who participate in class with verbal comments also exhibit higher academic grades (Finn & Cox, 1992).

Time Spent Watching Television

A significant difference was found amongst seventh graders in the scale areas of evaluative thinking, and self-assessment. In the evaluative thinking and self-assessment scales, seventh graders who reported spending more than six hours watching television each week were significantly less effective at using evaluative thinking and self-assessment than either the 0-3 hour or 3-6 hour groups.

A significant difference was found amongst ninth graders in the scale area of comparative validation. The ninth graders who reported spending more than six hours

watching television each week were significantly more effective at using comparative validation than either the 0-3 hour or 3-6 hour group.

A significant difference was found amongst eleventh graders in the scale areas of evaluative thinking and decision-making. Of those three scale areas, eleventh graders who reported themselves as watching the most television in the 0-3 hour time slot were significantly more effective at using evaluative thinking and self-assessment than either the 3-6 hour group or the 6 or more hour group.

Although studies examining the connection between hours of television watched and cognitive autonomy have not been conducted, this study shows mixed results of adolescents who report themselves as watching more hours of television having higher autonomy than those that watch less, as well as less autonomy as those participants who watch more. Reasons for these findings could be that adolescents who watch little television may do so because of rules imposed by their parents, whereas adolescents who watch more television may do so because the choice to watch television is made by the adolescent rather than the parent, thus giving the adolescent more freedom to exercise their own autonomy. Other literature that supports these findings was done by Giles and Maltby (2004) who researched the effect of the transition from parental attachment to peer attachments would have in relation to emotional autonomy and found that high emotional autonomy was a significant predictor of celebrity interest, as well as high attachment to peers, low attachment to parents.

On the reverse side, one study done by Levin and Carlsson-Paige (1994) researched two developmental issues, what children see on TV, and what children should see. The developmental issues included the following: to establish a sense of trust and

safety, to develop a sense of autonomy with connectedness, to develop a sense of improvement, to establish gender identity, to develop an appreciation of diversity among people, and to have opportunities for meaningful play. Within this framework, Levin and Carlsson-Paige contend that television negatively impacts on the healthy social, emotional, and intellectual development of young children.

Time Spent Reading

A significant difference was found amongst seventh-grade participants in the scale area of voicing opinions. Those who rated themselves highest in voicing opinions also rated themselves as reading 0-3 hours a week.

A significant difference was found amongst ninth-grade participants in the scale area of evaluative thinking. Those who rated themselves highest in evaluative thinking also rated themselves as reading more than six hours a week. Those participants who rated themselves highest in voicing opinions also rated themselves as reading 3-6 a week. An area that approached significance was found in decision-making. This scale area also showed ninth-grade adolescents rating themselves highest as reading 3-6 hours a week.

A significant difference was found amongst eleventh-grade participants in the scale area of evaluative thinking. Eleventh graders who rated themselves high in evaluating their thinking, also rated themselves as reading more than six hours a week.

Those grades who rated themselves as reading 3 or more hours a week all showed increased autonomy in being able to evaluate their thinking. For seventh and ninth graders, those participants who rated themselves as reading 3 or more hours a week also reported themselves as being more autonomous in voicing their opinions.

As stated in the literature review, to this researchers knowledge, no studies thus far have examined the correlation between time spent reading and cognitive autonomy in adolescence. This study found, however, that adolescents who rated themselves as reading three or more hours per week, also rated themselves highest in being able to evaluate their thinking and voicing their opinions. These findings suggest that the more reading adolescents do, the more likely they are to assess their thinking and perhaps later, voice their opinions either on what they have evaluated from their thinking, or what they have learned from their readings. These findings are significant in showing a correlation with reading and the ability to autonomously evaluate one's thoughts and opinions.

Time Spent Home Alone

Data on participants' television viewing, reading, computer use, and time spent home alone were not collected from college students due to the incongruence that results from college living and children who live at home. Seventh-grade participant's self-reported time spent home alone showed a significant difference in four of the five scale areas. Those who rated themselves highest in the three scale areas of evaluative thinking, voicing opinions, and self-assessing, also rated themselves as spending no time home alone.

For ninth-grade participants, a significant difference was not found in any of the scale areas. Two areas that approached significance showed ninth- and eleventh-grade participants' self-reported time spent home alone each week for each scale, no significant difference was found in any of the scale areas.

These findings are similar to other literature which showed a study where the relationship among after-school time, parental monitoring, and problem behavior was examined in a sample of 1,170 early adolescents by Flannery, Williams, and Vazsonyi (1999). They found that those adolescents spending unsupervised time with peers reported higher levels of aggression, delinquency, substance use, and susceptibility to peer pressure, and lower levels of parental monitoring, than did adolescents at home with parents. Adolescents that spent time home alone after school were found to be similar to those who spent time with adults or in school activities.

The results from this study indicate that young adolescents who report spending three or more hours home alone scored significantly lower in some areas of cognitive autonomy than those who spend less time alone. These results indicate that seventh-grade adolescents who spend three or more hours home alone without the supervision of parents or adults are less autonomous in areas of evaluative thinking, voicing opinions, decision-making, and self-assessment than seventh-grade adolescents who spent less time home alone. Ninth and 11th graders showed no significant difference in areas of cognitive autonomy pertaining to time spent home alone.

These results seem to indicate that the younger the adolescent, the more importance the presence of an adult becomes. The presence of an adult seems to foster autonomous thought in younger adolescents. By the time adolescents reach high school age, the presence of an adult after school seems to have less of an impact on adolescent autonomous thought.

Computer Use

Seventh-, ninth- and eleventh-grade participants' self-reported time spent using the computer each week yielded no significant difference in any of the scale areas. These findings were contrary to the literature which examined the impact of home computer use on child and adolescent development (Subrahmanyam et al., 2001) and found that teenagers use the computer more than younger children or adults. They also found that use is greater for boys compared to girls, for Whites compared to Black or Hispanic children, and for children in households with higher parental income and education. That same study also found that adolescents spend more time watching television than using computers, although computer users watch less television than non-computer users. To this researchers knowledge, aside from these research findings, there has been no study conducted correlating the effect that computer use has on cognitive autonomy in adolescence.

Limitations

There are limitations to be considered in this study. One limitation is that participants were selected for this study by convenience, rather than by random selection. Therefore, caution should be used in generalizing these findings to other populations.

This study was also limited in that it was only distributed to four different grade levels. The goal of this project was to gain an understanding of these constructs in adolescence. A wider range of grade levels may also yield interesting results. Future research could incorporate a few more grade levels to add more diversity to the outcome.

Other threats to internal validity could have been demand characteristics as the students may have responded to the measures in ways they perceived to be the most socially desirable, or in ways describing themselves as they wished they were. For example, students may have realized that the *CASE* was examining their autonomy. Those who wish to prove they are "autonomous" may answer a question that places them in a more autonomous light than what they really are. Although it can be argued that such could be the case for all respondents and thus aggregate mean scores would equally reflect this limitation.

Directions for Future Research

This study shows both interesting trends and statistically significant differences; both of which give insight to promising avenues for future research. Further research involving older and younger groups, such as 6th grade, 8th grade, 10th grade, 12th grade, and so on, could provide a closer look at cognitive autonomy as it differs between ages in greater detail. Continuing research with subjects who represent older adolescents from higher and lower grades could show a more complete picture of the progression of cognitive autonomy by grade. Further research could also involve more ethnically diverse groups that could discover the differences or non-differences between different ethnicities.

Similarly, developing a longitudinal assessment which would follow subjects throughout adolescence and early adulthood, would offer a poignant look at the development of cognitive autonomy by age/grade and gender in a more continuous

manner. By following individuals through an extended period of their adolescent development, a more extensive perspective of cognitive autonomy could be obtained.

Conclusions

This research project was conducted with the intended purpose of contributing to the overall understanding of cognitive autonomy as it relates to adolescents. The theories on cognitive autonomy development are relatively new, and it is hoped that any study of this topic will contribute to the continued development and understanding of these theories.

In this study, one trend that surfaced was that cognitive autonomy increases as adolescents mature. Additional research could further identify how cognitive autonomy develops between ethnicities and differing socioeconomic status, as well as how developed it is for adults at differing age ranges. Such research could provide suggestions for improving cognitive autonomy for adolescents whether through interactive programs designed to help foster autonomous thinking, or through parenting classes that teach and implement skills to help parents in developing their child's cognitive autonomy.

Furthermore, participants in this program showed a significant difference in their academic grades and increase in autonomous thinking when they read three or more hours a week. This trend carried between all grade levels. The development of programs that foster the habit of reading to encourage autonomous thinking may show a profound effect on young adolescents. Additionally, if this type of a program were implemented, it would be important to promote reading and autonomous thinking at younger grade levels.

The factors studied herein could be utilized specifically in all school systems to design and fund future programs that will effectively promote the development of cognitive autonomy, and in turn, promote additional positive outcomes such as increased reading time, decrease in time spent home alone, computer usage, and so forth. As mentioned earlier, literature supports the benefits of autonomous thinking in adolescents. However, children also appear to benefit from other factors such as reading, time spent in adult supervision, less time watching television and computer usage, and so forth. A program that combines elements such as decision-making opportunities and reading, or voicing opinions and time spent home alone, etc., could further foster the development of cognitive autonomy along with those positive outcomes with which it has been correlated.

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APPENDICES

APPENDIX A

Letter

Letter of Invitation to Parents

Dear Parents:

Our students have been selected to participate in a brief survey for the department of family, consumer, and human development at Utah State University. This research project seeks to understand the ways adolescents think about decisions.

Your child's participation will involve filling out an anonymous questionnaire that will take less than 10 minutes of class time to complete. The results of the study may be published, but because the survey is anonymous no connection will be made to your child in any way.

The questions on the survey deal with everyday decisions and do not contain any controversial content (there are no questions dealing with sex or drugs) and there are no questions that ask the child to report behaviors.

Participation is voluntary so if you do not wish your child to participate, that will be fine. If you have any questions or concerns please contact me.

Sincerely,

APPENDIX B

CASE Inventory

CASE[©] Inventory

CASE[©] Inventory
An assessment of Cognitive Autonomy and Self-Evaluation

By
Troy E. Beckert

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CASE[©] Inventory

1. Gender
 Male
 Female
2. Age _____
3. Year in school
 7th grade 8th grade
 9th grade 10th grade
 11th grade 12th grade
 College Freshman
 College Sophomore
 Other
4. Ethnicity
 White
 Black
 Hispanic
 Asian
 Other
 Please Specify _____
5. School Grades
 above average
 average
 below average
6. Hours spent home alone each
 weekday
 (jr. and senior high students)
 None 1 - 2
 3 - 4 more than 4
7. Hours spent reading per week
 None 1 - 2
 3 - 4 more than 4
8. Hours spent on computer per week
 for homework.
 None 0 - 3
 3 - 6 6 - 10
 More than 10-6
9. Hours spent on computer per week
 for fun.
 None 0 - 3
 3 - 6 6 - 10
 More than 10-6
10. Do you live with your parents while
 attending school? (College students)
 Yes No

CASE[©] Inventory

Directions: For each item, circle the answer that best illustrates your thoughts today. Answer all of the questions by clearly circling one of the five choices.

1. If I have something to add to a class discussion I speak up.
 Always Often Sometimes Seldom Never
2. I think about the consequences of my decisions.
 Always Often Sometimes Seldom Never
3. I look at every situation from other people's perspectives before making my own judgments.
 Always Often Sometimes Seldom Never
4. When I disagree with others I share my views.
 Always Often Sometimes Seldom Never
5. I need family members to approve my decisions.
 Always Often Sometimes Seldom Never
6. I think of all possible risks before acting on a situation.
 Always Often Sometimes Seldom Never
7. I like to evaluate my daily actions.
 Always Often Sometimes Seldom Never
8. I consider alternatives before making decisions.
 Always Often Sometimes Seldom Never
9. I stand up for what I think is right regardless of the situation.
 Always Often Sometimes Seldom Never
10. I think about how my actions will affect others.
 Always Often Sometimes Seldom Never
11. I think about how my actions will affect me in the long run.
 Always Often Sometimes Seldom Never
12. I like to evaluate my thoughts.
 Always Often Sometimes Seldom Never

CASE[©] Inventory

Directions: For each item, circle the answer that best illustrates your thoughts today. Answer all of the questions by clearly circling one of the five choices.

- | | | | | | |
|--|----------------|-------|---------|----------|-------------------|
| 13. I feel that my opinions are valuable enough to share. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 14. I need my views to match those of my parents. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 15. I am good at identifying my own strengths. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 16. It is important to me that my friends approve of my decisions. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 17. There are consequences to my decisions. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 18. I can tell that my way of thinking has improved with age. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 19. At school I keep my opinions to myself. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 20. I think more about the future today than I did when I was younger. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 21. I am best at identifying my abilities. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 22. My decision making ability has improved with age. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 23. I need my views to match those of my friends. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 24. I am good at evaluating my feelings. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 25. I am better at decision making than my friends. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 26. I care about what others think of me. | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |

CASE[©] Inventory

27. I am the best judge of my talents.

Strongly Agree Agree Neutral Disagree Strongly Disagree

28. If you were to rate yourself on your "independent thought" today, what score would you assign from 1 - 10 with ten being the most independent? Please provide a brief paragraph to justify your assigned score.

_____ Score (from 1 -10).