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Title: The Influence of Cognitive Development, Self-Esteem, and Alcohol Use on the Sexual Behavior of Adolescents and Young Adults

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The purpose of this study was to gain an understanding of the sexual behavior of adolescents and young adults by examining factors related to cognitive development, self-esteem, and alcohol use. Participants were 59 high school students from two rural high schools, and 41 college students recruited from Introductory and Developmental Psychology classes at a Midwestern university. The specific cognitive measures used for this study were the Imaginary Audience Scale (IAS), the Life Events Questionnaire-Positive Events (LEQ-PE) and the Life Events Questionnaire-Negative Events (LEQ-NE), and a temporal discounting measure. The Rosenberg Self-Esteem Scale (RSE) was also used to measure self-esteem, and a Demographic Questionnaire was constructed by the researcher and included questions regarding alcohol use and sexual behavior. Results indicated that the college sample scored significantly higher than the high school sample on the IAS, indicating the college students were less advanced in terms of cognitive development on this measure. The other measures of cognitive development did not produce significant between group differences. The college sample also scored significantly higher on the RSE, indicating that the college sample had higher self-esteem than the high school sample. In addition, the college sample reported a larger number of sexual encounters within the past 30 days than the high school sample. One of six

regression equations that were computed was significant; the significant equation utilized frequency of contraception use as the criterion variable, and temporal discounting, pessimistic bias, and frequency of alcohol use in a typical 30-day period served as predictors. The overall model accounted for approximately 41% of the variance.

THE INFLUENCE OF COGNITIVE DEVELOPMENT, SELF-ESTEEM, AND ALCOHOL USE ON THE SEXUAL BEHAVIOR OF ADOLESCENTS AND YOUNG ADULTS

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Over the past 20 years, there has been an increase in the number of adolescents who engage in sexual activity, and the age of onset for sexual behavior has declined as well (Abma, Chandra, Moshew, Peterson, & Piccinino, 1997). There is no doubt that our society has adopted more permissive attitudes when it comes to adolescent sexuality, but the costs of this permissive attitude have yet to be determined. Adolescents who engage in sexual activity prior to the age of 16 are putting themselves and their health at jeopardy; sexually transmitted infections and unplanned pregnancy are two of the most hazardous effects that could result from adolescents engaging in sex. Most of the risks involved with sexual intercourse are well known by adolescents and adults alike, yet many adolescents choose to engage in risky sexual behavior that could have disastrous effects in their lives.

One concern that evolves from the issue of adolescent sex is the risk of sexually transmitted infections (STIs). If left untreated, STIs can have many aversive health consequences such as infertility, ectopic pregnancy, and even death (Center for Disease Control [CDC], 2001). Given the dramatic consequences of STIs, it is particularly unsettling that the rates of STIs are high for adolescents, especially girls. The United States has the highest rates of chlamydia and the second highest rates of gonorrhea and syphilis of all the developed countries studied by Panchaud, Singh, Feivelson, and Darroch (2000). While most developed nations have experienced a decline in the incidence of syphilis, the rates have remained stable in the United States (U.S.). Adolescents in the U. S. are three to six times more likely to become infected with

gonorrhea than the adult population. The rates of chlamydia for adolescent females are especially alarming; it is estimated that approximately 10% of all sexually active adolescent girls were infected with chlamydia in the 1990s (Panchaud, Singh, Feivelson, & Darroch, 2000). In addition, Dickson, Paul, Herbison, and Silva (1998) reported that adolescent girls who initiated sex prior to the age of 16 had an even higher chance of becoming infected with a STI than adolescents who initiated sexual intercourse at the age of 16 or older.

Another health risk faced by sexually active adolescent girls is pregnancy. The health effects of pregnancy for mother and child are most noticeable among adolescents who are 15 years of age or younger. Young adolescents have an increased risk of preeclampsia and eclampsia. In addition, young adolescents are more likely to have a preterm delivery, and their babies are more likely to be classified as low birth weight or very low birthrate (Eure, Lindsay & Graves, 2002). In addition to health concerns, many adolescent mothers may experience emotional distress due to their premature entry into motherhood. Emans (1983) reported that isolation and depression are probable responses after an adolescent becomes a mother. Having a child as an adolescent often hinders the educational attainment of the mother, and limits the career opportunities available to her. Often, the adolescent mother must choose between marrying prematurely to secure a financial future for her and her offspring, or face the daunting task of raising a child alone (Friedman, 1989).

Though rates of adolescent pregnancy have declined over the past 30 years, the United States still has higher rates than most other developed countries. The U.S. has the second highest pregnancy rate, the second highest birthrate, and the fifth highest abortion

rate of the 46 countries examined by Singh and Darroch (2000). In the year 2000, it was estimated that just fewer than 50 out of 1,000 girls, ages 15-19, became pregnant (Martin, Hamilton, Ventura, Menacker, & Park, 2002). Singh and Darroch did report that the adolescent birthrate had fallen 20% from 1970-1995; however, some countries experienced a decline of more than 70%. Strides are being made in the prevention of adolescent pregnancy, but the United States still lags behind most other developed countries when it comes to lowering the adolescent birthrate.

The adverse effects of adolescent sexual activity are not limited to physical health concerns. Dickson, Paul, Herbison, and Silva (1998) studied the rates of coerced sexual intercourse, and found that girls who initiated sex earlier than 16 reported they were "less willing" to engage in the sex act than their older counterparts. Girls who initiated sex earlier also reported that they should have waited longer to have sex and regretted their first sexual experience more than the older group. Likewise, adolescents who were 16 or older at the time of first intercourse were more likely to report that they engaged in sex at "about the right time."

Because of the risks associated with adolescent sexual activity, thorough and comprehensive research is needed to describe and predict what leads some adolescents to abstain from sex, some to protect themselves during sex, and some to engage in sex without taking any protective measures at all. A great deal of research has examined demographic variables and personality characteristics that are related to adolescent sexual behavior (see Caspi et al., 1995; Harvey & Spigner, 1995). Others have looked at the role of cognitive functions in sexual decision-making (see Cobliner, 1973; Goldsmith, Gabrielson, Gabrielson, Mathews, & Potts, 1972; Gruber & Chambers, 1987). Self-

esteem (see Orr, Wilbrandt, Brack, Rauch, & Ingersoll, 1989; West, 1997) and substance use (see Cooper, Peirce, & Huselid, 1994; Fergusson & Lynskey, 1996) have been examined at length as well. What seems to be lacking in the research base is a comprehensive approach that integrates several key factors implicated in sexual decision-making. Researchers have created several puzzle pieces that help explain adolescent sexual behavior, but these pieces have to be put together to produce the clearest and most comprehensive picture possible. This thesis will examine three important factors identified in previous research for adolescent sexual behavior: cognitive development, self-esteem, and alcohol use. Cognitive development will form the theoretical framework for this paper, so it will be reviewed extensively. Self-esteem and alcohol use will be involved with the analysis, though the review of these two concepts will be more limited in scope.

Cognitive Development

Theory

Adolescence is a unique time period during human development; adolescents are no longer children, yet not quite adults. Accordingly, the thought patterns and characteristics exhibited by adolescents are unique to this developmental stage. Examining the unique characteristics of adolescents' thought patterns identified by cognitive development theory can provide valuable information regarding the reasons and rationale for their sometimes-risky behavior. The major theoretical base for this research comes from the work of Jean Piaget (1972), so a basic understanding of his ideas is necessary before an application of his theory is made to sexual behavior.

Jean Piaget developed a stage model of cognitive development to describe the qualitative changes children's cognitive structures undergo as they age. The sensorimotor stage of cognitive development starts at birth and lasts until children are approximately two-years-old. During this stage, children acquire information through their senses and experiences, but are not yet capable of using mental symbols to think about the world. The preoperational stage is established around the age of two, and lasts until the age of six. Mental representation and symbols emerge as children begin to learn and produce language. The concrete operational stage begins around the age of seven, and is characterized by a number of achievements in logical thought, such as decentering and reversibility (Piaget, 1972).

The final stage Piaget identified was formal operational thought, which begins to emerge around the age of 11, crystallizes around the age of 15, and lasts throughout adulthood. The prominent characteristic of the formal operational stage is the development of abstract thought, which frees adolescents from the confines of their perceptions and allows them to consider possibility as well as reality. After adolescents have achieved formal operations, they are able to systematically and logically solve problems, even if the problems are not concretely tied to reality (Piaget, 1972).

Gordon (1990) identified four characteristics of formal operational thought that could influence adolescents' decisions about their sexual activity: envisioning alternatives, evaluating alternatives, perspective taking, and estimating chance and probability. The conceptualization of Piaget's theory presented by Gruber and Chambers (1987) is congruent with Gordon's application; they identified perspective taking, the ability to plan for the future, and de-centering as the major cognitive factors responsible

for adolescent sexual decision-making. The constructs used by Gordon will provide the framework used in this study because they are derived from Piaget's work and are validated by Gruber and Chambers.

Identifying and evaluating options. The ability to identify and evaluate multiple alternatives is an important development during adolescence. Adolescents who have achieved formal operations can generate many alternatives of a given situation, including some that are not directly derived from reality. The ability to envision many possibilities provides adolescents with more choices when confronted with problems, which increases the likelihood that they will arrive at a workable solution. In addition to being able to identify many options, formal operators are able to critically evaluate each option and are able to foresee the consequences of each possible decision. Looking into the future allows adolescents to effectively plan their behavior in order to purposefully arrive at a desirable outcome (Gordon, 1990).

Piaget (Inhelder & Piaget, 1958) recognized the importance of future-perspective taking and planning during adolescence. He ascertained that one of the primary tasks for adolescents is the acceptance of adult roles. As adolescents begin to perform tasks related to adulthood, they begin to see themselves as equals of adults and judge them and society rather critically. They begin to see themselves as "great social reformers" and believe they will change the world. This ability to project themselves into the future is a new ability for adolescents. A child's thought is tied very closely to physical reality, whereas the adolescent is able to imagine the future and his or her place in it. The ideas adolescents have about the future are translated into developing a plan for their lives that usually revolve around producing something completely original. As adolescents make

the transition from concrete operations to formal operations, their decisions increasingly begin to reflect their life plan and major goals.

One promising method for measuring future time perspective is by measuring temporal discounting. Temporal discounting refers to "the weakening of consequence effects due to delay" (Critchfield & Kollins, 2001, p. 102), meaning that as a consequence of a behavior is delayed, the perception of the impact of the effect decreases in magnitude. The degree of temporal discounting engaged in by an individual is thought to reflect the level of the individual's self-control and ability to delay gratification (Critchfield & Kollins). Research has shown that discounting occurs for delayed threats as well as delayed rewards, though discounting appears to be stronger for delayed threats (Highhouse, Mohammed, & Hoffman, 2002). Temporal discounting has rarely been studied within a developmental concept, though Green, Myerson, and Ostaszewski (1999) found that levels of temporal discounting are highest among children and lowest among older adults, suggesting that levels of temporal discounting typically decrease with age.

Perspective taking. Another major task confronted by adolescents is the ability to recognize and understand another's perspective. Decentering, or the shift in focus from self to others, is a process present at each developmental stage, including formal operations. For example, infants must learn to separate self from environment; preschoolers must learn to differentiate between the thoughts of self and others; and adolescents going through the transition from concrete to formal operations must learn to take other people's viewpoints into account. Until formal operations are completely achieved, however, adolescents' thoughts are egocentric in nature. According to Piaget

(Inhelder & Piaget, 1958), young people often believe they possess unique and special abilities, and become convinced of their ability to change the world. They develop personal theories that focus on their role as great social reformers, and are convinced of the superiority of their thoughts compared to others.

The imaginary audience (Elkind, 1970) is a further elaboration on the concept of adolescent egocentrism. Elkind hypothesized that adolescents have difficulty discerning what is of interest to them and what is of interest to others. As a result, they begin to believe that others are monitoring every movement they make. The imaginary audience adolescents create can lead to extreme self-consciousness and their actions may be mandated by what they think is pleasing to their audience.

These beliefs typify the egocentrism common in early adolescence, though egocentrism typically begins to decline around the age of 15 or 16 due to the influence of the peer group. As other members of the peer group express their thoughts and feelings, adolescents begin to realize the limitations and banality of their own personal theories. This realization provides them with a more realistic picture of their abilities, and allows them to decenter and appreciate the viewpoints and opinions of others.

Estimating chance and probability. The final cognitive achievement of formal operational thought outlined by Gordon (1990) is the ability to accurately estimate chance and probability. Children who are in the concrete operational stage of development can usually accurately estimate probability, given that the problem is directly related to physical reality. Adolescents who have achieved formal operations can expand that ability to include problems that are abstract or hypothetical in nature (Inhelder & Piaget,

1958). Those adolescents who are in the transition between concrete operations and formal operations tend to misjudge the probability of a hypothetical situation.

Elkind (1970) described the inability of young adolescents to accurately estimate chance through his explanation of the personal fable. The personal fable is closely related to his concept of the imaginary audience (the imaginary audience refers to a fictitious audience the adolescent creates and whom the adolescent wishes to please). If adolescents believe they are the focus of everyone's attention, it is reasonable that they could begin to see themselves as unique and special. Elkind (1979) defined the personal fable as "the belief that the individual is special and not subject to the natural laws which pertain to others" (p. 95). The personal fable can help explain some of the apparent self-destructive behaviors engaged in by many adolescents, such as driving while intoxicated, using illicit and dangerous drugs, and having unprotected sexual intercourse. According to the personal fable, adolescents are not intentionally trying to harm themselves while engaging in these behaviors; they simply underestimate the probability of something aversive happening to them.

Other researchers are somewhat skeptical of the existence of the personal fable. For example, Whaley (2000) argued that the personal fable is not unique to adolescence and that adults tend to perceive self-risk lower than they perceive risk to others. Instead of using the term "personal fable" to describe the discrepancy between perceived risk to self and perceived risk to others, Whaley used the term "optimistic bias" to reflect that adults engage in the same thought processes. Whaley found that adults and adolescents had similar levels of optimistic bias when asked about the risk of HIV/AIDS, STIs, and unplanned pregnancy, which he used to support his theory. However, his adolescent

sample was drawn from undergraduates at a private university who were all at least eighteen-years-old. Inhelder and Piaget (1958) stated that formal operational thought tends to crystallize around the age of 15; according to Piaget's theory, the sample utilized by Whaley would not differ from adults in measures of egocentrism and estimating probability, because formal operational thought would have already been achieved.

Despite the limitations of Whaley's study, his objection to applying optimistic bias/personal fable to adolescence alone may be a valid one. Several research studies have found that adults as well as adolescence engage in some degree of optimistic bias. Given the literature base at this time, it is impossible to determine if optimistic bias is more extreme during adolescence, though there is some support for this notion. Arnett (2000) examined rates of optimistic bias among adolescent and adult smokers versus nonsmokers, and found that smokers scored higher on a measure of optimistic bias than nonsmokers. In addition, he found that adolescent smokers scored higher than adult smokers on the same optimistic bias measure, supporting the idea that optimistic bias decreases with age.

Regardless of what term is used, optimistic bias and the personal fable both refer to peoples' tendency to estimate their risk as being lower than the average person. Often, people will continue to believe they are less likely to experience an aversive event than others, even when they have been provided with accurate information regarding risk factors and incidence rates of that particular event. Weinstein (1982) examined optimistic bias among college students by asking students to estimate their personal risk for developing 45 different health problems compared to the risks faced by others. He found that optimistic bias was found in varying degrees for 34 of the identified health problems.

The phenomena of optimistic bias has also been observed for campus violence (Chapin, 1995), risks of smoking (Arnett, 2000; Baker, Dye, Denniston, & Ainsworth, 2001), and negative life events (Weinstein & Lachendro, 1982; Weinstein, 1980).

Cognitive Development and Adolescent Sexual Behavior

Identifying and evaluating options. The ability to identify and evaluate options is important in sexual decision making in several ways. The most basic decision that has to be made by adolescents is whether or not they will engage in sexual intercourse at all. Adolescents who have achieved formal operations will be creative when envisioning all the alternatives to sex, and will weigh the advantages and disadvantages of each carefully. Adolescents who have decided to have sex must also decide whether or not to use contraception, and if they decide to use contraception, they need to decide which type. Formal operators will evaluate each alternative in a logical manner, focusing on the probable future consequences of their behavior.

Resnick and Blum (1985) found that successful contraceptors have more advanced decision-making skills than pregnant adolescents or those who have had abortions, reinforcing the importance of evaluating options in sexual decision making. Adolescents who have not achieved formal operations may be unable to identify the choices available to them. They may also base their decision on the present and "what feels good" or "what pleases my partner" (Gordon, 1990). The use of these criteria reduces the likelihood of using effective contraception, and increases the likelihood of pregnancy and sexually transmitted infections.

Identifying and evaluating options is also important when adolescents learn of an unplanned pregnancy (Gordon, 1990). Again, formal operators will explore all options

carefully, keeping in mind the future impact of their decisions. Adolescents who have not achieved formal operational thought may not be able to identify all their options after learning of an unplanned pregnancy. Resnick and Blum (1985) found that adolescent mothers did not approach having a baby as a choice, unlike those who aborted their babies. Once the adolescents who would keep their babies were pregnant, the only option they identified was having and keeping their child. This decision could be a result of more conservative political, moral, or religious beliefs, or it could be due to an overly concrete approach to problem solving, or both. Regardless, the ability to identify only one option when making a decision is typical for children in the concrete operational stage, so the adolescent mothers in Resnick and Blum's research displayed cognitions congruent with concrete operations.

Planning for the future is one of the most important criteria for adolescents to consider when evaluating options, including options when it comes to sex. The decision to engage in sexual activity is an admission of one's adult status, so very young adolescents may not yet consider themselves "old enough" to engage in sex (Cvetkovich, Grote, Bjorseth, & Sarkissian, 1975). If young people cannot admit their sexuality, they may be unprepared to deal with sexual issues if and when they arise. This is especially important when adolescents make decisions regarding contraception. Adolescents who cannot imagine their lives in the future may fail to use contraception because they do not realize the long-term effects of this decision (Gordon, 1990).

In order for adolescents to prevent pregnancy and sexually transmitted infection, they must first recognize their own sexuality and admit their adult status, and acknowledge the long-term consequences of their behavior. Then, adolescents must plan

ahead so when they do decide to engage in sex, both partners will be protected. The outcome of both these situations depends, in part, on the adolescent's ability to consider the future when evaluating options.

Resnick and Blum (1985) examined levels of future time perspective among sexually active adolescent girls. They found that those who had abortions had the most developed future time perspective, followed by successful contraceptors, or those who were able to prevent pregnancy thorough use of contraception. It is unclear whether the well-developed future perspective demonstrated by aborters was a result of becoming pregnant and having to make a difficult decision, or a pre-pregnancy characteristic. It would be logical to assume that prior to becoming pregnant, the adolescents who would abort were at the same developmental level as those who would become adolescent mothers, but that assumption has not been tested. Regardless of the reason for aborters' more advanced time perspective, the successful contraceptors and aborters could see the impact of childbirth on their future lives, and realized the enormous responsibility motherhood demanded. Conversely, adolescent mothers had the least developed future time perspective, indicating naive beliefs about what motherhood entails.

Goldsmith, Gabrielson, Gabrielson, Mathews, and Potts (1972) also found that girls with well-developed academic and occupational plans used contraception more often than those without, suggesting those who use contraception are more likely to be focused on the future. Girls who do not use contraception or are already pregnant tend to focus on their immediate situation when making decisions about pregnancy prevention or carrying a child to term. Because of their inability to envision the future, adolescents who

do not use contraception and those who choose to become mothers may not realize the serious consequences that result from their decisions (Blum & Resnick, 1982).

To date, no published studies have examined the influence of temporal discounting on sexual decision-making. In her undergraduate honors thesis, Farr (1998) examined rates of temporal discounting among college students who were classified as either Sexual High-Risk or Sexual Low-Risk. The low-risk category consisted of students who engaged in vaginal intercourse and used condoms consistently, while the high-risk category consisted of students who engaged in vaginal intercourse and used condoms inconsistently. She found that the students in the high-risk category had significantly higher discounting parameter values than students in the low-risk group, reflecting higher discounting rates and lower degrees of future perspective for those students.

Perspective taking. The ability to take another person's viewpoint into account when making a decision may affect the sexual decision making of adolescents. The imaginary audience distorts adolescents' thinking so that they are unable to successfully determine what interests them and what interests others. In order for adolescents to make a rational choice regarding sex and contraception, however, they must be able to ascertain what interests other people. If adolescents are convinced other people are constantly monitoring their behavior, they may not be ready to accept their sexuality for fear of rejection and judgment. Preparing for sex by possessing contraception may be inconceivable for adolescents who are not ready to admit their sexuality to the imaginary audience (Cvetkovich, Grote, Bjorseth, & Sarkissian, 1975).

In support of this idea, Holmbeck, Crossman, Wandrei, and Gasiewksi (1994) reported that adolescent girls who scored low on an imaginary audience measure were

more likely to use contraception than girls who scored high on the same scale. Furthermore, adolescents who live on their own are more likely to use contraception than those who live with an authority figure. If the imaginary audience consists of perceived authority figures, and real-life authority figures are removed, adolescents are free to reject the existence of the imaginary audience and accept their own sexuality (Kanter & Zelnick, 1973). Having a more realistic view of others' interests and a smaller degree of the imaginary audience frees adolescents to make more logical, self-protecting choices (e.g., using contraception).

After adolescent girls learn of an unplanned pregnancy, it is especially important for them to consider another person's perspective. Blum and Resnick (1982) found that girls who chose to have an abortion rather than raise their babies were able to envision the consequences of their decision for themselves as well as for their unborn children. The girls who chose abortion or who placed their babies up for adoption recognized the difficulties associated with being a young mother, and the undesirable consequences their children would have to endure if they chose to keep the baby. On the other hand, adolescents who chose to raise their babies reported considering the viewpoint of their unborn children less than those who ultimately chose abortion.

Estimating chance and probability. The ability to accurately estimate probability has obvious implications for sexual decision making in adolescence. If adolescents underestimate the probability of pregnancy or STIs, they will be less likely to protect themselves by using contraception. One possible manifestation of the personal fable Elkind identified is the sterility fable (Cvetkovich, Grote, Bjorseth, & Sarkissian, 1975). Some adolescent girls may believe they are incapable of becoming pregnant, despite their

knowledge about human reproduction. They tend to believe that pregnancy happens to other people, and not them.

Another possible manifestation of the personal fable is the gambler's fallacy (Cvetkovich, Grote, Bjorseth, & Sarkissian, 1975). The gambler's fallacy refers to the belief that the likelihood of an event occurring strengthens over time and with each occurrence. Thus, adolescents who buy into the gambler's fallacy believe that the risk of contracting an STI or becoming pregnant increases with each sex act. Since the sexual behavior of adolescents tends to be sporadic and infrequent, they may develop a sense of safety based on a misunderstanding of probability.

Research has supported the relationship between the endorsement of the personal fable and contraceptive use (Arnett, 1990; Pete & DeSantis, 1990). Pete and DeSantis conducted interviews with five African-American adolescent mothers to see what influenced their decision to not use contraceptives. One common theme was that the young women believed they would not get pregnant, despite their nonuse of contraception. Arnett measured the ascription of the personal fable by using two questions designed to assess the perceived likelihood of pregnancy. Adolescent girls who scored high on the personal fable items underestimated their own probability of becoming pregnant when compared to those who scored low on the personal fable items. Furthermore, virginal girls estimated the risk of pregnancy as higher than those who engaged in sexual intercourse regardless of contraceptive use.

Similar results have been obtained from research conducted on optimistic bias and sexual behavior. Chapin (2001) found that students ranging in age from 10 to 17 perceived their personal risk of becoming pregnant or impregnating someone as

significantly lower than the risk faced by their peers. In addition, he found that sexually inexperienced adolescents were less optimistic about their personal risk than more experienced adolescents, suggesting those who chose to engage in sex did so because of their perceived invulnerability. Chapin also found that adolescents possessed an optimistic bias for developing HIV/AIDS sometime in the future; that is, they estimated their personal likelihood of acquiring the disease as less than their peers.

Understanding the cognitive processes that underlie adolescents' decisions regarding sex is undoubtedly important. However, the complexities of human nature make it impossible to restrict the study of decision-making to cognitive processes alone. Two other concepts have been identified in the research as being potentially important for understanding adolescents' sexual decision-making; they are self-esteem and alcohol use. Existing literature has explored the relationship between self-esteem, alcohol use, and sexual behavior, but many contradictory findings have emerged attesting to the complex nature of adolescents' decision-making process. Examining the issues of self-esteem, alcohol use, and cognitive development together may help to clarify the role each plays in sexual decision-making.

Self-Esteem

Traditionally speaking, low self-esteem has been viewed as a risk factor for many hazardous behaviors engaged in by adolescents, including the non-use of contraception. It was thought that only adolescents who had a low opinion of themselves would intentionally put themselves at risk for unplanned pregnancies and STIs. Holmbeck, Crossman, Wandrei, and Gasiewski (1994) supported this notion when they found that

adolescents with higher levels of self-esteem had more positive attitudes toward contraception and reported more frequent contraception use.

The influence of self-esteem on sexual behavior is more complicated than the above research implies, however. McNair, Carter, and Williams (1998) found that adolescents with high self-esteem tend to perceive their risk for developing HIV as lower than their peers. Unfortunately, actual risk was not measured, so it is not clear if adolescents with higher self-esteem estimate their risk as low because they use protection, or if high self-esteem fuels the attitude of invulnerability. Some research has blatantly challenged the traditional belief that low self-esteem equals reckless behavior. West and Sweeting (1997) asserted that adolescents with low self-esteem may worry more about the risks involved with behaviors such as using alcohol, drugs, and engaging in sex, but are actually less likely to engage in those behaviors than adolescents with high self-esteem.

One construct that complicates the study of self-esteem and its relationship to sexual behavior is gender. Some research has found that adolescent boys and girls with high self-esteem are slightly more likely to engage in dangerous health behaviors such as drinking, using drugs, and engaging in sex than those with low self-esteem (West & Sweeting, 1997). Other research has found that sexual experience differentially affects the self-esteem of adolescent boys versus adolescent girls. For example, Orr, Willbrandt, Brack, Rauch, and Ingersoll (1989) found that levels of self-esteem are similar for virginal boys and girls, while the self-esteem of experienced girls was significantly lower than their male counterparts. Furthermore, there was a significant difference between the

self-esteem scores for the two groups of girls, with the sexually experienced group having lower levels of self-esteem. No such difference was found for the two groups of boys.

Alcohol Use

Another factor that may impact adolescents' sexual decision-making ability is alcohol use. Many studies have shown that there is a relationship between the amount of alcohol consumed by adolescents and sexual behaviors, including onset of sexual intercourse (Cooper, Peirce, & Huselid, 1994; Harvey & Spigner, 1995), first time with a new partner (Cooper, Peirce, & Huselid), the likeliness of using contraception (Fergusson & Lynskey, 1996; Strunin & Hingson, 1992), and having multiple sex partners (Fergusson & Lynskey). The nature of the relationship between alcohol use and sexual behavior remains somewhat unclear. Some research has concentrated on examining the influence of alcohol when it is used concurrently with sexual activity (Strunin & Hingson). Others argue that the risk factors responsible for early and risky sexual behavior are very similar to the risk factors for alcohol use, indicating the relationship between alcohol use and risky sexual behavior is due to common underlying influences (Fergusson & Lynskey; Harvey & Spigner).

Although the nature of the relationship between sexual behavior and alcohol use is not known, previous research has clearly found that a relationship does exist. Strunin and Hingson (1992) conducted phone interviews with over 1,000 adolescents between the ages of 16 and 19, and found that roughly half of the respondents reported they were more likely to have sex if they or their partner had been drinking. In addition, they found that significantly more adolescents reported that they were less likely to use a condom after drinking than those who reported they were more likely to use a condom. Similarly,

Cooper, Peirce, and Huselid (1994) found that substance use produced a significant decrease in condom usage in young adolescents. The same researchers reported that the percentage of sexually active adolescents was much larger in the substance-using group than in the non-using group.

Fergusson and Lynskey (1996) found that gender might have a mediating effect between alcohol use and sexual risk taking. They found that girls who misused alcohol were more likely to engage in sex at an early age, but boys who misused alcohol were more likely to have unprotected sex. There was also a relationship between alcohol misuse and having multiple sex partners that applied to both boys and girls. Harvey and Spigner (1995) found that of all the factors they examined, frequency of alcohol use was the best predictor for sexual activity among boys and girls.

Hypotheses

This study will investigate the relationships between cognitive development, self-esteem, alcohol use and sexual behavior in two different age groups. Three separate constructs related to cognitive development will be explored. They are a) identifying and evaluating alternatives as measured by a temporal discounting instrument, b) adolescent egocentrism as measured by an imaginary audience instrument, and c) estimating chance and probability as measured by an optimistic/pessimistic bias instrument. Self-esteem will be measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Alcohol use will be measured by questions on the demographic questionnaire regarding frequency of alcohol use per month and average amount of alcohol consumed per drinking episode. The sexual behaviors that will be measured are the age of onset of sexual activity,

frequency of contraception use, number of sexual partners, and frequency of sexual intercourse. The following hypotheses regarding these constructs were tested:

1. The scores on the cognitive development measures will reflect significantly more advanced scores for the college sample versus the adolescent sample. In addition, the college sample will have more sexual experience than the adolescent sample.
2. The cognitive development measures, the self-esteem measure, and measures of alcohol consumption will be significant and unique predictors (IVs) of all measures of sexual behaviors (DVs). Higher levels of cognitive development and self-esteem and lower levels of alcohol consumption will be predictive of lower levels of risk in relation to sexual behaviors for both age groups.

CHAPTER 2

METHOD

Participants

Participants consisted of 59 high school students, ages 14 to 17 ($M = 15.94$, $SD = 1.15$), and 41 college undergraduates, ages 18 to 37 ($M = 20.8$, $SD = 4.27$), for a total sample size of 100. Of the high school sample, 51.36% were female, and 79.7% of the students reported receiving mostly As and Bs. The college sample was 72.5% female and 87.5% of the students reported receiving mostly As and Bs. The high school sample was a convenience sample drawn from two rural high schools in cooperation with Project Teen Esteem Enhancement Network (T.E.E.N.), a local agency designed to encourage safe sex practices among adolescents. The college sample was recruited from Introductory Psychology and Developmental Psychology classes. In exchange for their participation, the participants from the college sample received one research point that counted toward a class requirement.

Instruments and Materials

Informed Consent Document. Informed Consent Documents were used to obtain parental/participant consent and adolescent assent to participate in the research (Appendix A).

Demographic Questionnaire. The Demographic Questionnaire was designed by the researcher and included questions regarding age, educational achievement, parental education, alcohol use and sexual behavior (Appendix B).

Imaginary Audience Scale. The Imaginary Audience Scale (IAS; Elkind & Bowen, 1979) is a 12 item inventory designed to measure the extent an adolescent is

willing to expose himself or herself to an audience (Appendix C). It is made up of two subscales: the Transient Self (TS) scale and the Abiding Self (AS) scale. The TS scale describes "potentially embarrassing situations of a momentary sort" (Elkind & Bowen, 1979, p. 39), and the AS scale describes self-revealing situations. For each item, they respondents read the situation and is asked to assume that the situation happened to them. Then, they are asked to circle the response they would have to the situation from three alternatives: an unwillingness to participate, an indifferent attitude toward participation, and a willingness to participate. A score of 0 on an item indicates the respondent is willing to participate, reflecting a low level of the imaginary audience. A score of 1 indicates the respondent is indifferent to the situation and possesses a moderate level of the imaginary audience, and a score of 2 indicates the respondent is unwilling to participate, reflecting a high level of the imaginary audience.

The IAS was shown to have a test-retest reliability of .65 across four grades: participants from grades 4, 6, 8, and 12 were used in the validation study (Elkind & Bowen, 1979). The internal consistency for the IAS was .63 for all four grades, and the IAS was significantly correlated with measures of self-esteem and self-concept.

Life Events Questionnaire-Positive Events and Life Events Questionnaire-Negative Events. Chang, Asakawa, and Sanna (1991) developed the Life Events Questionnaire-Positive Events (LEQ-PE) and the Life Events Questionnaire-Negative Events (LEQ-NE) scales from items on the Life Events Questionnaire (Shrauger et al., 1998). The LEQ-PE and LEQ-NE were designed to measure the phenomena of optimistic and pessimistic bias, respectively (Appendix D). The LEQ-PE measures optimistic bias by requesting that participants estimate the likelihood of a positive event happening to

them versus others within the next two months. The LEQ-NE measures pessimistic bias by asking the participants to estimate the likelihood of them experiencing a negative event versus others within the next two months The LEQ-PE has an internal consistency of .64-.65, and the LEQ-NE has an internal consistency of .62-.70 (Chang, Asakawa, & Sanna, 2001).

Temporal Discounting Measure. The temporal discounting measure (Atteberry & Critchfield, 2002) used in this study yields a current subjective value for each of the following time frames: 1 month, 6 months, 1 year, 3 years, 5 years, and 10 years (Appendix E). Each time frame is represented on a separate flow chart, where the respondent is asked to choose between a larger, delayed reward or a smaller, immediate reward. The respondent's choice on the initial item determines the values of the subsequent questions, until a final value for each time frame is determined.

The discounting value was determined by using the analysis presented by Myerson, Green, and Warusawitharana (2001) which calculates the total area under the discounting curve for each participant based on the subjective values of all six time frames. The area under the curve score is inversely related to the participants' level of discounting; participants who discount at a high level will have a corresponding low area under the curve score and a steep discounting curve. Likewise, a participant who discounts at a low level will have a corresponding high area under the curve score and a relatively flat discounting curve.

There has not yet been a validation study performed on the temporal discounting measure, but the measure has yielded a distribution similar to distributions arrived at through more traditional and time-consuming laboratory procedures (T. S. Critchfield,

personal communication, November 4, 2002). Though the administration of the survey form is a departure from typical laboratory procedures used to measure temporal discounting, the content of the survey is nearly identical to the content in a laboratory administered measure.

Rosenberg Self-Esteem Scale. The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is a ten item Likert-type scale designed to measure a person's determination of his or her value. Each item is answered by the participant choosing one of the following options in response to the statements designed to measure self-worth: 1. Strongly Agree, 2. Agree, 3. Disagree, 4. Strongly Disagree (Appendix F). Items 3, 5, 8, 9, and 10 are reversed, meaning that a score of 4 is given to a response of Strongly Agree, 3 for Agree, 2 for Disagree, and 1 for Strongly Disagree. A high score on the inventory indicates a high level of self-esteem. The RSE has a test-retest reliability of .82-.88 and a Cronbach's alpa of .77-.88.

Procedure

Participants from the high school group were recruited through two local high schools in conjunction with Project T.E.E.N. The researcher obtained a list of all students from the district superintendent, and letters describing the research were sent to parents along with Informed Consent Documents. Students who brought their Informed Consent Documents to school and gave their assent on the day of the research were allowed to participate. Data was collected during Seminar block, which is similar to a study hall. Parental consent was not needed for the adult group, as all participants were over the age of 18. Thus, Informed Consent was obtained directly from the college students. The only

documents with the participants' names were the Informed Consent Documents; they were collected and stored separately from the testing packets to ensure confidentiality.

The testing packets were administered after the Informed Consent Documents were collected. Each participant completed the following instruments in this order: Demographic Questionnaire, the Imaginary Audience Scale, the Life Events Questionnaire-Positive Events and the Life Events Questionnaire-Negative Events, a temporal discounting measure, and the Rosenberg Self-Esteem Scale. Each testing packet was assigned a number for the purpose of analyzing the data, and the completed packets and Informed Consent Documents were stored in a locked office to protect the participants' privacy. The approximate time it took most participants to complete all procedures was 45 minutes.

CHAPTER 3

RESULTS

After the data was collected, it was entered into a computerized spreadsheet in SPSS 11.5, which was the primary software used for data analysis. To assess developmental differences in the sample, *t*-tests were calculated to examine group differences on the measures of cognitive development and sexual behavior. A series of Pearsons *r* were calculated to test potential relationships between the following variables: cognitive development, self-esteem, alcohol use, and sexual behavior. Six multiple regression equations were calculated to test whether variables serving as predictors, or IVs, were unique contributors of variance in the criterion variables, or DVs. An overall alpha level of .05 was used to test for significance and served as the entrance criterion for the regression equations.

Group Differences in Cognitive Development and Sexual Experience

The scores received by the high school sample and the college sample were compared on all measures of cognitive development and all measures of sexual behavior to test the first hypothesis. Results indicated that the first hypothesis was partially supported. The sexually active college sample ($M = 10.51$, $SD = 3.79$) scored significantly higher on the Imaginary Audience Scale than the high school sample ($M = 8.63$, $SD = 3.49$), $t(98) = -2.56$, $p < .05$, indicating less advanced cognitive development. The college sample ($M = 22.37$, $SD = 5.09$) also scored significantly higher on the Self-Esteem Scale than the high school sample ($M = 20.04$, $SD = 6.23$), $t(98) = -1.97$, $p = .05$. Finally, the college sample reported having engaged in significantly more sexual acts in the past thirty days ($M = 6.97$, $SD = 5.95$) than the sexually active high school sample

(M = 2.36, SD = 4.10), t (43) = -2.63, p <.05. The frequency of sexual intercourse per month revealed a similar trend, but results were not significant, t (41) = -1.885, p = .067.

Contrary to predictions, no other significant between-group differences were found on the measures of sexual behavior. The sexually active college sample (M = 1.05, SD = .74) reported a similar number of sexual partners in the past 30 days as the sexually active high school sample (M = .75, SD = 1.04), t(43) = .21, p > .05. In addition, the sexually active college sample (M = 3.45, SD = 3.18) reported similar numbers of lifetime partners as the sexually active high school sample (M = 3.20, SD = 4.31), t(42) = -.22, p > .05.

Cognitive Development and Self-Esteem Correlations

A correlation matrix (Table 1) was constructed using the following variables: the Imaginary Audience Scale (I. A. Score), the Life Events Questionnaire-Positive Events (Optimistic Bias: O. B. Score) and the Life Events Questionnaire-Negative Events Scales (Pessimistic Bias: P. B. Score), the area under the curve temporal discounting measure (T. D. Score), and the Self-Esteem Scale (S. E. Score). The following alcohol measures were also used in the analysis: alcohol use in the past 30 days (Cur. Alc.), frequency of alcohol consumption in a typical 30-day period (Typ. Alc.) and typical number of drinks consumed per drinking episode (Drinks). The following sexual behaviors were entered into the correlation matrix as well: age of first sexual intercourse (Age 1st Sex), number of sexual acts in the past 30 days (Cur. Sex), number of sexual acts in a typical 30-day period (Typ. Sex), number of sexual partners in the past 30 days (Cur. Partner), number of lifetime sexual partners (Partner), and the frequency of contraception use (Contracept).

The cases with missing data were excluded listwise, so a total of 28 cases were used for all correlations.

The correlation matrix revealed that the measures of alcohol consumption were significantly and positively related. The measures of sexual behavior were also significantly and positively related, as would be expected. In addition, there was a significant, positive correlation between the imaginary audience measure and the pessimistic bias measure; participants who scored high on the imaginary audience measure also scored high on the pessimistic bias measure, and participants who scored low on the imaginary audience measure also scored low on the pessimistic bias measure. The imaginary audience measure was significantly correlated with self-esteem in an inverse fashion; students who scored high on the imaginary audience scale tended to score low on the self-esteem measure and vice versa. Finally, pessimistic bias was negatively associated with self-esteem, such that students with high levels of pessimistic bias tended to have lower levels of self-esteem, and students with low levels of pessimistic bias tended to have higher levels of self-esteem.

Two significant relationships were found between the cognitive development measures and measures of sexual behavior. First, there was a negative relationship between self-esteem and the number of sexual partners in the past 30 days. Participants with lower self-esteem tended to have more sexual partners within the past 30 days, while participants with higher self-esteem tended to have fewer sexual partners within the last 30 days. Secondly, there was a positive relationship between the temporal discounting measure and frequency of contraception use, such that participants who engaged in low

Table 1

Correlations Between Cognitive Development Measures, Self-Esteem, Alcohol Use, and Sexual Behavior

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1. Cur. Alc.		.50**	.43**	-.14	.07	.13	-.01	-.35	-.03	.05	.07	.-.03	.08	-.02
2. Typ. Alc.			.79**	-.30	.16	-.09	.26	-.17	.03	.22	.16	-.08	.34	.20
3. Drinks				-.22	.33	.08	.11	-.11	-.14	.23	.20	-.22	.34	.25
4. I.A. Score					-.03	.54**	-.61**	-.09	.15	.00	.04	.29	.04	-.04
5. O.B. Score						.28	.28	-.08	-.04	-.10	-.09	-.28	-.12	.02
6. P.B. Score							-.40*	-.17	-.08	.24	.25	.30	.18	.27
7. S.E. Score								.16	-.10	.18	.15	-.39*	.09	.15
8. T.D. Score									-.13	-.15	-.15	-.05	-.23	.46*
9. Age 1st Sex										.05	.11	.01	-.15	-.11
10. Cur. Sex											.98**	.32	.48**	.40*
11. Typ. Sex												.28	.47*	.35
12. Cur. Partner													.20	.03
13. Total Partner														.01
14. Contracept														

* $p < .05$

** $p < .01$

levels of temporal discounting were less likely to use contraception, and participants with high levels of temporal discounting were more likely to use contraception.

Predictors of Sexual Behavior

A total of six multiple regression equations were utilized with the following behaviors serving as criterion variables: age of first intercourse, frequency of intercourse during the past 30 days, frequency of intercourse during a typical 30-day period, number of sexual partners during the past 30 days, total number of lifetime partners, and frequency of contraception use. The predictors were entered into the equation in a stepwise fashion, so that unique and significant variables accounting for the most variance would be entered first, followed by other variables that contributed significantly and uniquely to the overall model.

The second hypothesis was only partially supported. The regression equations predicting the age of onset of sexual activity, the number of sexual acts in the past 30 days, the number of sexual acts in a typical 30 day period, number of sexual partners in the past 30 days, and total number of lifetime partners were not significant. In fact, not a single predictor variable satisfied the inclusion criteria for any of the above regression models, implying that the predictor variables were weak overall for these criterion variables.

However, a model for predicting frequency of contraception use was significant [$R = .64$, $R^2 = .41$, $F(3, 28) = 5.83$, $p < .01$] and accounted for 41% if the variance. Specifically, the predictor variables that added significantly to the model were temporal discounting, pessimistic bias, and typical alcohol use in a 30-day period. A significant F Change score [R^2 Change = .19, $F(1, 27) = 6.34$, $p < .05$] was obtained after temporal

discounting was entered into the equation (β = .55, t = 3.50, p < .01) in step one. Temporal discounting was the strongest predictor and accounted for 19% of the variance. Step two yielded a significant F Change score [R^2 Change = .12, $F(1, 26) = 4.60$, $p < .05$] when pessimistic bias was entered the equation (β = .40, t = 2.52, $p < .05$). Pessimistic bias accounted for an additional 12% of the variance. In step three, a significant F Change score [R^2 Change = .10, $F(1, 25) = 4.24$, $p = .05$] was obtained when frequency of alcohol use per month was added to the equation (β = .32, t = 2.06, p =.05). No other predictors added uniquely/significantly to the model.

CHAPTER 4

DISCUSSION

The purpose of this study was to examine possible predictors of sexual behavior in adolescents and young adults using cognitive development theory as a framework. The developmental constructs employed in this research were the imaginary audience, optimistic/pessimistic bias, and temporal discounting. In addition, self-esteem and alcohol consumption were examined, as previous research suggested they may be potentially important variables. Data used in the analysis were collected from 59 high school students and 41 college students.

Support for Research Hypotheses

Hypothesis 1 stated that there would be significant differences between the college sample and the high school sample on the cognitive development measures and the measures of sexual experience, with the college sample demonstrating more advanced cognitive development and more sexual experience. This hypothesis was partially supported. The two samples differed significantly on the Imaginary Audience Scale, but in the opposite direction of the prediction. The college sample scored significantly higher than the high school sample on the imaginary audience measure, indicating a higher level of imaginary audience and lower level of cognitive development. The groups differed significantly on the self-esteem measure, with the college students reporting higher levels of self-esteem. The college sample reported engaging in a larger number of sexual acts in the past 30 days than the high school students, and a similar though nonsignificant trend was found regarding the typical number of sexual acts engaged in over a 30-day period. The nonsignificant *t* tests for the cognitive development measures indicate that the

college sample and the high school sample were similar in terms of cognitive development, contrary to expected findings.

Hypothesis 2 stated that each of the cognitive development measures, self-esteem, and all measures of alcohol consumption would be unique and significant predictors of the sexual behaviors. This hypothesis was only partially supported. Using an entrance criterion of .05 yielded nonsignificant equations for five of the six criterion variables.

However, a significant overall model that accounted for approximately 41% of the variance was obtained when predicting frequency of contraception use. The predictors that loaded into the regression equation for frequency of contraception use were temporal discounting, pessimistic bias, and frequency of alcohol use in a typical 30-day period. Specifically, participants with low levels of temporal discounting, high levels of pessimistic bias, and more frequent alcohol use within a typical 30-day period were more likely to engage in risky sexual behavior by using contraception less frequently. It is not surprising that a combination of pessimistic bias and heavier alcohol use were predictive of risky sexual behavior; students who fall into this category may espouse an attitude of, "no matter what I do, bad things will always happen to me," making contraception use irrelevant.

What is surprising is that *low* levels of temporal discounting, when combined with pessimistic bias and more frequent alcohol use, are predictive of risky sexual behavior. Previous research and logic would lead one to predict that high levels of temporal discounting would be related to risky sexual behavior. If temporal discounting really is a measure of impulsiveness, it would stand to reason that people who discount at a higher level would be less likely to use contraception. However, the results of this study do not

support this prediction. In fact, an opposite relationship was found where low levels of temporal discounting were significantly related to the nonuse of contraception.

This finding is particularly difficult to understand given that the college students have already shown impulse control by choosing to attend college. That is, college students have already made the decision to forego the immediate reward of getting a job directly out of high school (and all the material rewards that go with that), to continue with their education to secure a larger reward at a later date. One possible explanation for the puzzling finding of this study might be that temporal discounting is not necessarily a constant phenomenon, and that it varies depending on the situation. Perhaps college students are aware that they have to wait at least four years before they reap the material benefits of their education, and are interested in pursuing smaller, more immediate rewards in light of their perceived "sacrifice."

An alternative explanation for this finding might be that college students are looking toward their future as adults, and realize all the responsibilities that await them once they graduate. Because of these future responsibilities, college students may possess an attitude of entitlement; that is, they may believe that they can behave irresponsibly and/or impulsively now, because they plan to make up for that behavior as adults. Or, they may be so preoccupied with the future that they fail to adequately examine the choices they are making in the present that may affect their future lives as adults.

Whatever the reason for this unexpected finding, it is important to note that the difference in means between the college and high school samples for frequency of contraception use were not drastically different. The mean for the college sample was 1.81, and the mean for the high school sample was 1.13, with "1" representing use of

contraception 100% of the time, and "2" representing contraception use 75-99% of the time. In addition, the college sample reported engaging in sex more often in the past 30 days than the high school sample, so the differences in means for contraception use may be a result of the unequal number of sexual encounters. Because the college sample reported more instances of sexual intercourse, they also have more of an opportunity to not use contraception 100% of the time.

Associated Findings

Identifying and evaluating options. The results of the present study are markedly different than results obtained in previous studies. Goldsmith, Gabrielson, Gabrielson, Mathews, and Potts (1972) found that adolescent females who had well-developed educational or occupational plans were more likely to use contraception than adolescent females with less-developed plans. Likewise, previous research has found that girls who do not use contraception or are already pregnant tend to focus on their immediate situation, failing to take future consequences into account (Blum & Resnick, 1982). The present study found that temporal discounting was the strongest significant predictor for frequency of contraception use; however, low levels of temporal discounting were related to lower levels of contraception use, and high levels of temporal discounting were related to higher levels of contraception use. Farr (1998) obtained the exact opposite results in her undergraduate thesis that examined sexual risk taking and temporal discounting. She found that those who discounted at higher levels were less likely to use contraception, while those who discounted at a lower level were more likely to protect themselves during sexual intercourse.

Another discrepancy that exists between the present study and prior research regarding temporal discounting is whether rates of temporal discounting change with age. Green, Myerson, and Ostaszewski (1999) found that children tend to discount future rewards at higher rates than do adults. In the present study, however, there was not a significant difference in the discounting scores between the adolescent sample and the college sample. This discrepancy is likely a result of the relatively small age gap between the adolescent sample and the college sample in the present study. Due to the small number of sexually experienced young (13 to 15) adolescents in this sample, however, older adolescents (16 to 17) had to be included in the sample to increase the power of the statistical analyses used.

Perspective taking. The results of the present study regarding perspective taking are not congruent with previous research. Holmbeck, Crossman, Wandrei, and Gasiewski (1994) found that adolescent females who reported low levels of the imaginary audience were more likely to use contraception than females who reported high levels of the imaginary audience. Furthermore, previous research has found that adolescents who live on their own are more likely to use contraception (Kanter & Zelnick, 1973), presumably because the authority figures that make up the imaginary audience are further removed from the adolescent. However, the results of the present study do not support these earlier findings; the Imaginary Audience Scale was not a significant predictor of contraception use or any other sexual behavior.

One of the more surprising findings of the current study was that the college sample scored significantly higher than the high school sample on the imaginary audience measure. Piaget (1972) postulated that adolescent egocentrism disappears around the age

of 15 as formal operational thought crystallizes. The results of this study do not support the timetable Piaget outlined for the disappearance of adolescent egocentrism and suggest that cognitive development may be more gradual than Piaget originally thought.

Estimating chance and probability. Previous research has indicated that adolescents who believe they cannot get pregnant are less likely to use contraception. Pete and Desantis (1990) arrived at this conclusion based on five interviews conducted with African-American adolescent mothers, and Arnett (1990) had similar results based on two questions that were created to measure the construct of the personal fable. Chapin (2001) similarly found that adolescents often perceived their chances of becoming pregnant or impregnating someone as significantly less than their peers. The same research also found an optimistic bias for developing HIV/AIDS. The present research did not identify optimistic bias as a significant predictor of any sexual behavior. However, the related phenomenon of pessimistic bias was found to be a predictor for frequency of contraception use, in that respondents who believed negative events were more likely to happen to them were less likely to use contraception. One explanation for this finding could be that respondents with high levels of pessimistic bias engage in some level of self-fulfilling prophecy; they believe bad things will happen to them, so they do not take proactive steps toward preventing these negative events. Then, partly because they did not try to prevent a negative event, the even occurs further reinforcing their tendency toward pessimistic bias.

There has been some research that has compared levels of optimistic bias in adolescents versus adults, and these studies have yielded conflicting results. Whaley (2000) found that adolescents and adults possessed similar levels of optimistic bias when

estimating their personal risk of unplanned pregnancy or risk of contracting an STI. However, Whaley's adolescent sample was made up of college students, who theoretically should be past the developmental characteristic of the personal fable. Arnett (2000) found that adolescent smokers scored significantly higher on a measure of optimistic bias than adult smokers, suggesting levels of optimistic bias might change with age. The current research found no significant differences between the two age groups. Therefore, it still remains unclear if levels of optimistic bias vary according to age.

Self-esteem. The construct of self-esteem has often been tied to the sexual behavior of adolescents, but results of previous research have been contradictory. Some researchers have found that low self-esteem is a risk factor for unprotected sexual behavior (Holmbeck, Crossman, Wandrei, and Gasiewski, 1994), while others have found that adolescents with high self-esteem tend to underestimate their risk for developing HIV (McNair, Carter, & Williams, 1998). The present research found a negative relationship between self-esteem and number of sexual partners in the previous 30 days. Therefore, the current study lends some support to the notion that low self-esteem may be related to some risky sexual behaviors, while high self-esteem is related to more protective sexual behaviors.

Alcohol use. Many studies have documented the relationship between alcohol use and a variety of sexual behaviors including onset of sexual activity (Harvey & Spigner, 1995; Cooper, Peirce, & Huselid, 1994), the number of sexual partners (Fergusson & Lynskey, 1996), and the likeliness of using contraception (Strunin & Hingson, 1992; Fergusson & Lynskey). Alcohol consumption was not a significant predictor for most of the criterion variables, but was a significant predictor for frequency of contraception use.

Participants who reported using more alcohol in a typical 30-day period were less likely to use contraception.

General Conclusions

The present study yielded results that are both consistent and inconsistent with previous research findings. There was one significant regression equation, where low levels of temporal discounting, high levels of pessimistic bias, and more frequent consumption of alcohol served as predictors for frequency of contraception use. In other words, students who focus on the future, who believe bad things are more likely to happen to them, and consume more alcohol per month are less likely to protect themselves during sexual intercourse. The more surprising finding was that not one of the cognitive development measures, self-esteem measure, or measures of alcohol use were predictive of other sexual behaviors, such as age of onset of sexual activity or number of sexual partners. The results of the present study imply that the predictor variables, as they are currently measured, are appropriate for partially predicting the frequency of contraception use, but not the other sex-related behaviors.

Implications for this research are somewhat limited in scope due to the weak effects of most of the predictor variables. Providing students with accurate and realistic odds of unintended pregnancy and STI contraction and making that information personally relevant to them may be a potential intervention that could indirectly influence contraception use. Previous research has found that adolescents who do not have an attitude of invulnerability are more likely to use contraception, while the present study found that those who overestimate their personal risk were less likely to use contraception. It is conceivable that helping students better understand their personal risk

of pregnancy or STI contraction could influence their decisions regarding contraception in a positive way.

Another potential intervention would be to educate young people about the sometimes-deleterious effects of alcohol, especially in regard to sexual behavior. This and findings of other research have found a relationship between alcohol use and risky sexual behavior; perhaps the implementation of programs that emphasize responsible drinking or abstinence could help decrease the rates of risky sexual behavior among high school and college students. If high school and college students used alcohol more responsibly or not at all, they would most likely be better prepared to make important decisions regarding contraception when they arise. Obviously, these suggestions for interventions are speculative in nature and are based on correlational data. However, future research is warranted to determine if such interventions could impact high school and college students' decisions to use contraception.

Limitations

There were several limitations to this study that may account for some of the nonsignificant findings. First of all, the difficulties encountered when procuring an adolescent sample made comparisons between the two groups tenuous at best. During the planning stage of this research, the adolescent sample was to be made up of 13-15 year-olds. However, only a small number of adolescents between those ages completed the research, so the age range was expanded to include adolescents up to the age of 17. While this provided a larger sample size, it also made the division between the high school sample and the college sample less clear. This may help account for the nonsignificant *t*-tests for some of the cognitive development and sexual behavior measures. On a related

note, the relatively small sample size of high school students did not render very many high school students that were sexually experienced, there again limiting the power of the statistical analyses.

Another limiting factor regarding the sample was the population from which it was drawn. All participants in the high school sample were drawn from two very small, rural high schools in the Midwest. In addition, the college sample was drawn from a single university in a moderate-sized Midwestern town. It is likely that very different results might be obtained from larger schools in different geographical areas, so future research in this area could focus on obtaining samples from more diverse and more urban sources.

Finally, another limitation of this study was the instruments used to measure the cognitive development constructs. The instrument utilized to measure imaginary audience, for example, was published in 1979 and several of the items are outdated. However, a more recent instrument could not be found to measure the same construct. In addition, the temporal discounting measure has not yet gone through a validation study. Until this happens, it is impossible to determine whether or not the instrument measures what it purports to measure. Another small limitation of the temporal discounting measure was that a few of the respondents had a difficult time understanding the instructions and filled it out incorrectly, thereby rendering their data useless. Future research utilizing a similar temporal discounting measure could include more detailed instructions on how to properly fill out the measure, and may even offer an example to promote understanding.

Directions for Future Research

Although the results from the present study were limited in scope, the ideas and constructs behind the research are still promising. Future research that can correct some of the problems associated with participant sampling may yield results quite different from the ones reported in this study. First of all, it would be important to have a larger age gap between the college sample and the adolescent sample. If a researcher could obtain a large sample of 13-15 year old adolescents who have had sexual experience, more powerful results may emerge. Secondly, collecting data from several different school districts would be beneficial, especially if data could be collected from urban and rural schools. Likewise, collecting data from several colleges and universities across the country would provide a better picture of the college population as a whole. Lastly, some changes to the cognitive development measures may improve the quality of the current study. Modifying the Imaginary Audience Scale so that its items are up-to-date may make it a more powerful instrument.

Future research could also further explore the relationship between temporal discounting and use of contraception. It would be interesting to see if rates of temporal discounting vary according to the situation and/or the nature of the reward involved. It could be that future perspective taking and temporal discounting vary according to the sensitivity of the situation involved. Sexual activity is a sensitive, personal topic, so it could be that rates of temporal discounting are higher for it versus an impersonal situation, such as choosing between two monetary awards (as in the instrument utilized in this study).

If future research supports the findings of the present study concerning the difference in contraception use between college and high school students, the reasons for the discrepancy should be examined. One way of doing this would be to simply ask the students to list the reasons why they do not use contraception 100% of the time, and then compare the reasons given by the college students to the reasons offered by the high school students. It would also be important to include 18-22 year-old adults who have chosen not to go to college in future studies. College students may view themselves as "stuck" somewhere between adolescence and adulthood, so their decision-making processes may be qualitatively different from both adolescents and adults. However, 18 year-olds who are not attending college and are presumably working would not necessarily experience this in-between stage, so their decision-making processes may resemble those of adulthood more closely.

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APPENDIX A

Informed Consent Document

INFORMED CONSENT DOCUMENT

Decision Making and Risky Health Behaviors

The Department of Psychology and Special Education at Emporia State University supports the practice for human participants volunteering in research and related activities. The following information is provided so that you can decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time, and that if you do withdraw from the study, you will not be subjected to reprimand of any other form of reproach.

The current study will consist of several questionnaires designed to measure various concepts related to decision making. It should take less than one hour for the participant to fill out all questionnaires. A few of the questions will be asking about sensitive information including sexual activity and alcohol use. Most questions will be innocuous and should pose no threat to the participants. All individual information gained through this research will remain strictly confidential. The results of this study will be used to better understand decision-making of adolescents and young adults, especially in regard to sexual activity. The information garnered through this research could aid in the development of more effective sex education programs.

"I have read the above statement and have been fully advised of the procedures to be used in this project. I have been given sufficient opportunity to ask any questions I had concerning the procedures and possible risks involved. I understand the potential risks involved and I assume them voluntarily. I likewise understand that I can withdraw from the study at any time without being subject to reproach."

_____ _____

Participant's signature Date

_____ _____

Parent or Guardian (if participant is a minor) Date

APPENDIX B

Demographic Questionnaire

General Information

The following questions were designed to obtain some general information about you. It is important that you be honest so the results will be meaningful. Remember that no one will be able to figure out which survey belongs to which person, so your responses will be anonymous. If you have any questions, please raise your hand.

1. I am a student enrolled in:
    a. College
    b. High School
    c. I am not enrolled in school (Please skip to Item #4)
2. I am classified as a
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
3. My grades for this year are (circle the most appropriate choice)
    a. Mostly As
    b. Mostly Bs
    c. Mostly Cs
    d. Mostly Ds
    e. Mostly Fs
4. Age: _____ (fill in the blank)
5. Sex: Male Female (Circle one)
6. Who in your immediate family has graduated from college?
    a. No one
    b. Primary father figure only
    c. Primary mother figure only
    d. Both primary mother and primary father figure

7. How many times in the past month have you used alcohol? _____ (fill in the blank) NOTE: Please enter "X" if your answer is: "Not applicable-have never used alcohol" and skip to item #9.

8. How many times do you drink in a typical month? _____ (fill in the blank)

9. How many drinks do you typically have when you party? _____ (fill in the blank)

10. At what age did you first have sexual intercourse? _____ (fill in the blank). NOTE: Do NOT include any instances of unwanted sexual advances for this question. Please enter "X" if your answer is: "Not applicable-have never had sexual intercourse" and go on to the next questionnaire.

11. How many drinks did you have before you had sex for the first time? _____ (fill in the blank)

12. How many times in the past month have you had sexual intercourse? _____ (fill in the blank)

13. How many times in a typical month do you have sexual intercourse? _____ (fill in the blank)

14. How many sexual partners have you had in the past month? _____ (fill in the blank)

15. How many sexual partners have you had all together? _____ (fill in the blank)

16. What type of contraception did you use the first time you had sexual intercourse?

    a. Not applicable-have never had intercourse

    b. None

    c. Condom

    d. Pill

    e. Depo-Provera

    f. Intrauterine device

    g. Other _____

17. When you engage in sex, how often do you use contraception?

    a. Every single time (100%)
    b. Almost all of the time (75-99%)
    c. Most of the time (50-74%)
    d. Some of the time (25-49%)
    e. Almost none of the time (1-24%)
    f. Never (0%)

18. What type of contraception do you use most frequently?

    a. Not applicable-have never had intercourse
    b. None
    c. Condom
    d. Pill
    e. Depo-Provera
    f. Intrauterine device
    g. Other _____

APPENDIX C

Imaginary Audience Scale

Instructions: Please read the following stories carefully and assume that the events actually happened to you. Place a check next to the answer that best describes what you would do or feel in the real situation.

1. You have looked forward to the most exciting dress up party of the year. You arrive after an hour's drive from home. Just as the party is beginning, you notice a grease spot on your trousers or skirt. (There is no way to borrow clothes from anyone.) Would you stay or go home?

___ Go home.
___ Stay, even though I'd feel uncomfortable.
___Stay, because the grease spot wouldn't bother me.

2. Let's say some adult visitors came to your school and you were asked to tell them a little about yourself.

___ I would like that.
___ I would not like that.
___ I wouldn't care.

3. It is Friday afternoon and you have just had your hair cut in preparation for the wedding of a relative that weekend. The barber or hairdresser did a terrible job and your hair looks awful. To make it worse, that night is the most important basketball game of the season and you really want to see it, but there is no way you can keep you head covered without people asking questions. Would you stay home or go to the game anyway?

___Go to the game and not worry about my hair.
___Go to the game and sit where people won't notice me very much.
___ Stay home.

4. If you went to a party where you did not know most of the kids, would you wonder what they were thinking about you?

___ I wouldn't think about it.
___ I would wonder about that a lot.
___ I would wonder about that a little.

5. You are sitting in class and have discovered that your jeans have a small but noticeable split along the seam. Your teacher has offered extra credit toward his/her course grade to anyone who can write the correct answer to a question on the blackboard. Would you get up in front of the class and go to the blackboard, or would you remain seated?

___ Go to the blackboard as though nothing had happened
___ Go to the blackboard and try to hide the split.
___ Remain seated.

6. When someone watches me work . . .

___ I get very nervous.
___ I don't mind at all.
___ I get a little nervous.

7. Your class is supposed to have their picture taken, but you fell the day before and scraped your face. You would like to be in the picture but your cheek is red and swollen. Would you have your picture anyway or stay out of the picture?

___ Get your picture taken even though you'd be embarrassed.
___ Stay out of the picture.
___ Get your picture taken and not worry about it.

8. One young person said, "When I'm with people I get nervous because I worry about how much they like me."

___ I feel like this often.
___ I never feel like this.
___ I feel like this sometimes.

9. You have been looking forward to your friend's party for weeks, but just before you leave for the party your mother tells you that she accidentally washed all your good clothes with a red shirt. Now all your jeans are pink in spots. The only thing left to wear are your jeans that are too big and too baggy. Would you go to the party or would you stay home?

___ Go to the party, but buy a new pair of jeans to wear.
___ Stay home.
___ Go to the party in either the pink or baggy jeans.

10. Suppose you went to a party that you thought was a costume party but when you got there you were the only person wearing a costume. You'd like to stay and have fun with your friends, but your costume is very noticeable. Would you stay or go home?

___ Go home.
___ Stay and have fun joking about the costume.
___ Stay, but try to borrow some clothes to wear.

11. Let's say you wrote a story for an assignment a teacher gave you, and she asked you to read it aloud to the rest of the class.

___ I would not like that at all.
___ I would like that but I would be nervous
___ I would like that.

12. If you were asked to get up in front of the class and talk a little bit about your hobby . . .

___ I wouldn't be nervous at all.
___I would be a little nervous.
___I would be very nervous.

APPENDIX D

Life Events Questionnaire-Positive Events and

Life Events Questionnaire-Negative Events

Instructions: Following is a list of events involving different aspects common to life. You are to compare the likelihood of an event happening to you versus the likelihood of the event happening to someone like you over the next two months. Circle the most appropriate response.

1. Try to learn a new skill (e.g., cook a new dish, play a new sport, play a new instrument).

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

2. Change your physical appearance (weight, dress, hairstyle, etc.) in a specific way you like.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

3. In a group of at least five people, make a joke or humorous comment at which they laugh.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

4. Go on three or more dates with the same person.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

5. Buy something costing more than $100 that you very much wanted.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

6. Be sent money by a relative for something other than routine expenses.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

7. Meet someone new with whom you expect to be close friends for years.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

8. Leave the local area (on pleasure) for at least two days.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

9. Attend a live concert or performing arts show that you enjoy.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

10. Save more than $20 on a major purchase.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

11. Give a party in which more than 10 people attend.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

12. Join a club or team in which you feel you will remain for at least a year.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

13. Attend a professional or college sporting event.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

14. Do some type of volunteer work.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

15. Feel a sense of elation after some success or accomplishment.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

16. Fail a test.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

17. Miss an appointment because you forgot about it.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

18. Go into finals with a grade of "C" or below in at least one class.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

19. Fall out of touch with a good friend with whom you normally keep in contact.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

20. Be unable to fall asleep for over an hour due to anxiety or stress.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

21. Have someone complain to you about your performance or behavior.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

22. Feel badly enough about your behavior or physical appearance at a specific occasion that you worried about it the next day.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

23. Spend more than $10 on something that you will never use.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

24. Have a period of a day or more when you get very little done because you feel too down or discouraged.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

26. Turn in a major assignment late.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

27. Be in a situation in which you wish you had said no to someone but did not.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

28. Call a relative and ask to borrow money.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

29. Have an allergic reaction.

More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

30. Be awakened from your sleep by an unpleasant dream.

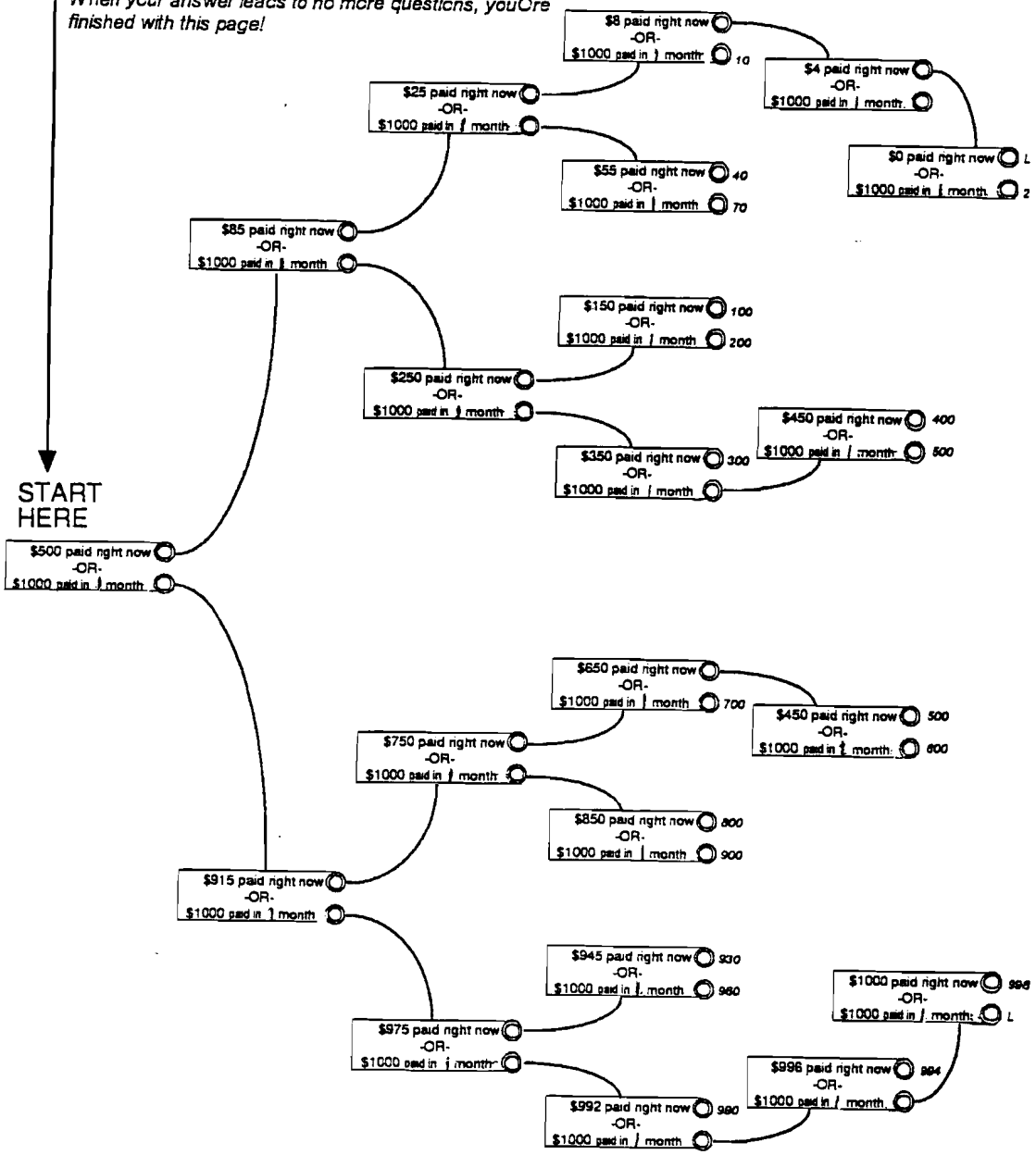
More likely to happen to others than me	Equally likely to happen to me and others	More likely to happen to me than others

APPENDIX E

Temporal Discounting Measure

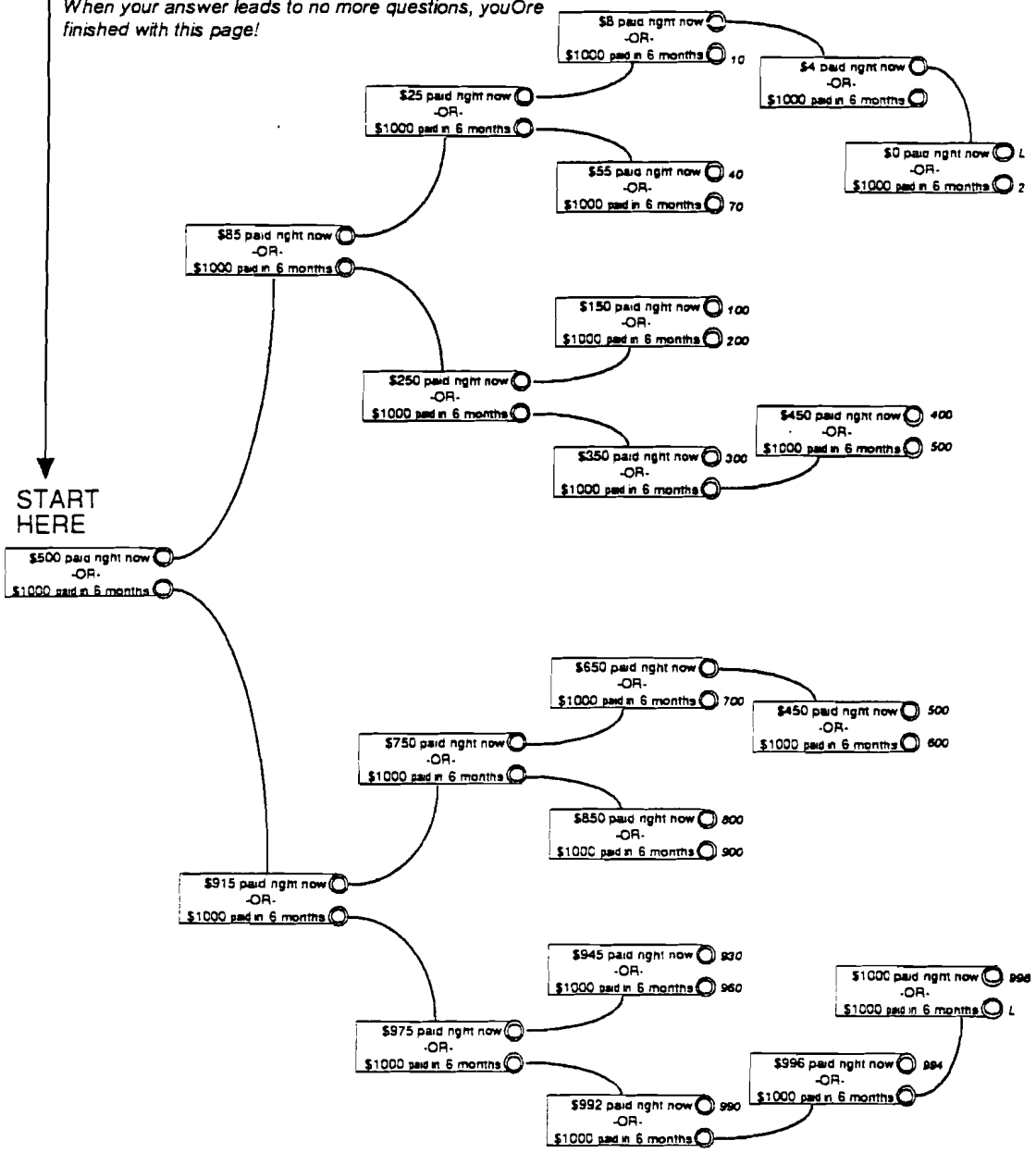
Which would you rather have?

In each box, blacken in the circle beside the money option that you would prefer. Then follow the line that leads from from your answer to the next question. When your answer leads to no more questions, you're finished with this page!



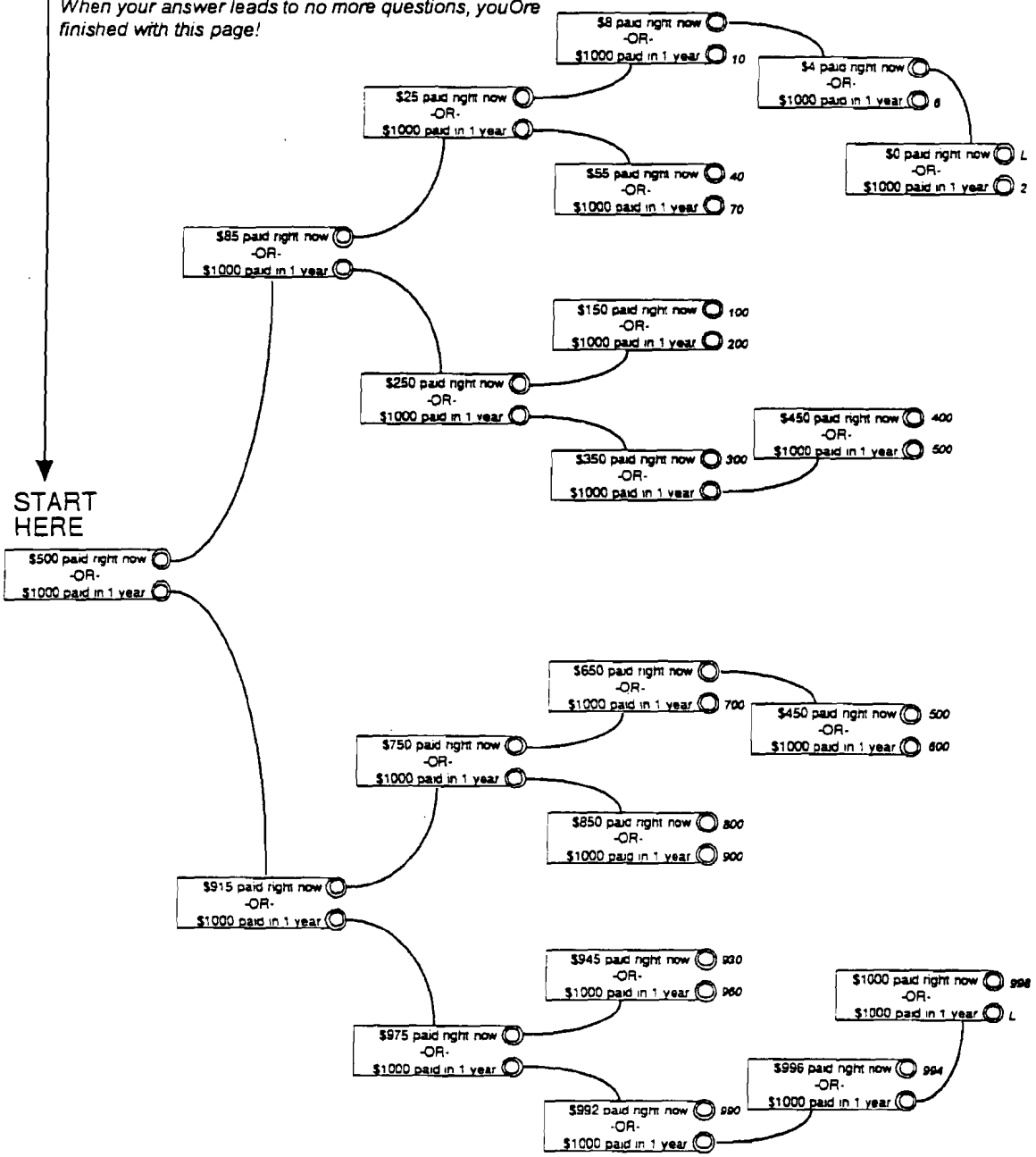
Which would you rather have?

In each box, blacken in the circle beside the money option that you would prefer. Then follow the line that leads from from your answer to the next question. When your answer leads to no more questions, youÕre finished with this page!



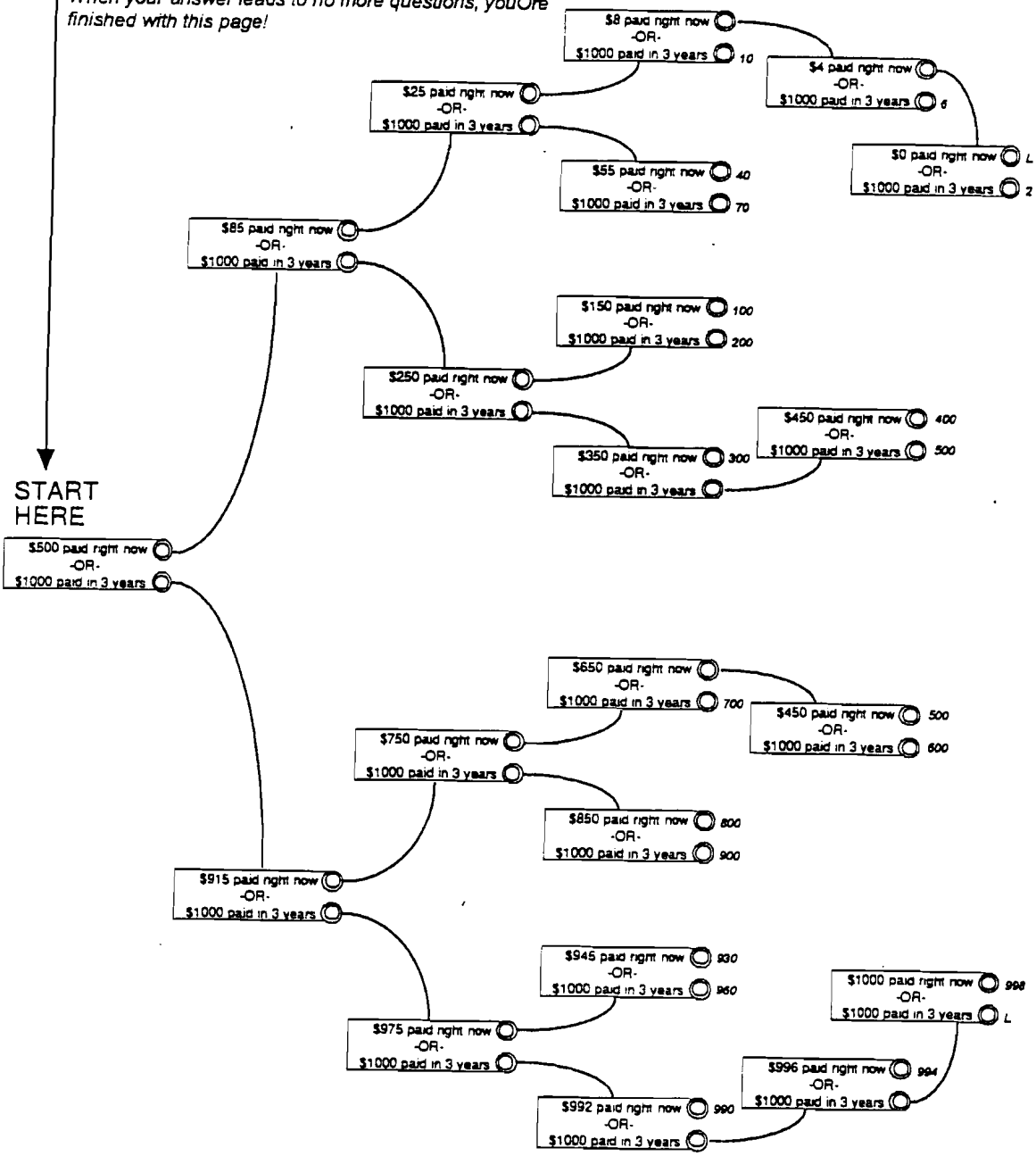
Which would you rather have?

In each box, blacken in the circle beside the money option that you would prefer. Then follow the line that leads from from your answer to the next question. When your answer leads to no more questions, youÕre finished with this page!



Which would you rather have?

In each box, blacken in the circle beside the money option that you would prefer. Then follow the line that leads from from your answer to the next question. When your answer leads to no more questions, youÕre finished with this page!



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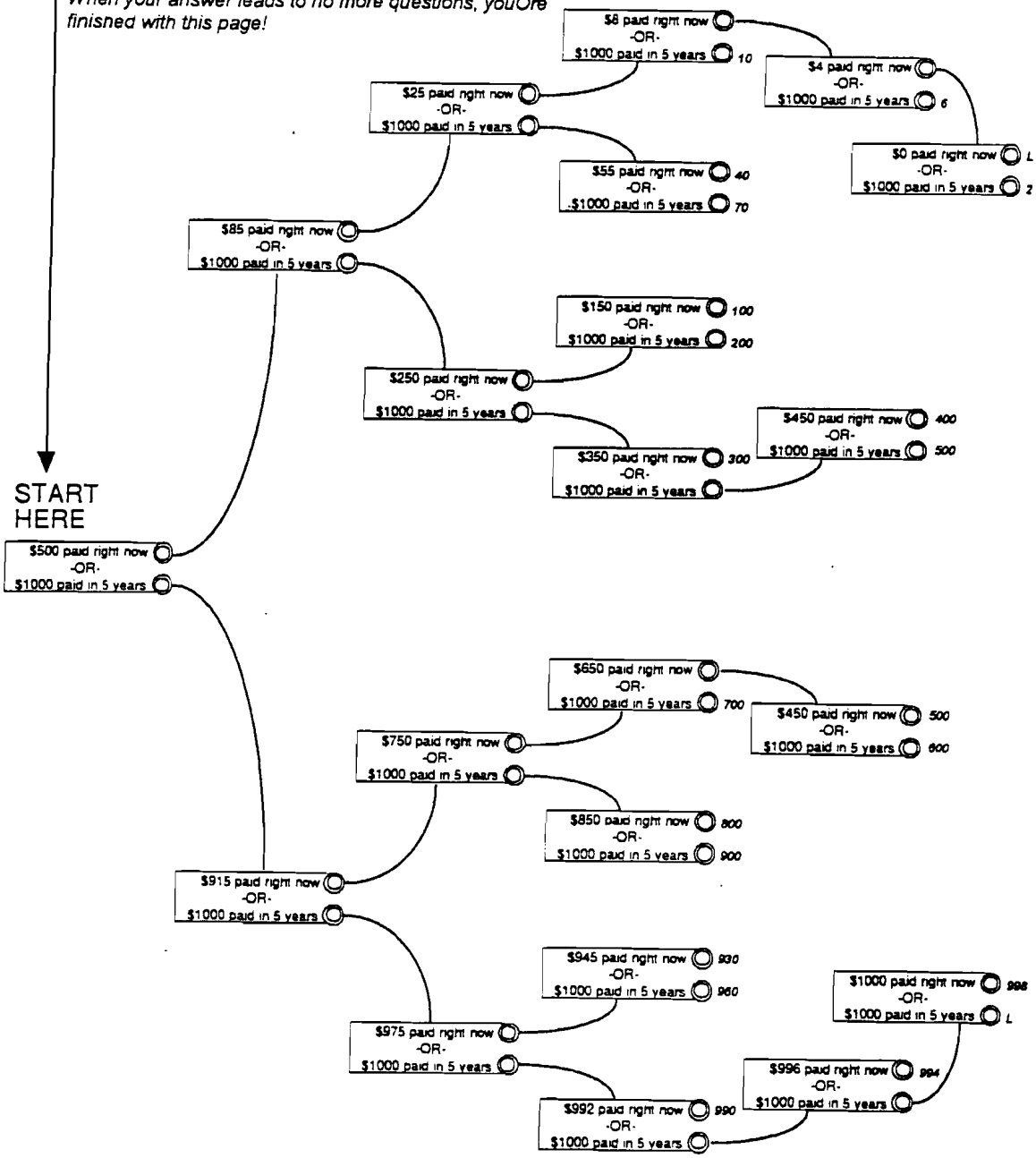
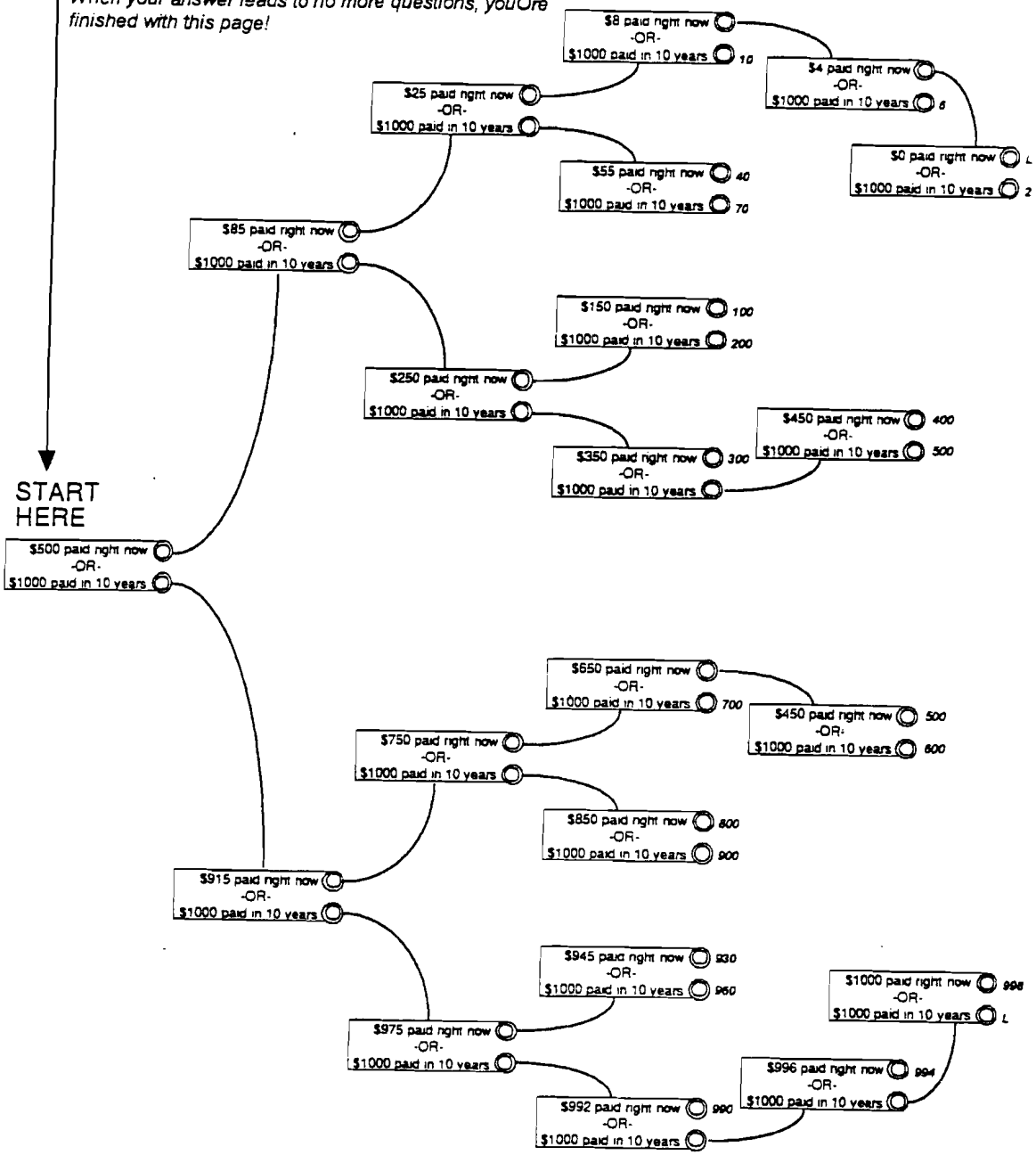


Which would you rather have?

In each box, blacken in the circle beside the money option that you would prefer. Then follow the line that leads from from your answer to the next question. When your answer leads to no more questions, youÕre finished with this page!



APPENDIX F

Rosenberg Self-Esteem Scale

BELOW IS A LIST OF STATEMENTS DEALING WITH YOUR GENERAL FEELINGS ABOUT YOURSELF. IF YOU **STRONGLY AGREE**, CIRCLE **SA**. IF YOU **AGREE** WITH THE STATEMENT, CIRCLE **A**. IF YOU **DISAGREE**, CIRCLE **D**. IF YOU **STRONGLY DISAGREE**, CIRCLE **SD**.

1. I feel that I'm a person of worth, at least on an equal plane with others.
   SA A D SD

2. I feel that I have a number of good qualities.
   SA A D SD

3. All in all, I am inclined to feel that I am a failure.
   SA A D SD

4. I am able to do things as well as most other people.
   SA A D SD

5. I feel I do not have much to be proud of.
   SA A D SD

6. I take a positive attitude toward myself.
   SA A D SD

7. On the whole, I am satisfied with myself.
   SA A D SD

8. I wish I could have more respect for myself.
   SA A D SD

9. I certainly feel useless at times.
   SA A D SD

10. At times I think I am no good at all.
    SA A D SD

I, Valecia Vogts-Scribner, hereby submit this thesis/report to Emporia State University as partial fulfillment of the requirements for an advanced degree. I agree that the Library of the University may make it available to use in accordance with its regulations governing materials of this type. I further agree that quoting, photocopying, or other reproduction of this document is allowed for private study, scholarship (including teaching) and research purposes of a nonprofit nature. No copying which involves potential financial gain will be allowed without written permission of the author.

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The Influence of Cognitive Development, Self-Esteem, and Alcohol Use on the Sexual Behavior of Adolescents and Young Adults

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Date Received