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The Relationship Between Family Functioning And Adolescent Substance Use

by

Vicky R. Bowden

A dissertation submitted in partial fulfillment

of the requirements for the degree of

Doctor of Nursing Science

University of San Diego

1990

Dissertation Committee

Rosemary Goodyear, R.N., Ed.D., Chairperson

Patricia W. Anderson, Ph.D.

June S. Lowenberg, R.N., Ph.D.

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Abstract

This study utilized an explanatory correlational design to examine the relationship which exists between the predictor variables of adolescent's perception of family adaptation, cohesion, and communication, parental use of substances, adolescent age and gender and the criterion variables of adolescent behavioral intention and self-reported use of alcohol, tobacco, and illicit drugs. The theoretical perspectives of the study, derived from developmental theory and the Circumplex Model of Marital and Family Systems viewed the adolescent stage as a period in which the entire family is challenged to balance levels of adaptation and cohesion in order to facilitate individuation and autonomy of adolescent members. Use of controlled substances by adolescents are considered behaviors which may be influenced by patterns of interaction within the family system.

The sample consisted of 306 male and female high school students. Following consent from the student and at least one parent the adolescent was asked to complete four paper and pencil questionnaires. These questionnaires included the Demographic Survey; the Primary Prevention Awareness, Attitude and Usage Scale; the FACES III; and the Parent-Adolescent Communication Scale.

Utilizing measures of central tendency and canonical correlation, the data analysis statistically addressed the relationships between the two variables sets. The findings

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indicated that balanced levels of family functioning and low usage of substances by parents has a strong relationship with decreased substance use by adolescents. Conversely, non-balanced families and those in which parents use substances more often, are families in which the adolescents are more likely to use substances. Age and gender had no significant relation to adolescent substance use or levels of family functioning. Family adaptation, cohesion and communication, and parental role modeling are variables that appear to have a significant impact upon the decisions adolescents make concerning use of alcohol, tobacco products and illicit drugs.

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We have so little faith in the ebb and flow of life, of love, of relationships. We leap at the flow of the tide and resist its ebb. We are afraid it will never return. We insist on permanency, on duration, on continuity; when the only continuity possible, in life as in love, is in growth, in fluidity--in freedom, in the sense that the dancers are free, barely touching as they pass, but partners in the same pattern.

Anne Morrow Lindbergh

To Greg,

For being a constant source of support and strength,

through all of the ebbs and flows

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Through the years, key individuals touch and deeply influence the direction of one's life. Three individuals in particular have made significant contributions to my growth

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Chapter One

The Study Problem

Introduction

Childhood and adolescence represent periods in the evolution of a human being which industrialized societies recognize as a time for the young person to gradually learn and accept the responsibilities of adulthood. For many decades scientific inquiry and philosophical discourse ignored the childhood and adolescent periods. It was believed that the child came into the world as a miniature adult, innately sinful but potentially redeemable (Aries, 1962). Therefore in all respects, children were treated as small adults, and were often severely admonished for their inability to meet adult standards.

With the beginning of modern science this idea was challenged. It became clear that young children had unique characteristics of their own and they were not simply "miniature adults" (Cherry & Carty, 1986; Muuss, 1988). Still, a disparity continued to exist. There were children, and there were adults, however there was little recognition or acknowledgement that several transitional stages existed between the birth of a child and the emergence of a man or woman. In the nineteenth century the theory of evolution changed the perspective of prevalent thoughts concerning

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human development. At this time many theories emerged devoted to explaining the physical and psychosocial process of development from childhood through adolescence, and on towards adulthood. Thus adolescence became accepted as a distinct stage or period of maturation extending from puberty until full adult status has been attained (Muuss, 1988).

Our understanding of the individual progressing through the adolescent period has expanded. The current theories concerning adolescence are numerous and reflect a variety of theoretical orientations including: psychosocial development, cognitive development, sexual development and moral development.

Despite the expansion of knowledge about the individual adolescent, our understanding of the adolescent interacting within the family unit is scanty and biased. An emphasis upon the family as a unit of scientific analysis and theoretical development did not emerge until the mid-1950's (Bowen, 1975; Olson, 1970). As family theories developed adult members served as the primary source of information upon which assumptions concerning family functioning were built. Traditionally, the adolescent was not identified as a primary informer from which to learn about the family's development and level of functioning. Although the adolescent is both an influencer of, and a reactor to, the multiplicity of changes occurring in the family system, his perceptions are thought to be too highly influenced by the

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egocentric, and sometimes hypocritical thoughts and actions that are characteristic of many adolescents (Elkind, 1978). In addition many family theories have been and continue to be developed from data about dysfunctional families seen in both inpatient and outpatient health care services. Thus the ability to predict and understand adolescent behaviors and the interactions within healthy families have lacked a substantive empirical base.

Traditionally adolescence has been described as a period of "storm and stress" by those in Western cultures. More recently investigators have been suggesting that the extent of adolescent and parental turmoil actually experienced during this period has been exaggerated (Douvan & Adelson, 1966; Galvin & Brommel, 1986). Nevertheless, the turbulence which can be, and often is experienced during this period, would seem to be substantiated when one looks at the prevalence of criminal behavior, substance abuse, eating disorders and pregnancy occurring in the adolescent period. Although these actions and behaviors are also prevalent in other age groups, in American society these behaviors are viewed as morally, legally and psychosocially disadvantageous activities for young people.

As health care professionals, as parents, and as members of society we should be appropriately distressed by the prevalence of deviant behaviors in the adolescent population. Substance abuse, destructive behaviors, suicide, and pregnancy are viewed as potentially harmful

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behaviors during the adolescent developmental period. These behaviors are critical indicators that the adolescent is struggling with interpersonal principles of identity, acceptance and nurturance. Furthermore these behaviors represent serious areas of dysfunctional interactions between the adolescent and his family and the adolescent and his community.

Given these premises it is creditable to use our growing understanding of adolescent and family development to observe and analyze adolescent thoughts and feelings which influence actual behaviors. It is also important that adolescents serve as informants about their own behavior and their interpretations of family life. Acknowledging that the family is the most important social unit in the life of an individual, it is appropriate to ask, "How do adolescents perceive their family functioning?" Taking this query one step further, and keeping in mind the prevalence of adolescent self-destructive behaviors, it can be asked, "To what degree are levels of family functioning related to the behavioral intention and self-reported use of alcohol, tobacco products and illicit drugs by adolescents?" The outcomes of this investigation can further identify and begin to clarify the milieu in which adolescent development takes place in the twentieth century. It is through the expansion of our empirical knowledge of adolescent thoughts and behavior that we can better understand how families function and influence individual health behaviors.

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Background

Although schools are actively promoting educational programs to heighten the adolescent's awareness of the potential harm of substance usage, the number of students experimenting with these substances continues to remain quite high. Findings from the National Institute on Drug Abuse (Johnson, O'Malley, & Bachman, 1987, 1988) indicate that by the senior year of high school 92% of all young people have used alcohol, 67% have smoked cigarettes, and 57% have tried some illicit drug. These alarming statistics exist despite the fact that for the adolescent age group, all of these behaviors are considered illegal, as well as harmful to physical and psychological well-being. Although "use of substances" does not necessarily indicate "abuse of substances" the casual and social use of substances has been a predictor of more intense substance use (abuse) with the passing of time. For these reasons, at this point in time, the use of these substances by adolescents is considered by many to be an epidemic (Johnson et al., 1987; Macdonald, 1987).

On the part of the adolescent the confounding issues surrounding substance use are many. For instance, although society gives lip-service to the harmful effects of drinking and smoking, both behaviors are prevalent and widely promoted on primetime television (Barton & Godfrey, 1988; Wallack, Breed, & Cruz, 1987). They are portrayed as glamorous activities which are a necessary part of a fun and

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adventurous life-style. The harmful effects of these substances is rarely demonstrated. This is further intensified by the fact that for many adolescents, the experimental use of alcohol, tobacco, or drugs has few, if any, immediate and visible negative consequences (Zarek, Hawkins, & Rogers, 1987). It is not surprising that under these conditions the adolescent would readily agree to experiment with the products that both friends and family members use and offer to them. Nor is it surprising to read reports which indicate that alcohol, drugs, and smoking are not topics of great concern to adolescents (Riggs & Cheng, 1988; Violato & Holden, 1988).

On the other hand using alcohol, tobacco products, and illicit drugs is an illegal activity in this country. For many families it is also a morally offensive behavior which represents spiritual weakness and self-destructiveness. There are extensive school and government programs teaching that alcohol, tobacco and drug use are destructive addictive behaviors which can have profound negative physical, psychological and developmental consequences (Zarek et al., 1987). There has also been a strong emphasis upon teaching children to not start using alcohol or cigarettes because of the high association between use of these substances and future use of illicit drugs (Morrison & Smith, 1987; Wechsler & Thum, 1973). Never before have substances been so accessible to the adolescent, and never before have our efforts to warn them of their danger been so extensive.

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Into this arena we place the adolescent and his family. The adolescent in this developmental stage is undergoing many behavioral, hormonal, and emotional changes. The adolescent is in a precarious position between being seen as a child and being treated as an adult. The family is significantly affected by these changes and must often struggle to bend and adapt to meet the challenges of this developmental period. It is a period within the family which can be conducive to alienation, confusion and distancing among family members. At the same time, it can be a period in which family members re-evaluate their relationships and come to respect and appreciate the maturing personality of each member.

The influence of the family as a developmental and interactive factor affecting adolescent behavior has been addressed in the behavioral science literature. However, the exact correlates between variables of family functioning and specific adolescent behaviors remain inconclusive. In the case of adolescent substance use, the data is incomplete and warrants a more comprehensive assessment of the relationship between certain family variables and the intention to use and the actual use of alcohol, tobacco products and illicit drugs.

Purpose

The adolescent and his or her family are confronted by numerous factors which challenge the integrity of the family system. Adolescent use of alcohol, tobacco products and

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illicit drugs may be considered a moral, legal, and health issue which can undermine the solidarity of the family as well as the physical and mental stability of the individual. In the same manner it is possible that substance use, from whatever source, may indicate an existing state of family disruption and disunity. In either case, family functioning as demonstrated by the levels of adaptation to change, cohesion, and open communication among family members, may be compromised. In addition the successful progression of the adolescent through this developmental period may be threatened by the lack of family support and unity.

The purpose of this study was to examine the relationship which exists between the adolescent's perception of family adaptation, cohesion, and parent-adolescent communication and behavioral intention and self-reported use of alcohol, tobacco and illicit drugs. In addition the variables of the adolescent age and gender, as well as adolescent's reports of parental usage of substances, were examined as they related to the behavioral intention and self-reported use of alcohol, tobacco products and illicit drugs by the adolescent subjects.

Significance of the Problem

The significance of any nursing research lies in its ability to address an issue which is considered relevant by both society and the profession, and in its ability to contribute to the research, education and practice domains of nursing. Substance use in the adolescent population is a

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major concern of parents and of society in general. Given the enormity of this problem and its correlation with teenage pregnancy, suicide, and diseases such as AIDS (Joshi & Scott, 1988; Mott & Haurin, 1988; Palmore & Shannon, 1988) there can be no doubt that research addressing this issue is both timely and pertinent.

Nursing science is concerned with the diagnosis and treatment of human responses to actual or potential problems (American Nurses' Association, 1980, p. 9). Both the American Nurses' Association (1980) and the National Center for Nursing Research (1988) have identified the areas of health-promotion assessment and intervention as critical issues for study. In particular, special population groups such as adolescents and children are seen as "at risk" and in need of particular focus in order to better understand the mechanisms underlying their health-promotion behaviors (Kulbock, Earls, & Montgomery, 1988; NCNR, 1988).

Substance use, in any amount, and in any form, is a health-compromising behavior. These behaviors exist in a social, clinical and research environment which is focusing more and more upon health-promoting behaviors. In this milieu it is imperative that we continue to analyze the many variables which influence the onset and continuing patterns of substance use by adolescents. Understanding the relationship between family dynamics and adolescent substance use behavior is an appropriate aspect to pursue in light of nursing's emphasis upon family-centered care and

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the perspective that the individual exists in a familial context from which actions cannot be separated.

Investigation in the areas of substance use and family dynamics lacks a strong empirical base in nursing research. Denyes (1983) has stated that the accumulated knowledge base in nursing concerning school-aged children and adolescents has been found to be tenuous and fragmented (p. 47). Nurses pursuing knowledge about family interactions and adolescent behaviors are forced to seek literature in other disciplines to find information about these topics. It is an opportune time for nurses to contribute their unique scientific perspective to the investigation of issues concerning adolescents, drug use and family functioning.

Nurses in the clinical arena are directly involved with adolescents, their families and the consequences of adolescent health-risk behaviors. Nursing research concerning adolescent health issues could greatly benefit the clinician's understanding of family dynamics and the relationship to adolescent health-risk behaviors. In addition professionals dealing with adolescent substance abuse prevention and treatment programs in school, community and clinical settings can utilize the products of this research to focus on the positive and negative factors which will affect program outcomes.

Our knowledge concerning the multiplicity of stressors which affect the adolescent and his family is far from complete. The findings of this study can add to that

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knowledge base and equip us with specific information about the relationships between family functioning and substance use. This information can then be shared with parents, teachers, other health professionals and adolescents themselves. As schools and community groups continue to address adolescent substance use through educational programs, nurses and their growing body of knowledge in this area, can become an integral part of this health promotion and family support process.

In summary, this research investigates the relationship between the adolescent's perception of family functioning and his behavioral intention and reported use of alcohol, tobacco products and illicit drugs. This study reflects issues that have been articulated by both the nursing profession and by society in general as critical focal points requiring further scientific investigation, assessment, and intervention.

Hypotheses

Given the postulate that family adaptation, cohesion, and communication are concepts that effectively measure family functioning, the following research hypotheses are formulated:

1. Adolescent behavioral intention and self-reported use of alcohol, tobacco products and illicit drugs is a function of family adaptation and cohesion, adolescent-father communication, adolescent-mother communication, parental use of alcohol, tobacco products and illicit

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drugs, age and gender.

2. Adolescents who report balanced levels of family adaptation, cohesion and communication will report less behavioral intention and self-reported use of alcohol, tobacco products and illicit drugs.
3. Older adolescents (age 16-18) will report a higher usage of alcohol, tobacco products and illicit drugs than younger adolescents (age 13-15).
4. There will be no difference in the overall amount and frequency of drug use between males and females.
5. Adolescents whose parents use alcohol, tobacco products and illicit drugs will report a higher usage of these same substances than those whose parents do not use these substances.

Operational Definitions

Adolescent: A young person between the ages of twelve to nineteen, currently attending a high school. The adolescent is interchangeably addressed as either him or her in the text in order to be all inclusive and to maintain nonsexist language.

Family: A semi-closed system of interacting personalities who have a sense of history and experience some degree of emotional bonding (Hill & Rodgers, 1964). The family members form a group who have at some point in time made a commitment to nurture each other emotionally and physically, and to share the resources of time, space, and finances. The members of this group may or may not be biologically

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related, and the bonds that unite them may or may not be recognized in the legal arena (Sedgwick, 1981; Smilkstein, 1980).

Family Functioning: The processes occurring within the family system described by the behavioral dimensions of family adaptation, family cohesion and family communication. Central levels of adaptation, cohesion, and communication make for optimal family functioning, while extreme levels of these processes are generally considered to be problematic for a family (Olson, 1988).

Family Adaptation: The ability of a marital or family system to change its power structure, role relationships, and relationship rules in response to situational and developmental stress. The empirical indicators of this concept include: family power (assertiveness, control, discipline), negotiation styles, role relationships and relationship rules (Olson, Russell, & Sprenkle, 1983). The concept will be measured utilizing the Family Adaptation and Cohesion Scale III (Olson, Portner, & Lavee, 1985).

Family Cohesion: The emotional bonding that family members have toward one another. The empirical indicators of this concept include: emotional bonding, boundaries, coalitions, time, space, friends, decision-making, interests and recreation (Olson, Russell, & Sprenkle, 1983). The concept will be measured utilizing the Family Adaptation and Cohesion Scale III (Olson et al., 1985).

Family Communication: The symbolic, transactional process

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families utilize to share their changing preferences, needs and feelings (Barnes & Olson, 1985; Galvin & Brummel, 1986). It is a third dimension of the Circumplex Model which facilitates movement across the other two dimensions of adaptation and cohesion (Olson et al., 1985). Positive communication facilitates movement to different levels of family organization when needed, while negative communication thwarts the family's efforts to change levels of adaptability and cohesion. The concept will be measured utilizing the Parent-Adolescent Communication Scale (Barnes & Olson, 1985).

Use of Alcohol: The adolescent's behavioral intentions and self-reported usage of beer, wine, coolers and liquor. The behavioral intention and the self-reported use of alcohol will be measured utilizing the Primary Prevention Awareness, Attitude and Usage Scale (Swisher, 1989).

Use of Tobacco Products: The adolescent's behavioral intentions and self-reported usage of cigarettes, chewing tobacco and snuff. The behavioral intention and self-reported use of tobacco products will be measured utilizing the Primary Prevention Awareness, Attitude and Usage Scale (Swisher, 1989).

Use of Illicit Drugs: The adolescent's behavioral intentions and self-reported usage of the following illegal drugs: marijuana, inhalants, cocaine, heroin, hallucinogens, "uppers" and "downers." The behavioral intention and self-reported use of illicit drugs will be

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measured utilizing the Primary Prevention Awareness, Attitude and Usage Scale (Swisher, 1989).

Use of Substances: The adolescent's behavioral intentions and self-reported usage of beer, wine, coolers, liquor, cigarettes, chewing tobacco, snuff, marijuana, inhalants, cocaine, heroin, hallucinogens, "uppers" and "downers." The behavioral intention and self-reported use of illicit drugs will be measured utilizing the Primary Prevention Awareness, Attitude and Usage Scale (Swisher, 1989).

Behavioral Intention: The adolescent's stated attitude toward the willingness to try or to use alcohol, tobacco products and/or illicit drugs. The behavioral intention to use any of these substances will be measured utilizing the Primary Prevention Awareness, Attitude and Usage Scale (Swisher, 1989).

Adolescent Use: Use of some substance a few times a year or more as indicated by a subject on the Primary Prevention Awareness, Attitude and Usage Scale (Swisher, 1989).

Parental Use: Use of some substance at some point in the parent's life as reported by the adolescent on the Demographic Survey.

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Chapter Two

Conceptual Framework and Review of Literature

Introduction

This chapter will begin with a presentation of the family theories which form the conceptual foundation of this study. The analysis of the family unit with an adolescent member will be discussed from the perspective of family developmental theory (Hill, 1971; Hill & Rodgers, 1964). The individual growth of the adolescent, both psychosocially and cognitively, will be addressed utilizing the theories of Erikson, Piaget and Elkind. Linkages between family and individual development will be made and addressed in the broader picture of family functioning using the Circumplex Model. This model hypothesizes the relationships between family adaptation, cohesion and communication, and serves as an appropriate context from which to assess and predict family functioning during various family developmental stages.

The second portion of this chapter contains the review of literature pertinent to the research problem. The primary foci of the literature review are those studies which address substance use in adolescents and those which have been concerned with family functioning, and in particular, family adaptation, cohesion and communication.

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The literature regarding adolescents and alcohol, tobacco and drug use is extensive. The major issues addressed in this body of literature include adolescent attitudes towards drug use, the prevalence of substance use and the social correlates of drug use. Appendix A provides a summary of the substance use/abuse literature and includes information concerning sample size, study focus, variables analyzed and study results. This body of literature will be discussed in terms of the major findings and the strengths and limitations of the research to date. This analysis will provide a framework from which to discuss those specific studies which have addressed the relationships between family variables and substance use by adolescents.

Studies regarding family functioning in families with adolescents will be analyzed in the literature review. Particular attention will be given to the concepts of family adaptation and cohesion in adolescent families, and communication patterns in families with adolescents.

Conceptual Framework

The Developmental Approach to Family Theory

Since the 1950's family theorists have attempted to explain and organize conceptual thoughts about the family from a variety of theoretical perspectives. Several approaches have emerged and have been identified as the primary models from which the family has been studied. These models include the following: interactional, structural-functional, situational, institutional,

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developmental/family life cycle, systems model and role structure model (Christensen, 1964; Friedman, 1986; Hill, 1971; Jones & Dimond, 1982; Nye & Bernardo, 1981).

Each of these theories views the family from a distinctive framework which accentuates varying aspects of family life and family interactions. For the purpose of this study, the developmental approach is utilized as the framework for analyzing the adolescent and his or her family. The theoretical foci of this framework centers upon a perception that the family is a unit which changes over time as a result of the physical and psychosocial transitions of both adult and child members.

The developmental framework is not considered a unique approach to family theory, rather it is a synthesis and logical expansion of several conceptual ideas found in other models such as the interactional, institutional, and structural-functional theories (Hill, 1971; Hill & Rodgers, 1964; Jones & Dimond, 1981). The framework is original in its attention to the longitudinal career of the family.

Several family theorists have developed this theme through the explication of stages of the family life cycle. Table 1 identifies stages of the family life cycle that have emerged since 1931. The consensus among these theories is that each stage is separated from the next by the amount of family transition which is required by a particular life event (Nock, 1981; Rowe, 1981). These family transitions are considered "normal" and they carry implications for

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Table 1

Delineation of the Stages in the Family Life Cycle

FAMILY CYCLE STAGE	SOROKIN, ZIMMERMAN, AND GILPIN (1931)	NATIONAL CONFERENCE ON FAMILY LIFE (1948)	DUVALL (1957, p. 8)	FELDMAN* (1961, p. 6)	RODGERS (1962, pp. 64–65)
I	Starting married couple	Couple without children	Couple without children	Early marriage (childless)	Childless couple
II	Couple with one or more children	Oldest child less than 30 months	Oldest child less than 30 months	Oldest child an infant	All children less than 36 months
III		Oldest child from 2½ to 5	Oldest child from 2½ to 6	Oldest child at preschool age	Preschool family with (*a*) oldest 3–6 and youngest under 3; (*b*) all children 3–6
IV		Oldest child from 5 to 12	Oldest child from 6 to 13	All children school age	School-age family with (*a*) infants, (*b*) preschoolers, (*c*) all children 6–13
V		Oldest child from 13 to 19	Oldest child from 13 to 20	Oldest child a teenager, all others in school	Teenage family with (*a*) infants, (*b*) preschoolers, (*c*) school-agers, (*d*) all children 13–20
VI	(III) One or more self - supporting children	When first child leaves till last is gone	When first child leaves till last is gone	One or more children at home and one or more out of the home	Young adult family with (*a*) infants, (*b*) preschoolers, (*c*) school-agers, (*d*) teenagers, (*e*) all children over 20
VII	(IV) Couple getting old with all children out	Later years	Empty nest to retirement	All children out of home	Launching family with (*a*) infants, (*b*) preschoolers, (*c*) school-agers, (*d*) teenagers, (*e*) youngest child over 20
VIII				Elderly couple	When all children have been launched until retirement
IX			Retirement to death of one or both spouses		Retirement until death of one spouse
X					Death of first spouse to death of the survivor

* Feldman enumerates Stages IX, X, and XI to classify childless families to correspond to families with children in the stages of childbearing, childrearing, empty nest, and old age (Stages II to VIII).

Note. From "The Developmental Conceptual Framework to the Study of the Family" by G. Rowe, 1981, in F. Nye and F. Bernardo (Eds.), Emerging Conceptual Frameworks in Family Analysis (pp. 208-209), New York: Praser.

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individual members who must critically assess their own well-being and alter their role functions and expectations to meet the changing developmental tasks of the family over the life course. Thus an interdependence exists between the sequential developmental tasks of the family and those of the individual (Phipps, 1980).

The family is expected to expand and contract its configuration with the addition and emancipation of children. With these changes in family configuration and organization there will be family life events which will often be marked by feelings of tension, anxiety, uncertainty and loss. Stages in the family life cycle are therefore viewed as critical periods of role transition and change in which members are called to adjust, reorganize, consolidate and adapt to meet the changing needs of maturing individuals in the family unit.

Basic Assumptions of Family Developmental Theory

The family developmental theory is based upon several important assumptions or concepts. The first assumption is that the family is a semi-closed social system made up of interacting personalities (Hill 1971; Rowe, 1981).

Utilizing principles from systems theory it can be said that the interrelationships within this system are so intricately tied together that change in any one part invariably results in change in the entire system (Friedman, 1986). In addition the family is not entirely independent of other social systems, indeed it must often carefully

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balance meeting the needs of the external society with the internal needs and demands of its members (Hill, 1971; Rowe, 1981).

The second assumption upon which the developmental theory is built is that each family member has specific positions, roles and normative expectations which they need to fulfill at various points along the family life cycle. Position refers to the location of the family member in the family structure, i.e., husband-father and wife-mother. Roles are defined as a set of behaviors which are normatively defined by a culture for a person occupying certain positions. Norms are the role behavioral expectations commonly shared by family members (Rowe, 1981, p. 204). In developmental theory it is assumed that family members will change their positions, roles and norms at various stages in the cycle in order to accommodate the changing needs of the family members and to maintain family stability. It should be noted that family positions, roles and norms often vary greatly from family to family and from culture to culture. And although it is not possible to identify the numerous variations of these concepts within all families, social scientist have observed dominant family configurations and family activities which are identified as normative for certain populations.

A third assumption of this theory is that there are certain predictable individual and family life cycle tasks that must be fulfilled to facilitate mastery of

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current tasks and to create readiness for successful completion of future tasks (Phipps, 1980; Rowe, 1981). In other words, the ways in which normal developmental tasks, rites of passage, or status transitions are negotiated will affect the outcome and negotiation of future family developmental tasks (Rapoport, 1963).

A forth assumption emphasized in the developmental approach is that the viable family is one that balances morphostatic (low adaptability) and morphogenic (high adaptability) processes in order to achieve balance and stability within the system (Lee, 1988). The more recent approaches to developmental theory emphasize that the family is not homeostatic and can not simply exist to maintain an equilibrium. It is more appropriate to distinguish the family as an interactive system which should demonstrate fluidity and adaptability as the members grow, mature and leave the household.

Lastly, it is assumed that the bonds of cohesion and unity will oscillate within the family system depending upon the developmental staging of the family, and the individual needs of its members (Combrinck-Graham, 1985). It is predicted that at different stages in the family life cycle, patterns of togetherness and independence will emerge and exist in direct relationship to the psychosocial crises and the developmental goals of family members (Olson, 1988).

Families with Adolescents

The period in the family life cycle in which there are

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adolescent family members has been identified as a separate and distinct stage of family development (Duvall, 1977). This period of time has been isolated as a critical point in family life because of the degree of role transitions which must be achieved by both the adolescent and their parents. The primary task of the family unit is focused upon successful balancing of teenage freedom and responsibility with parental instincts to protect and shelter the individual who must soon be encouraged to leave the family nest. The family shares a mutual responsibility to assist the individual in coping with changes in body image and sexual identity, developing and testing a personal value system, preparing for productive citizenship and achieving independence from the home (Feldman & Gehring, 1988; Mercer, 1979). To achieve these tasks the family members must renegotiate roles and norms to establish a new balance between the adolescent's separateness from and relatedness to the family system (Feldman & Gehring, 1988).

Families with adolescent members face a cluster of identified stressors. These families struggle with intrafamily strains, financial and business strains, and work-family transitions (Olson, McCubbin, et al., 1983). Increasing family expenses and increased demands upon family time associated with the increased amount of "outside activities" contribute to the difficulties families face during this time period. In addition, as children grow it is expected that the family life cycle will become

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multigenerational. Therefore in reality the family with an adolescent may be experiencing several stage-critical developmental stressors and strains at one time (Combrinck-Graham, 1985; Jurich, Schumm, & Bollman, 1987; Phipps, 1980).

Theories of Adolescence

The study of adolescence is said to have had its beginnings in the work of G. Stanley Hall. Prior to Hall's work in the early 1900's, adolescence was not recognized as a distinct period of human development. Hall (1904) described adolescence as a period of storm and stress in which the adolescent's emotional life oscillated between contradictory tendencies of energy and exaltation, and indifference and loathing. Although contemporary theories of adolescence vacillate between blind acceptance of Hall's assertions and attempts to diffuse theories of adolescent instability, it is widely accepted that the nature of the transitions which must occur during the adolescent period are numerous and challenging. It is also understood that there exists wide variability in the individual adolescent's ability to adapt to the physical, social and emotional changes occurring in and around them.

Erik Erikson, Jean Piaget, and David Elkind are three prominent theorists who have described the developmental tasks of individuals throughout the life span. Their respective theories of social-emotional and cognitive growth are instrumental in the analysis of adolescent behavior, and

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provide an appropriate conceptual basis from which to analyze and interpret the feelings and actions of adolescents. Each of these theorists discusses particular developmental tasks as being "normal" for the adolescent age period. Collectively their theories refute the notion that progression through these developmental tasks is a tacit demonstration of instability and maladaptive behaviors on the part of the individual.

The focus of Erikson's eight stages of development in man centers around the concept of ego-identity. Each of the eight developmental stages is characterized by an identity-related conflict which has two opposing possible outcomes (Erikson, 1950). During the adolescent period the individual is challenged to establish a sense of personal identity while avoiding the dangers of role diffusion and identity confusion. This search for identity involves the establishment of a meaningful self-concept within the context of one's past, present and future experiences.

To achieve a positive outcome of this developmental stage the adolescent must be willing to accept his own past and establish continuity with previous experiences (Muuss, 1988). The adolescent must find answers to the questions "Who am I?", "Where am I going?" and "Who am I to become?" The adolescent is driven to find these answers, and does so by reflecting and clarifying emotions and thoughts with other people, primarily other adolescents.

The adolescent's identity explorations may lead him

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into precarious and potentially dangerous situations. The youth is constantly testing the boundaries of appropriate behavior as defined by family and friends. In the quest to experience life and to establish a unique identity, the adolescent's actions may seem illogical and even self-destructive. During this stage adolescents have to refight many of the battles of earlier years, "even though to do so they must artificially appoint perfectly well-meaning people to play the roles of enemies" (Erikson, 1950, p. 228). It is therefore not surprising to note that parents and siblings now become adversaries rather than friends in the eyes of the adolescent.

Erikson (1950) states that the danger of this stage is role diffusion. Faced with the physiologic and sexual changes within them, some adolescents are unable to connect their past experiences with their newfound roles and sexual identities. Such confusion can lead to delinquent and "outright psychotic incidents" (Erikson, 1950, p. 228).

The cognitive abilities developing during the adolescent period add a powerful tool to assist the youth in achieving their developmental tasks. Throughout human growth these cognitive abilities are influenced by the maturation of the nervous system, the experiences gained through interaction with physical reality, and the influences of the social environment (Muuss, 1988). For the adolescent, physical, experiential and social variables culminate in the youth's ability to achieve the stage of

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formal operations (Inhelder & Piaget, 1958). At this point the adolescent mind is capable of understanding the relationship between reality and possibility, combinational reasoning, and hypothetical deduction. Previous to this stage the young person could visualize reality as the only possibility and therefore could not respond to hypothetical situations. The formal reasoner is able to reverse the relationship between reality and possibility and is thus able to see the multivariate nature of problems and solutions (Berzonsky, 1978).

A hallmark characteristic of this period is the adolescent's egocentrism. The manifestation of egocentrism stems from the adolescent's attempts to adapt his ego to the social environment while at the same time trying to adjust the environment to his ego (Inhelder & Piaget, 1958). The result is a relative failure between distinguishing one's own point of view from the view of the rest of the group. It should be clarified that formal operational thinking is not a necessary condition for adolescent ego identity formation (Berzonsky, 1978; Wagner, 1987). Rather the two exist as complementary processes. Though not totally interdependent, attainment of high levels of cognitive maturation and psychosocial orientation will enhance the adolescent's ability to progress successfully to adulthood.

David Elkind has expanded upon the thoughts of both Erikson and Piaget to give a clearer picture of the linkages between ego identity and cognitive processes and the actions

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of the adolescent. Although certain adolescent actions may frustrate and infuriate adults, Elkind (1978) asserts that these behaviors are consistent when viewed in the context of the adolescent's intellectual processes and social interactions. Four features of teenage thinking which Elkind believes influence how young people think about themselves and their world are the imaginary audience, the personal fable, pseudostupidity and apparent hypocrisy. These processes significantly affect adolescent's attitudes towards their own bodies and health care issues (Elkind, 1984a).

Imaginary audience is the situation created by the adolescent's cognitive ability to think about other people's thinking. However this is coupled with an inability to distinguish between what is of interest to others and what is of interest to self (Elkind, 1978). The adolescent is consumed with what is happening physically and psychosocially within him. The adolescent falsely assumes everyone else is as preoccupied with these same thoughts about his behavior and appearance as he is himself. Thus adolescents surround themselves with an imaginary audience. The imaginary audience helps explain the super self-consciousness adolescents exhibit. Adolescents are always anticipating what others will think of their behavior. It also explains their desires to be the actor and to focus attention upon themselves, thus reinforcing the idea that they are special and others are thinking about them. The

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desire to "look right" in front of others extends to their relationships with their peers. For instance in a context in which all of their friends are smoking and drinking, the self-conscious adolescent will not want to appear different and would therefore be inclined to participate in an activity which in other circumstances the adolescent would not consider doing.

The personal fable states that if everybody is watching you and thinking about you (the imaginary audience) then you must be something very special. The adolescent thinks that she is so special that she is above the natural laws which pertain to others (Elkind, 1967, 1978, 1984a). Only she can suffer and experience intense agony; only she can know the exuberance of love and passion. The personal fable can contribute to problem behaviors when the adolescent comes to believe that she is above being hurt by circumstances that might negatively affect others. In the case of drug use, the adolescent perceives herself as being special and different. Drugs may hurt other people, but not her. This fable is very real to the adolescent; trying to deny its existence or trying to reason with the adolescent who is acting from this mind set is not usually very effective (Elkind, 1984a).

Pseudostupidity exists in the young adolescent learning to control his newly acquired formal operations skills (Elkind, 1978). With the emergence of formal operations the young person is able to conceive many variables of a problem

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and many alternatives to solutions. However this capacity to see options is not coupled with an ability or the experience to assign priorities and to decide which choice is more appropriate than others. Consequently, despite their progressive cognitive skills, their experiential psychosocial skills make them appear stupid. Once again, given a situation in which alcohol is offered to them, despite knowledge of all the consequences which may occur if they take that drink, they may not be able to prioritize the significance of the negative effects of their actions.

The concept of apparent hypocrisy is an example of another conflict between cognitive growth and psychosocial skills. In this case the adolescent is able to conceptualize fairly abstract rules of behavior, however she lacks the experience to see their relevance to concrete behavior (Elkind, 1978). Coupled with the personal fable, adolescents believe that rules that hold for everyone else do not hold for them. A discrepancy between words and actions exists, and adolescents appear quite hypocritical. The adolescent who gets a sponsor and participates in a walk for the lung association will be the same adolescent found in the bathroom at school smoking with his friends.

By the age of 15 or 16 most of these behaviors should be extinguishing. The establishment of identity formation and intimacy formation (Erikson, 1950) cooperates to assist the young person in developing a more realistic concept of himself and of the world. Failure to achieve these tasks

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can result in persistent demonstration of the imaginary audience, the personal fable, pseudostupidity, or apparent hypocrisy by the adolescent. Each of these concepts is a strong motivational force which can explain adolescent thinking and behavior in a variety of situations including that of the choice to use or not use alcohol, tobacco products and illicit drugs.

All of these psychosocial and cognitive processes require time and patience. Unfortunately it is Elkind's belief that today's society no longer provides the adolescent with a period of time to "put together a workable theory of self" (Elkind, 1984b, p. 9). The adolescent is pushed by her parents, by teachers, and by the media to act "mature." Often this premature adulthood is thrown upon them with little time to prepare for these responsibilities, and with little guidance or role modeling from others, especially their own families. Today's parents are highly involved in their own lives, and often in their own personal struggles. Yet it is within the family climate that adolescent development occurs and personal identity finds an anchor (Bell & Bell, 1982). Therefore placing individual development within the context of family development is an appropriate conceptual lens from which to analyze adolescent behavior. In addition, successful achievement of individual and family developmental tasks can be better understood when viewed within the framework of family functioning variables. The Circumplex Model provides one such framework to assess

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three critical dimensions of family behavior across the family life cycle.

The Circumplex Model

The challenge and goal of the family system is to accommodate developmental and situational change and stress, while at the same time preserving its integrity and organizational cohesion (Melito, 1985). A variety of family coping strategies are utilized to facilitate successful accommodation and adaptation to internal and external stimuli. The effects of these activities can be measured in terms of the family's level of adaptation, cohesion, and communication. Olson, Sprenkle, and Russell (1979) have developed a model to assess these three concepts, and thereby attempt to more fully understand how families react to situational and developmental stressors (Figure 1). The Circumplex Model is a matrix which identifies sixteen types of marital and family systems on the two dimensions of adaptation and cohesion. Family cohesion addresses the degree of separateness and connectedness in families. Family adaptability has to do with the extent to which the family is flexible and able to deal with change. Family communication is the third dimension and it facilitates movement on the other two dimensions (Olson et al., 1985).

The model illustrates that there are four levels of cohesion and four levels of adaptation. It is hypothesized that the central or balanced levels of these two concepts make for optimal family functioning. The extremes of

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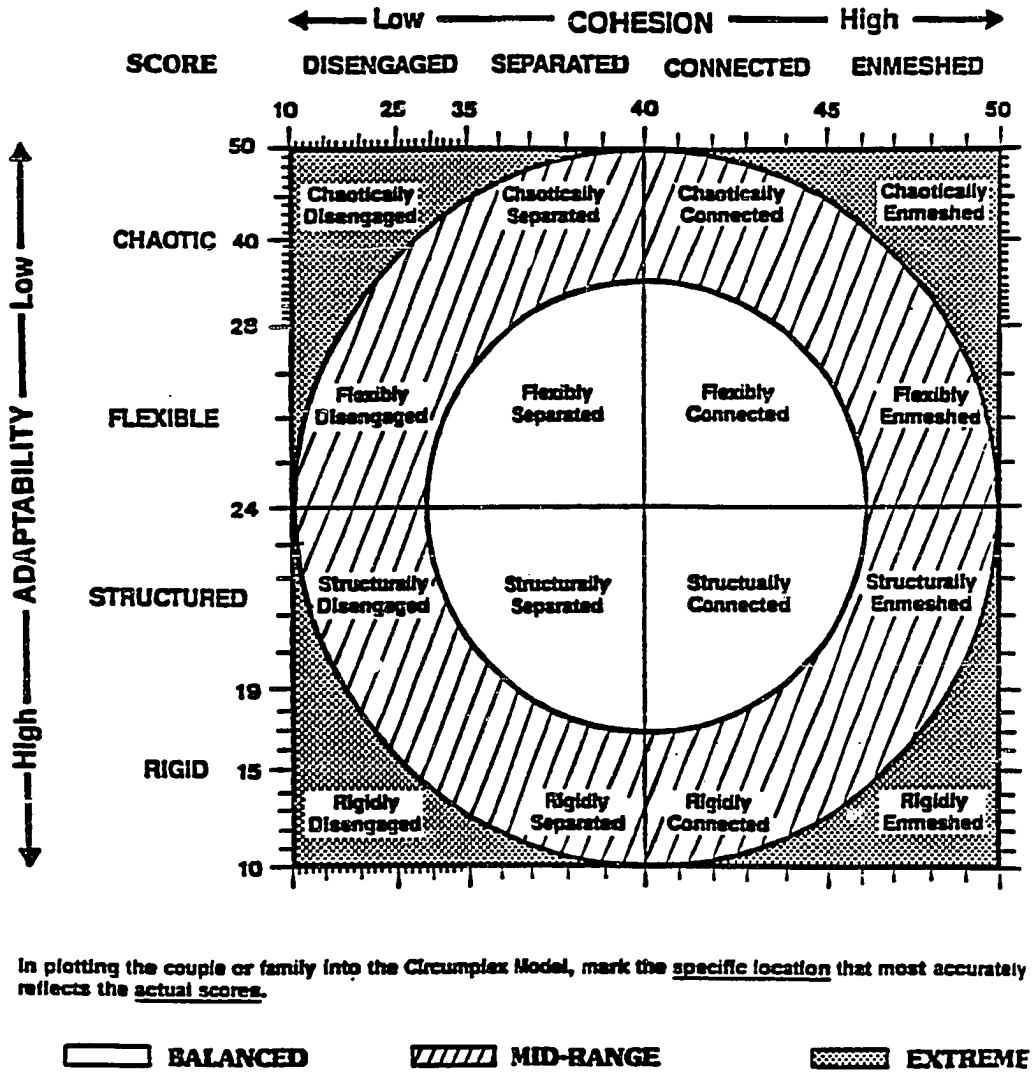
Figure 1. The Circumplex Model of Marital and Family Systems



Note. From FACES III by D. Olson, J. Portner, and Y. Lavee, 1985, St. Paul, MN: Family Social Science.

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cohesion (disengaged or enmeshed) and the extremes of adaptation (chaotic or rigid) are generally viewed as problematic to families (Olson, 1988). Therefore the dimensions are curvilinear, that is, too much or too little adaptability or cohesion is seen as detrimental to family functioning (Russell, 1979).

Levels of family functioning change over time, and as the family passes through different developmental stages. It is hypothesized that families with the central levels of adaptation and cohesion will generally function more adequately across the family life cycle than those families with extreme levels (Olson, 1988). This does not imply that balanced families will always operate within the central levels of the model. Rather, being balanced signifies that the family system can operate at the extremes for short periods of time and when appropriate because of situational and developmental stressors. In these families extremes are tolerated and even expected, yet the balanced family does not continually operate in that fashion. On the other hand extreme family types tend to function only at the extremes, and strongly discourage any deviation from this pattern of functioning by individual members (Olson, 1988).

Communication is a critical dimension of the Circumplex Model as it facilitates movement on the other two dimensions (Olson, 1988). It has been hypothesized that families with central levels of adaptation and cohesion will have more positive communication skills than extreme families. In

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addition positive family communication will enable balanced families to change their levels of adaptation and cohesion more easily than will those families on the extremes. Thus positive communication skills enhance family adaptation to situational and developmental stressors (Galvin & Brommel, 1986; Olson, 1988).

The Circumplex Model builds upon family developmental theory and systems theory to hypothesize that families will change as they deal with normal transitions in the family life cycle (Olson, 1988). These changes can, and should be beneficial to the maintenance and improvement of the family system as the family transforms in composition, role structure and role functioning.

Summary

In viewing the relationship between the adolescent's perception of family functioning and his reported use of alcohol, tobacco products and illicit drugs, it is appropriate to frame this study within the context of individual and family development combined with a family functioning model. The adolescent period in the family life cycle is a challenging time of change for all family members. Levels of family adaptation, cohesion, and communication interact to facilitate, or to hinder the individual and collective transitions which occur within the family system. The conceptual framework provides a theoretical arena from which to analyze the relationships between family functioning and the display of health risk

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behaviors among adolescent family members.

Review of Literature

The Behavioral Intention to Use Substances

Behavioral research has laid a strong foundation for the claim that one's attitudes are likely to predict one's behavior. Such is the case with regard to adolescent substance use. There is strong evidence to support the premise that the intention to use substances is consistently related to the self-reported use of these same substances by teenagers (Atkins, Klein, & Mosley, 1987; Bauman & Bryan, 1983; Forney, Forney, & Ripley, 1988; Maddahian, Newcomb, & Bentler, 1988; Swisher & Bibeau, 1987; Swisher & Hu, 1983). These findings are consistent across demographic areas. Whether the students are from a rural area, a small town, a suburban school or an inner-city urban school, self-reported use increases as the levels of intention to engage in this behavior rises (Wolford & Swisher, 1986). Conversely those students who report negative attitudes toward substances, demonstrate extremely low use levels (Atkins et. al, 1987).

Several organizations have strongly pursued adverse publicity and restrictive legislation to create an atmosphere which discourages the onset and continued use of alcohol, tobacco products and illicit drugs. Despite these efforts, there is evidence which indicates that many adolescents continue to perceive that substance use is not necessarily a health-risk behavior (Bradley, 1984; Johnston et al., 1988; Riggs & Cheng, 1988; Violato & Holden, 1988).

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With these prevalent attitudes it is not surprising to find a large number of the teenage population whose personal attitudes indicate a behavioral intention to use substances.

Although the picture may look quite grim, efforts to dissuade adolescents from utilizing substances should continue. There does exist a population of teenagers who report being strongly influenced by information and programs that are provided to them to facilitate their decision-making process (Forney et al., 1988; Swisher, Nesselroade, & Tatanish, 1985). Based upon the complex factors which affect adolescent attitudes towards substance use, the literature recommends that prevention programs should be comprehensive and utilize a variety of approaches to influence the cognitive and psychosocial factors which can influence behavioral intentions to use substances (Bonaguro, Rhonehouse, & Bonaguro, 1988; Brown & Stetson, 1988; Moskowitz & Jones, 1988; Rundall & Bruvold, 1988).

The Use of Substances

The research regarding substance use in the adolescent population has expanded over the past ten years as social scientists have attempted to document the extent of the "drug problem" in society (Appendix A). Several national household surveys and surveys of high school seniors are conducted on an annual basis (Johnston et al., 1987, 1988; National Institute on Drug Abuse (NIDA), 1988; Smith, 1988). This information from the National Institute on Drug Abuse and other agencies is helpful as school and government

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officials attempt to determine the depth of the problem and the resources necessary to slow its growth. On the other hand, the data can also appear to be conflicting if a focus is made upon the specific numbers rather than the general trends.

The prevalent thought is that adolescent drug use in America is declining (Johnston et al., 1987, 1988; NIDA, 1988; Wolford & Swisher, 1986). However, despite the improvement in recent years, youth in the United States have a higher degree of involvement with substances than in any other industrialized nation (Johnston et al., 1988).

An important phenomenon to discuss concerning substance use is the relationship which exists between the use of one substance and the reported use of other substances (Smith, Schwartz, & Martin, 1989; Wechsler & Thum, 1973; Welte & Barnes, 1987). In particular, use of tobacco products bears a strong positive relationship with the use of all illicit drugs and with alcohol (Ary, Lichtenstein, & Severson, 1987; Earls & Powell, 1988; Johnston et al., 1988). Kandel (1975) has identified stages in adolescent drug involvement. The legal drugs, alcohol and cigarettes, are the first substances to be used. These are usually followed by marijuana and then other illicit drugs (Kandel, 1975; Kandel & Faust, 1975; Yamaguchi & Kandel, 1984a, 1984b)

Alcohol is the most prevalent of all substances to be used by adolescents (Swisher & Bibeau, 1987). As many as 92% of high school seniors are said to have experimented

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with this substance (Johnston et al., 1988). Despite the fact that this figure does not indicate the use of alcohol on a regular and frequent basis, the figure is still quite alarming when one considers that it is illegal for virtually all high school students to purchase alcohol. Cigarettes are usually in second place, followed by marijuana as the most widely used substances (Swisher & Bibeau, 1987).

Adolescents have stated many reasons for using substances. Rationale for use include the desire to achieve enhanced affective states, for excitement, for entertainment, to be with friends, to relax, to deal with boredom and to cope with stress (Binion, Miller, Beuvais, & Oetting, 1988; Smith, Canter, & Robin, 1989; Windle & Barnes, 1988). In addition substances may be taken to inflict deliberate self harm or to attempt suicide (Carter & Robson, 1987).

Age and Substance Use

The age of the adolescent has been associated with substance use. The most substantial findings indicate that the use of alcohol, tobacco products and illicit drugs increases with age, grade level and graduation from high school (O'Malley, Bachman, & Johnston, 1984; Swisher, Shute, & Bibeau, 1984; White & Swisher, 1989; Wolford & Swisher, 1986). Consistent with this data is the fact that older students verbalize more liberal attitudes about substance use than do younger students (Forney et al., 1988).

Initiation of some substances has been noted to start

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at a very early age. Daily smoking is most often initiated in grades six through nine, with rather little initiation after the high school years (Johnston et al., 1988; Kandel & Logan, 1984). Hard substances such as cocaine are usually not initiated until late adolescence and usually by those teenagers who have already been using other substances for quite some time (Johnston et al., 1988; White, 1988).

Gender and Substance Use

Several studies utilized comparative correlation techniques to assess male versus female substance use (Appendix A). Within these studies there is a diversity of findings. A closer examination of these articles reveals that where gender differences occur, they are in relation to specific drugs. However it should be noted that as times passes, gender differences in alcohol and drug use are becoming less significant (Wechsler & McFadden, 1976; Wechsler & Thum, 1973; Winfree, Theis, & Griffiths, 1981).

The national survey conducted by Johnston et al. (1988) found that females were more likely to smoke than their male counterparts in both high school and college. This has been confirmed by several other studies (Earls & Powell, 1988; White & Swisher, 1989; Wolford & Swisher, 1986). Females are also more likely to use stimulants and prescription drugs (Kandel & Logan, 1984; White & Swisher, 1989; Wolford & Swisher, 1986)

Alcohol use has been more prevalent among males than females, although the differences between these two groups

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has been declining (Earls & Powell, 1988; Johnston et al., 1988). Beer in particular is the beverage of choice in the male population (Bauman & Bryan, 1983; Swisher & Bibeau, 1987).

Males are also more likely to use illicit drugs than are females (Brunswick, Merzel, & Messeri, 1985; Johnston et al., 1988). They also report a higher usage of smokeless tobacco and inhalants than do females (Ary et al., 1987; Dent, Sussman, Johnson, Hansen, & Flay, 1987; Elder, Molgaard, & Gresham, 1988; Murray, Roche, Goldman, & Whitbeck, 1988; White & Swisher, 1989).

Social Correlates of Substance Use

Criticism can be given that too much energy has been focused upon the extent of the problem with much less attention focused upon the factors which foster the onset and continued use of substances. For those who have addressed the social correlates of substance use, it quickly becomes obvious that the rationale associated with substance use are complex and include a multitude of psychosocial and sociological components.

Social class has been demonstrated to have a clear cohort effect upon cigarette smoking (Eckert, 1983; Johnston et al., 1988) and alcohol use (Biddle, Bank, & Marlin, 1980). Individuals from low income families were more likely to use these substances. The attitudes within the lower classes are more tolerant and accepting, and in some cases even encouraging of substance use by all family

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members. Such behaviors carry social and symbolic values which may be highly regarded in certain cultural contexts (Eckert, 1983).

Associated with the idea of social class correlates to substance use there is a parallel ethnic group relationship to usage. Overall, Blacks (Brunswick & Boyle, 1979; Brunswick et al., 1985) and American Indians (Binion et al., 1988; Murray et al., 1988; Oetting & Beauvais, 1981; Welte & Barnes, 1987) have experienced a higher usage of substances. Whites more frequently chew tobacco (Dent et al., 1987; Elder et al., 1988; Murray et al., 1988) than any other ethnic group. These behaviors are commonly related to the area in which these young people live. Within their environment specific drugs are either widely available or other more health-promoting activities are not.

Substance use has demonstrated a negative relationship with academic performance and with the amount of time a student spends in certain alternative activities (Atkins et al., 1987; Johnston et al., 1988; Swisher & Bibeau, 1987; White & Swisher, 1989; Wolford & Swisher, 1986). The more time a student spends pursuing academic and religious activities, the less substance use is likely to be reported. On the other hand, those students who indicate a dislike for school and school related activities have a higher use of substances than their more studious peers.

Not all teenage activities are associated with decreased substance use. Attendance at entertainment and

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social activities has been significantly correlated with a higher usage of all substances (Moskowitz & Jones, 1988; Swisher & Hu, 1983), participation and attendance at sports activities are associated with a higher usage of alcohol (Swisher & Hu, 1983), and involvement in vocational activities are associated with higher use of all substances (Swisher & Hu, 1983).

Peer acceptance is very important to the teenager. The need for this acceptance can play a very tangible role in the decision-making process of the adolescent who is choosing to use or not to use alcohol, tobacco or drugs (Bank et al., 1985). Adolescents whose friends use one or more substances are more likely to use these same substances. The evidence supporting these assertions has been well documented in the literature (Ary et al., 1987; Forslund & Gustafson, 1970; Marguiles, Kessler, & Kandel, 1977; Smith, Canter, & Robin, 1989).

Adults who interact with teenagers on a consistent basis can also have a very influential impact upon adolescent substance use. In particular, teachers can play a pivotal role in the decisions students make about substance use. The more students like their teachers, the lower the reported use and intention to use alcohol, tobacco and drugs (Swisher et al., 1984; White & Swisher, 1989; Wolford & Swisher, 1986).

Self-esteem and self-acceptance are important factors which can positively influence the nonuse of substances.

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These variables have a strong relationship to several other related factors such as academic abilities and relationships with peers, parents and other significant adults. Teenagers who feel good about themselves demonstrate a lower use of all substances (Bentler, 1987; Marston, Jacobs, Singer, Widaman, & Little, 1988). Conversely, adolescents who have a negative self-image and who have been subjected to physical and mental abuse have a higher incidence of drug use (Dembo et al., 1987).

It is often difficult to determine whether adolescent behavioral problems are an antecedent or a consequence of substance use. Depression, problem behaviors, increased sexual activity, poor grades and legal problems have all been noted in the adolescent drug using population (Earls & Powell, 1988; Mott & Haurin, 1988; Palmore & Shannon, 1988; Paton & Kandel, 1978; Schwartz, Hoffmann, & Jones, 1987; Smith, Schwartz, & Martin, 1989; Thorton, 1981). These same factors have been viewed by others as predictors of future onset prevalence among certain populations (Marguiles et al., 1977).

Family Variables and Substance Use

The diverse body of interdisciplinary literature reporting adolescent substance use has provided very little information regarding the relationship between family functioning and substance use. From the articles cited in Appendix A, only seventeen assessed family variables. Of these articles the primary extent of investigation into the

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interactional effects of the family upon adolescent substance behavior did not go beyond cursory questions regarding parental usage and attitudes towards adolescent usage. As a whole, the articles reflected a lack of depth concerning specific family qualities which may or may not relate to adolescent usage of substances.

The acknowledgement that a positive relationship exist between family factors and adolescent substance use is bolstered by evidence that other self-destructive behaviors which occur in the adolescent age group have been correlated with impaired and unsupportive family environments. Adolescent depression (Mitchell, Varley, & McCauley, 1988; Robertson & Simons, 1989), adolescent pregnancy (Mercer, 1985), suicide (Neiger & Hopkins, 1988), delinquent conduct (Slocum & Stone, 1959), and poor school performance (Forehand, Long, & Brody, 1986) have, throughout history, been identified as behaviors which, in some respect are influenced by and influencers of, negative family environments.

The family is considered a significant reference group in the life of an adolescent. The values within the family subculture are transmitted to the teenager and influence attitudes and conduct of family members (Forehand, Long, & Hedrick, 1987). The validity of this statement is sustained by the positive relationships which have been found to exist between adolescent substance use and parental substance use (Forslund & Gustafson, 1970; Marguiles et al., 1977; Marston

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et al., 1988; Thompson & Wilsnack, 1987). Although parental behaviors are a stronger predictor of the same behaviors in females than in males, the importance of these role modeling activities can not be discounted (Forslund & Gustafson, 1970; Marguiles et al., 1977; Thompson & Wilsnack, 1987).

Values concerning substance use can vary from culture to culture, and therefore from family to family. Bank et al. (1985) found that parental attitudes about drinking had no relationship to the behaviors of teenagers in France and Norway. This was in contrast to teenagers in the United States and Australia who reported being strongly influenced by their parent's norms. These differences are attributed to a social milieu in which the prevalent attitudes are so strong that they subvert parental role modeling behaviors. In other words, it is possible that societal acceptance of alcohol use by teenagers may be so strong that parental disagreement with this value has little weight in the adolescents decision making process. In addition, substance use is more likely to occur in those environments in which parents withdraw from making strong normative messages about alcohol use.

The structure of the family may have an influence upon adolescent substance use. There is a tendency for adolescents who live with both parents to report less usage of substances when compared to those teenagers from single-parent or stepparent families (Barnes & Windle, 1987; Elder et al., 1988; Murray et al., 1988).

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As noted, parental role modeling is positively related to substance use by the teenager. The influence the parent has upon the adolescent goes beyond the mere imitating of behaviors. An adolescent can see his parents have a glass of wine or beer and know that these behaviors are strictly prohibited by his parents for a person of his age. However, if the adolescent is aware that his parent either mildly or strongly approves or sanctions his use of controlled substances it is more likely that he will use substances himself (Barnes & Windle, 1987; Biddle et al., 1980; Marguiles et al., 1977; Thompson & Wilsnack, 1987). In those families in which there are few rules for adolescent behavior and little pressure to achieve, there are significantly more problems with alcohol and drug use (Block, Block, & Keyes, 1988).

Some disparity exists as to whether or not family closeness and perceptions of parental control have a significant influence upon the initiation of substance use. Marguiles et al. (1977) found that family closeness was not a predictor of alcohol nonuse. Potvin and Lee (1980) found adolescent-parent relationships to be predictive of drug use in early and late adolescence, but not in mid-adolescence (age 15-16). The conclusions of Prendergast and Schaefer (1974) went one step further. These researchers discovered that parental attitudes and behavior toward the child were stronger predictors of adolescent's drinking behaviors than were the parental attitudes toward alcohol or the parent's

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own drinking behavior. Although the literature may portray some conflicting results, a stronger argument can be made to substantiate the claim that the prevalence of adolescent substance use will be higher in those families which demonstrate poor relationships and increased conflict among members (Reynolds & Rob, 1988; Smith, Canter, & Robin, 1989; Thompson & Wilsnack, 1987; Wechsler & Thum, 1973).

Poor family relationships can be a consequence of adolescent drug use. As previously stated teenagers who are highly involved in drug activity are often characterized by numerous problem behaviors, the extent of which have substantial implications upon relations in the home. Still, it is difficult to make a strong case asserting that poor family relations are only an outcome rather than a predictor of substance use. Schwartz et al. (1987) noted that in a population of seniors who smoked marijuana daily, a mean time of 12 months elapsed before parents suspected their child of marijuana abuse. The parental lack of cognizance of these problems existed despite the fact that their children were flunking classes in school, staying out all night, attempting suicide, involved in several car accidents and were encouraging the younger siblings to use marijuana.

Communication, cohesion and adaptation were not addressed in any of the literature as specific family variables which may affect the behavioral intention or reported use of substances by adolescents. Thus although it can be said that the family does influence the choices a

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teenager makes about drugs, our understanding of the nature of these complex familial interactions is superficial and warrants further investigation.

Adaptation and Cohesion in Adolescent Families

Over the years an aggregate of theoretical terms has amassed which represent individualistic approaches to the subject of family functioning. These terms are utilized to identify a variety of family functioning variables which in turn describe functional and dysfunctional patterns within family life. Some of the more popular terms include scapegoating, pseudo-mutuality, clear generational boundaries, disengagement, undifferentiated family ego mass, and family morphostasis (Clements & Buchanan, 1982).

A theme which persists throughout the various family terms and theories is the necessity of maintaining a balance between family togetherness and separateness, individuality and fusion while continually adapting to changing internal and external family needs. Olson and his colleagues at the University of Minnesota have endeavored to inductively isolate and conceptually cluster the numerous cross-discipline terms to describe two, more encompassing dimensions of family life which they call family adaptation and family cohesion (Olson, McCubbin, et al., 1983). This portion of the literature review will focus upon the family functioning literature which addresses these two concepts in families with adolescents.

Several studies have been completed utilizing the

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Circumplex Model and the FACES as a framework for assessment of the adolescent and her family. One of the largest studies was carried out by Olson, McCubbin, et al. (1983) as a part of a cross-sectional research project assessing family functioning across the life span. A portion of the study utilized teenagers and their families to report levels of adaptation and cohesion during the adolescent stage of the family life cycle. Findings from the study confirmed that the adolescent period was considered by these families to be a period in which there existed high levels of stress and tension within the family system. During the adolescent period it was found that parents' reports of family adaptability and cohesion reached their lowest points when compared to all other stages of the family life cycle. In addition, adolescents reported even lower levels of adaptation and cohesion than did their parents. This finding is consistent with other family environment literature in which these general differences between adolescent and parent perceptions have been documented (Callan & Noller, 1986; McDermott et al., 1983; Moos & Moos, 1975; Morrison & Zetlin, 1988; Niemi, 1974; Noller & Callan, 1986; Roelofse & Middleton, 1985).

Despite these findings Olson, McCubbin, et al. (1983) asserts that balanced levels of cohesion and adaptability are necessary for dealing with the endless demands and stresses of the adolescent stage (p. 198). Several authors have established that balanced family types on the

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Circumplex Model are those which function best at the adolescent stage (Garbarino, Sebes, & Schellenbach, 1984; Geber & Resnick, 1988; Olson, McCubbin, et al., 1983; Rodick, Henggeler, & Hanson, 1986; Russell, 1979). Others have challenged this notion, and even contended that the FACES does not adequately measure the clinical extremes of cohesion and adaptation (Walker, McLaughlin, & Greene, 1988).

Supporting the premise that balanced levels of cohesion and adaptation are the most conducive to adolescent development would seem to be further validated by those studies in which adolescents were asked to portray an ideal family. These adolescents consistently describe their ideal family as one in which there was flexibility to change and a balance between separateness and connectedness (Feldman & Gehring, 1988; Geber & Resnick, 1988; Noller & Callan, 1986).

In families with teenagers, balanced families are characterized by high levels of marital and family strengths, low levels of stress, high levels of marital and family satisfaction, and good parent-adolescent communication (Olson, McCubbin, et al., 1983). Families that are cohesive, expressive, and allow for mutual dependence and independence provide an environment which supports positive psychological and social development as well as positive self-esteem of the adolescent members (Bell & Bell, 1982; Burt, Cohen, & Bjorck, 1988; Hauser et al.,

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1984; Hoelter & Harper, 1987; Shulman & Klein, 1982; Walker & Greene, 1987).

Parents and adolescents do not often see eye to eye on the exact levels of adaptation and cohesion within the family system. In the Olson, McCubbin, et al. study (1983) adolescents rated their families as more extreme than did parents; conversely, parents saw their families as more balanced that did the adolescents. Pink and Wampler (1985) found that mothers have perceived more cohesion in their families than adolescents and fathers. Though this same relationship was predicted by Noller and Callan (1986), it was not substantiated by their findings or by those of Friedman, Utada, and Morrissey (1987). Contrary to expectations, both parents wanted the family to be more cohesive than did the adolescent. Adolescents often perceive more rigidity and a lack of freedom to make choices in the family structure than do their parents who see themselves as being very permissive (Stewart & Zaenglein-Senger, 1982). Thus it is not uncommon for parents and their teenagers to differ in their conceptions of parental control: how it is demonstrated, when it is demonstrated, and if it is justified (Jurich et al., 1987; Smetana, 1988). From these studies it is apparent that discrepancies exist in how parents and adolescents perceive the family environment. These discrepancies often tend to exacerbate the existing tensions within the parent-adolescent relationship and escalate the degree of stress and strain in

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the home environment.

Male and female adolescents may differ in their expressions and perceptions of family intimacy. It is most often found that females adolescents not only desire, but have stronger ties and are more intimate with other family members than are adolescent males (Blyth & Foster-Clark, 1987; McDermott et al., 1983; Noller & Callan, 1986). Conversely it has also been found that boys and girls perceive the family similarly in terms of family adaptation and cohesion and member-to-member intimacy (Feldman & Gehring, 1988; LeCroy, 1988; Moos & Moos, 1975).

The gender of the parent may also influence perceived family functioning. Typically the father is seen as less involved in the family than the mother, and as someone who offers little in terms of personal encouragement and verbal support. Thus it is interesting to find that fathers have been found to have a greater impact on adolescent functioning than do mothers (LeCroy, 1988; Peterson, Rollins, & Thomas, 1985). This would indicate that because fathers may not demonstrate strong intimate attachments to their children, when they do share intimacy it can be particularly salient to the young person.

Perceptions of family cohesion and adaptation have been noted to be strongly influenced by the age of the adolescent. Predictably it has been reported that with increasing age adolescents depict decreasing cohesion and decreased perceived power differences (Feldman & Gehring,

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1988; Gehring & Feldman 1988). Younger adolescents are characterized by feeling more satisfied with their family's levels of adaptation and cohesion. In addition these young teenagers rate family adaptation and cohesion in a consistent manner with their parent's scores (Noller & Callan, 1986).

Levels of family adaptation and cohesion have been noted to differ based upon family structure. In particular analysis of stepfamilies indicates that members perceive lower cohesion and lower adaptability than do members of first-marriage families (Pink & Wampler, 1985). Nontraditional families have often demonstrated lower levels of family support and are considered to be a high-risk setting, particularly in adolescence and young adulthood (Garbarino et al., 1984; Hoelter & Harper, 1987; Kennedy, 1985). This has been associated with the knowledge that divorce, remarriage or death of a parent necessarily results in disruption of existing familial relationships, which, temporarily at least, can change the degree of support and cohesion among family members. This finding is further supported by reports which indicate fewer incidents of adolescent deviant behavior are more prominent in biologically intact homes (Forehand et al., 1987; Steinberg, 1987).

The family functioning literature suggests that parents and adolescents view their family in differing ways. The adolescent tends to see the family as lacking in unity and

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adaptive processes. These perceptions have been noted to vary somewhat with age and with gender orientation. Whatever the adolescent's viewpoint, it remains well documented that family relationships play a crucial role in the ability of the family system to adapt successfully to life transitions (Gutstein, 1987). Furthermore in those families which either lack cohesiveness and adaptation, or perhaps display extremely high levels of these qualities, adolescent functioning is compromised (Shulman & Klein, 1982). These young people consistently demonstrate academic difficulties (Forehand et al., 1986), depression (Mitchell et al., 1988), increased psychophysiological symtomology (Walker & Greene, 1987), delinquent behaviors (Rodick et al., 1986), and drug abuse (Friedman et al., 1987).

Parent-Adolescent Communication

Throughout the years family theorists have addressed the impact of parent-adolescent communication on social and cognitive development (Blos, 1941; Cooper & Ayers-Lopez, 1985; Douvan & Adelson, 1966; Elkind, 1984a). However until recently there has been little focus on healthy parent-adolescent communication and its relationship to family functioning. In the context of the family, communication is the bridge which allows renegotiation of roles, functions, and norms between the parent and the changing identity of the adolescent. Communication has been linked as an important element in helping family members strike a balance between separateness and connectedness (Galvin & Brommel,

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1986; Grotevant & Cooper, 1985; Olson, 1988; Olson, McCubbin, et al., 1983; Olson, Russell & Sprenkle, 1983; Olson, Sprenkle & Russell, 1979). It is therefore important to understand the patterns of interaction in family relationships and their relationship to normal and deviant adolescent behavior.

Several studies have documented situations in families with adolescents in which nonfunctional communication patterns are prevalent. These situations include adolescents who display behavioral problems (Alexander 1973a, 1973b; Hawley, Shear, Stark, & Goodman, 1984), adolescents with psychiatric disorders (Doane & Mintz, 1987), and adolescents with learning handicaps (Morrison & Zetlin, 1988). These families demonstrate defensive and aggressive communication towards one another, with no apparent parent-child supportiveness taking place. Parents interact with their teenager in a dominant "parent-to-child" fashion. On the other hand comparative "normal" or "healthy" families demonstrated high levels of reciprocal supportive communication. Parents in these families communicated with their teenager in adult-to-adult patterns, allowing and encouraging openness and independence of thought. This type of positive communication has been found to have a positive correlation to the self-esteem of male and female adolescents (Walker & Greene, 1987).

It is not uncommon for parents to be unaware of any behavioral or emotional problem their teenager may be

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experiencing. Not surprisingly, these families demonstrate poor communication patterns. Stivers (1988) used a sample of non-problem families to look at the relationship between communication, adolescent depression and suicide proneness. What she found was that many adolescents shared thoughts of suicide and depression, however this was not correlated to parents' interpretations of their child's affect. In other words, in seemingly nonproblem families, adolescents are not coping well. Furthermore though they state they have verbalized this to their parents, parents are not hearing the message.

Despite these findings, the correlations between communication and adolescent problems can not be totally supported in a causal relationship. There are families in which high levels of communication are reported in spite of the existence of adolescent behavioral problems. This finding would most likely indicate that increased communication results in the parents' increased awareness of the behavioral problem (Hawley et al., 1984)

Perceptions about family communication vary from member to member based upon the overall quality of the marital relationship. In analyzing the videotapes of their own family interactions, adolescents rate their family members as more anxious, less involved, and less dominant than did other family members (Callan & Noller, 1986). On the other hand the adolescent was rated as less dominant and less involved by all family members. In this study sex of the

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adolescent and the level of marital quality were both factors which correlated with interpretations of levels of anxiety, involvement, dominance and friendliness. Daughters in families with high marital quality expressed higher levels of communication involvement, dominance and friendliness, and low levels of anxiety. The daughters in families with low marital quality reported high anxiety levels and low degree of friendliness. Sons in these same families rated members as more dominant and more involved than did those high in marital quality. It would appear that complex interactions between adolescent gender, marital quality and communication patterns exist in many families. The most salient factor among these variables is the strong positive relationship which exists between marital quality and family communication (Callan & Noller, 1986; Grotevant & Cooper, 1985; Niemi, 1988).

Barnes and Olson (1985) supported the existence of differences in family members' perception of negative and positive communication patterns. Adolescents tend to perceive significantly less openness and more problems with family communication than do their parents. Clearly adolescents view their intrafamilial communication with more negativism than do parents (Olson, McCubbin, et al, 1983; Morrison & Zetlin, 1988).

The nature of familial interactions is complex and varies between mothers and fathers with sons and daughters (Grotevant & Cooper, 1985). The literature strongly

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supports evidence that stronger communication bonds exist between mothers and their adolescent children than with fathers and their children (Barnes & Olson, 1985; Hunter, 1985; Noller & Bagi, 1985; Olson, McCubbin, et al., 1983). It appears that adolescents communicate more often with their mothers in both personal and general areas. Adolescents view these communications more positively than interactions with their fathers. These feelings are consistent with parents' interpretation of the situation. Husband and wives agree that it is the mother who has significantly more open communications with the teenager (Barnes & Olson, 1985; Olson, McCubbin, et al., 1983).

Male and female adolescents have been reported to differ in their communication patterns with their parents. Noller and Bagi (1985) found that females were more likely to disclose more to their mothers than males, and also more to their fathers. Both males and females responses varied between slightly dissatisfied and slightly satisfied feelings about their family's level of communication, with those adolescents higher in self-disclosure feeling the greatest level of satisfaction.

An empirical connection has been demonstrated between communication levels, family adaptation and cohesion, and family satisfaction. Families with better parent-adolescent communication consistently manifest higher levels of family adaptability, cohesion and family satisfaction (Barnes & Olson, 1985; Galvin & Brommel, 1986; La Coste, Ginter, &

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Whipple, 1987; Olson, McCubbin, et al., 1983; Rodick et al., 1986). Communication is viewed as central to the adaptive processes within a family. These research findings support the hypotheses of the Circumplex Model which assert that positive communication skills will enable balanced families to change their levels of cohesion and adaptability to facilitate meeting needs which arise from developmental and situational stressors (Olson, Russell, & Sprenkle, 1983).

The cumulative implications of these findings indicate the importance of family communication as a tool to promote successful developmental adaptation by members and a means by which to encourage a home environment which is supportive and open to change. Families dealing with adolescent behavioral problems consistently demonstrate dysfunctional and dissatisfying communication patterns between family members. Differences in interactions between genders may reflect time allocations by parents as well as societal norms. As more women work outside the home, and as it becomes more accepted for males to display emotionality and sensitivity, fewer gender-related communication differences would be expected in families. Although adolescents tend to have a more negative view of family communication than their parents, all members are in agreement that effective family communication positively reflects upon family adaptation, cohesion and general family satisfaction.

Summary

The literature review has documented the large body of

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research which exists concerning substance use, family functioning and family communication. The substance use literature verifies that there exists a relationship between adolescents' intention to use substances and their subsequent actions with regards to actual use of alcohol, tobacco products and illicit drugs. The choices an adolescent makes about substance use can be both overtly and covertly influenced by a variety of psychosocial and sociological factors. Those variables documented in the literature include social class, ethnic orientation, age, gender, academic performance, involvement in social, sport and work related activities, peer acceptance, parental role modeling and family relationships. Although each of these factors needs to be investigated in more detail, the specific focus of this study are those family variables which may influence an adolescent's desire to use, or not use substances. The literature in this particular area is scanty and often has not gone beyond the issue of parental role modeling. The delicate nature of investigating the intricacies of family relationships has made research in this area particularly difficult.

A review of the adolescent family functioning and family communication literature confirms that the adolescent period can be a difficult transitional period for the family. Parents, adolescents, and their siblings each have unique developmental needs and perceptions concerning how these needs are being met through interactions with other

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family members. Nevertheless, research supports the notion that balanced level of family adaptation and cohesion, and open communication among family members are key ingredients towards meeting individual and family needs for love and security.

Despite the multitude of articles reviewed, gaps continue to exist in our understanding of the complex relationship between family functioning and certain adolescent behaviors. It is time to go beyond the descriptive statistics of adolescent substance use. Given the enormity of the drug problem, it is appropriate to ask adolescents how they feel about their families and to ascertain whether or not these feelings have any relationship to their substance use activities.

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Chapter Three

Methodology

Introduction

This chapter will present the research design, measures and procedures utilized in the collection and analysis of data for this study. A brief explanation of the correlational design is presented with descriptions of the dependent and independent variables. The selected measures with their associated indices of reliability and validity are described. The procedure for recruitment of subjects and data collection is described. Techniques for analysis of the data are summarized. The chapter closes with a discussion of the methodological assumptions and limitations.

Research Design

An explanatory correlational design was used to examine the relationships between adolescent's perceptions of family adaptation, cohesion and communication, adolescent age and gender and the behavioral intention and self-reported use of alcohol, tobacco products and illicit drugs. As a form of multivariate analysis, a correlational design is considered to be both powerful and appropriate for scientific behavioral research (Kerlinger, 1986). This design was appropriate for this study because of its ability to address

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the associations between multiple variables which are obtained from a sample of a designated population and measured at a single point in time (Woods & Catanzaro, 1988). No attempt was made to control or manipulate the research situation.

The review of literature suggested that the variables were related to one another but not necessarily in a causal way. Therefore, a predictive or causal model design was not appropriate. Likewise, a comparative survey design could not be substantiated given the emphasis of this study upon obtaining the adolescent's unique perspective of family functioning. This study clearly emphasized an exploration of relationships and associations rather than causation or comparison. A descriptive correlational design was suitable for examining the identified variables and their many interrelationships (Burns & Grove, 1987).

In this study eight independent or predictor variables and six dependent or criterion variables were selected for analysis (Figure 2). Data concerning the independent and dependent variables was gathered at a single point in time, and variables were analyzed with respect to their relationships to one another.

Measures

The study utilized four paper and pencil measures to obtain information about the independent and dependent variables. These measures were the Demographic Survey; the Primary Prevention Awareness, Attitude and Usage Scale

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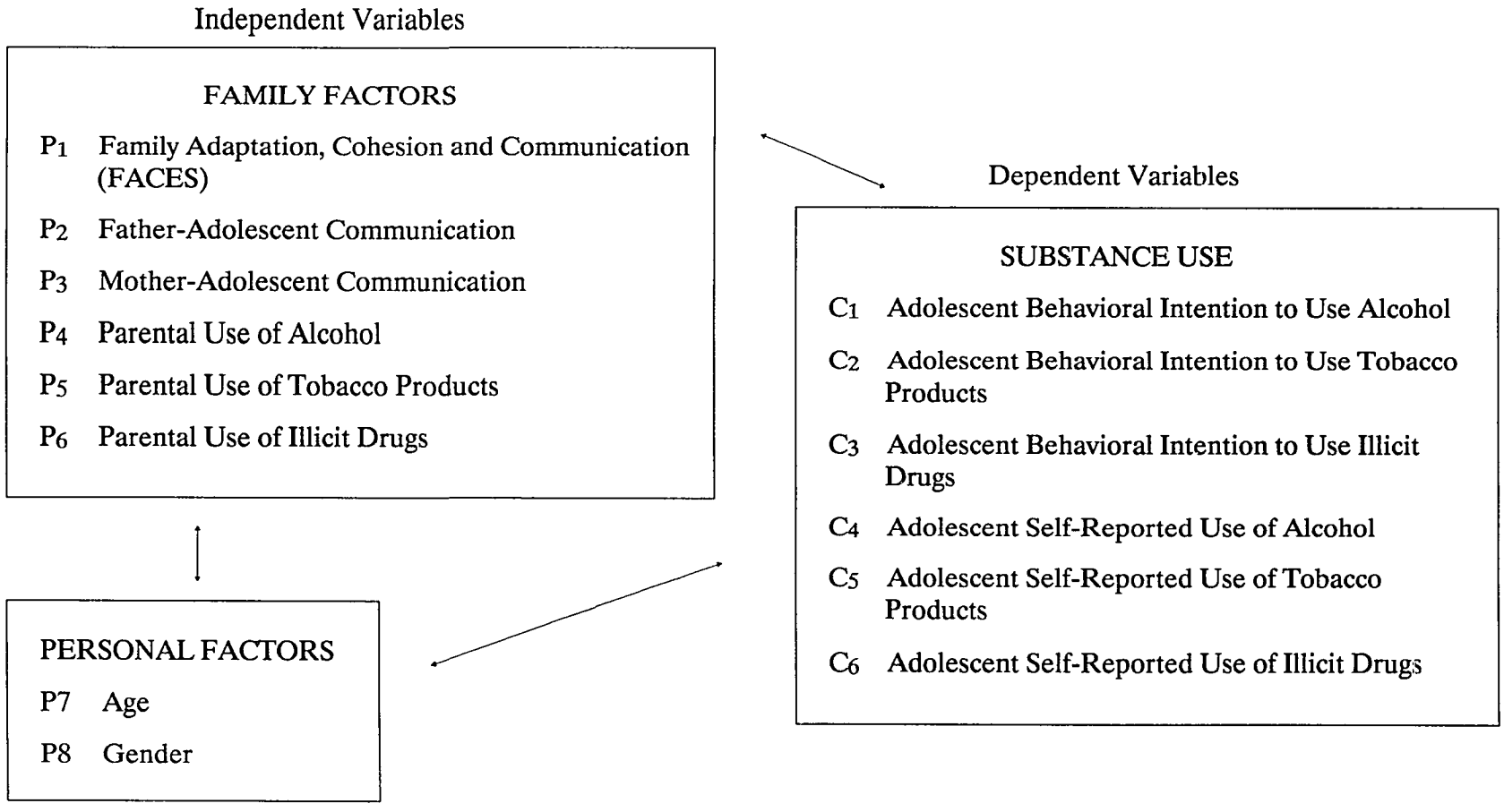
Figure 2

Graphical Representation of the Study Design



(PPAAUS) (Swisher, 1989); the Family Adaptability and Cohesion Scale III (FACES III) (Olson et al., 1985); and the Parent-Adolescent Communication Scale (PACS) (Barnes & Olson, 1985). Each of these measures is briefly discussed. Relevant information concerning the reliability and validity of these scales is presented.

Demographic information was primarily collected on the Demographic Survey (Appendix B). The data obtained was elicited in order to provide a richer profile of the study population. Data regarding the student's ethnicity, family composition and living arrangements was gathered for descriptive purposes only. Information regarding parental usage of alcohol, tobacco products and illicit drugs was collected on the Demographic Survey. As an independent variable, this information was utilized in the canonical correlation matrices, T-tests, and one way analyses of variance as both a composite score of Parental Substance Use and individual scores which represented Parental Alcohol Use, Parental Tobacco Product Use and Parental Illicit Drug Use. The parental use questions on the Demographic Survey were an exact replication of the adolescent use questions found on the PPAAUS. "Parental Use" was designated for those individuals with a score of two or greater on any of the substance items. This would indicate that at some point, if not currently, the parent had used a particular substance.

The Primary Prevention Awareness, Attitude and Usage

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Scale - Form 9 (PPAAUS) was utilized to assess the Behavioral Intention and the Self-Reported Use of Alcohol, Tobacco Products and Illicit Drugs among adolescents (Appendix C) (Swisher, 1989). The scale consisted of 99 questions with ten subscales. The questionnaire included several demographic items (gender, grade, overall grade average) as well as several subscales concerning adolescent's self-reported behaviors and attitudes regarding substance use. The PPAAUS can usually be completed in thirty minutes by students with a sixth grade or higher reading level (Swisher & Hu, 1983). Students completed the entire survey although not all of the subscales were used in the analysis and testing of the hypotheses.

The two scales that were used from the PPAAUS for the data analysis were the Behavioral Intention to Use Substances and the Self-Reported Substance Use scale. Each of these scales contained thirteen substances which generated variables used in the hypothesis testing.

One item on the self-report usage scale was a bogus substance. This item helped to identify those individuals who may have exaggerated their use of substances or those who were careless about their responses. Any student claiming to use this substance within the past year was eliminated from the analysis. In addition, any questionnaire in which the adolescent reported that her parent had used this drug within the past year was eliminated from the data analysis. Three cases were

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eliminated from the study due to reported usage of this substance.

The PPAAUS has demonstrated strong internal reliability that is consistent across different settings as well as high validity for individual items and subscales (Swisher & Bibeau, 1987; Swisher et al., 1984). Internal consistency using coefficient alpha has been reported to be very good for the Behavioral Intention to Use Substances Scale (alpha= .76 to .83) and for the Self-Reported Use Scale (alpha=.83 to .90). Correlation between scales is very good (Pearson product moment correlation coefficient=.90). Face and content validity was reported to be very good (Appendix G).

The Family Adaptability and Cohesion Scale (Faces III) was developed to assess the two major dimensions of the Circumplex Model, i.e., family adaptation and family cohesion (Olson et al., 1985). The FACES III was a 20 item self-report scale containing ten adaptation and ten cohesion items (Appendix D). There were two items for each of the following concepts related to adaptation: leadership, control, discipline; and four items for the combined concepts of roles and rules. There was also two items for each of the five concepts related to cohesion. These are as follows: emotional bonding, supportiveness, family boundaries, time and friends (Olson et al., 1985, p. 20). Family Communication is a third dimension of the Circumplex Model which facilitates movement on the other two dimensions (Olson et al., 1985, p. 3).

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The FACES III was intended to be administered to families across the life span, from couples recently married to those who are retired. The scale is considered readable and understandable to those as young as twelve years old.

The respondent was requested to read the questionnaire statements and decide how frequently the described behavior occurred in their family. The Likert-type scale ranges from 1 (almost never) to 5 (almost always). The cohesion score is the sum of all the odd items, and the adaptability score is the sum of all the even items. Balanced scores were computed by comparing the subject's scores to norms and cutting points for the FACES III (Olson, et al., 1985).

The FACES III has undergone several revisions in an effort to continually increase the instrument's reliability and validity. Appendix G provides a summary of the psychometric properties. In terms of reliability, the internal consistency (Cronbach's Alpha) is very good (Adaptation r=.62; Cohesion r=.77) and test-retest reliability (Adaptation r=.80; Cohesion r=.83) is also very good (Appendix G). In terms of validity, the face and content validity of the scales are very good. The correlation between cohesion and adaptation has been reduced to zero, thus the construct validity is also very good (Olson et al., 1985).

The Parent-Adolescent Communication Scale (PACS) was developed by Barnes and Olson (1985) to measure two aspects of family communication. These two aspects are Open Family

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Communication and Problems in Family Communication. The scale is a 20 item self-report scale containing ten items related to the positive aspects of communication (open communication) and ten items related to negative aspects of communication (problems in family communication). The items are considered to be readable and understandable for a child as young as twelve years of age. The respondent was asked to read the statements on the scale and decide how strongly they agreed or disagreed that these statements reflected communication in their family.

The scale has been developed for use by both the adolescent and his parents. For the purposes of this study only the adolescent forms were used. The subjects were asked to complete one questionnaire about communication with their mothers and one questionnaire about communication with their fathers (Appendixes E and F). If an adolescent was not residing with either a mother or a father, that information was recorded and no scale was completed for that adolescent-parent dyad.

During the scoring procedure, the scale yields separate scores for each of the two subscales, as well as a composite score. A high composite score is considered to represent positive, open levels of family communication with low scores representing more negative and problematic communication patterns in the family (Barnes & Olson, 1985).

Reliability for the PACS was originally established using Cronbach's Alpha. Using a sample of 1,841 subjects,

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the alpha reliability was very good for Open Family Communication (r=.87), for Problems in Family Communication (r=.78) and for the total scale (r=.88). The results indicate that the subscales and the total scale have good internal consistency (Barnes & Olson, 1985). Content and face validity for the scale are very good, and construct validity using factor analysis was also very good (Appendix G) (Barnes & Olson, 1985).

Procedure for Subject Recruitment and Data Collection

To proceed with subject recruitment and data collection several consents and sanctions to conduct this study were obtained. Following approval by the University of San Diego Human Subjects Review Committee, attempts were made over a five month period to recruit a school district to participate in the study (Appendix H). Of the nine school districts contacted, one agreed to allow the research to be conducted.

The participating school was located in an urban Southern California city. Students attending the school represent a wide variety of socioeconomic and ethnic groups. New housing developments built recently within the boundaries of the school district have brought affluent families to an area primarily characterized by middle class, military, and itinerant worker families. The participating school is one of two comprehensive high schools in the school district. Students attending the second high school tend to come from more affluent families than do those

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students attending the school represented in this study.

A minimum sample size of 280 students from the participating school was required to establish a degree of confidence in the interpretation of the results of this study. This criteria was established based upon the recommendations of Burns and Grove (1987) and Waltz and Bausell (1981) who have suggested that when using canonical correlation analysis a minimum sample size of 200, or 25 subjects per variable is advised.

The initial entry into the school district was made through telephone contact with the school nurse. The nurse agreed to read and review the research proposal. Following this review the proposal was submitted by the nurse to the school principal. After the principal reviewed the proposal the investigator met with the principal and the nurse to answer questions they had concerning the project. Following this meeting the nurse and the principal submitted the proposal for approval to the Assistant Superintendent of the district. The investigator met with the Assistant Superintendent, and at the end of this meeting formal approval was given to begin the study immediately (Appendix I).

Arrangements were made by the school nurse and the investigator to meet one of the two teachers whose classes would be used for the recruitment of subjects. It had been previously determined by the school nurse and the principal that all students enrolled in a Health and Safety class

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would be asked to participate in the study. The teachers who taught the Health and Safety classes were instrumental in the success of the data collection process. The teachers allowed the researcher use of class time to discuss and distribute the introductory letters and consent forms on the first day of the week as well as collect the data on the last day of the week. The teachers collected all of the consent forms and they assisted in the distribution of the introductory letters and consent forms to those students who had been absent or to those who lost their original forms. Incentives to participate in the study were provided by the teachers by granting extra class credit to those students who participated in the study.

To meet the minimum sample size criterion subject recruitment and data collection took place twice; once in January at the close of the Fall semester and once in February at the beginning of the Spring semester. The subject recruitment and data collection period took place over a five day period in January and a four day period in February (Monday was a holiday). On the first day of the school week the investigator introduced the study. During the following two to three days consent forms were collected by the teacher and on the last day of the week the questionnaires were completed during class period.

To be considered a potential subject minimal inclusion criteria included: (a) male or female high school student aged 12-19, and (b) parental permission to participate.

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Subjects were excluded from the study if they failed to return the consent form with their signature and the signature of at least one parent or guardian.

On the pre-determined dates the researcher attended each of the Health and Safety classes to distribute the introductory letter and consent forms to the students present in class that day (Appendixes J and K). The researcher was introduced and the purpose of the study was explained. The researcher reviewed the introductory letter to the students as they read along. The introductory letter contained information about the purpose of the study, what was involved, confidentiality and anonymity of participant data, and the risks and benefits associated with participation. The students were asked to take the introductory letter and consent form home and review them with one or both of their parents. If the student wanted to participate they were asked to sign the consent form and have one parent or guardian sign the form. The student was instructed to bring the consent form back within the next three or four days to the teacher in her Health and Safety class.

On the last day of the data collection week the researcher and a research assistant attended each Health and Safety class to administer the data collection instruments. Students who had not previously turned in the consent form were allowed to do so at that time. The nature of the study was again described, including the confidentiality and

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anonymity of their participation and of the research findings. In addition the students were reminded of the importance of answering the questions in a truthful manner.

The teacher read aloud the names of the students who had submitted a signed consent form. These students were given a pencil and the four measures to complete. Completion of these four measures ranged from 20 minutes to 60 minutes. Those students not participating in the study were given an in-class assignment to complete by their teacher. In addition they were asked by the investigator to respond to a single written question regarding why they chose not to participate in the study.

At the conclusion of the testing the adolescent gave the questionnaires back to either the researcher or the research assistant. The questionnaires were briefly reviewed to assure that the student had answered all of the questions. If any missing data was noted the researcher asked the student to complete the missing information. The students were happy to comply with this request. The student was given an opportunity to ask any further questions she may have had at the completion of the data collection. The adolescent was asked not to share any information about the study for one day. The researcher thanked the adolescent for her participation and recorded in the teacher's grade book that the student had participated in order that the student would receive the extra class credit.

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All data was kept in a locked file cabinet. Participant names were not attached to any of the data collection instruments. Data from the study was only accessible to the primary investigator, and no one was able to obtain the results concerning a particular individual who participated in the study.

Upon completion of the data analysis a written report was submitted to the school district. The researcher was also available to present the findings to any interested staff, parent, or student group within the district.

Data Analysis

The data analysis proceeded in several steps, all of which were completed using the Statistical Packages for the Social Sciences computer software system (SPSS-X, 1988). The purpose of the analysis was to statistically address the five hypotheses of the study. To complete this task both descriptive and correlative techniques were utilized.

The first step of the analysis involved the descriptive analysis of the data from the Demographic Survey and the PPAAUS. Frequency distributions and measures of central tendency were used to describe the characteristics of the study population and the extent of their substance usage. Scatter diagrams and stem-and leaf plots were utilized to determine normal distribution and linearity of the data. Pearson product-moment correlations were computed to describe the relationship between the variables which were addressed in the hypotheses.

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Following data description, scoring of the FACES III, the Parent-Adolescent Communication Scale, the Parental Use Scale, the Adolescent Behavioral Intention to Use Scale and the Adolescent Actual Use Scale was completed. Although the FACES III is considered to yield a curvilinear relationship between adaptation and cohesion; Olson, Russell and Sprenkle (1983) have suggested that the curvilinear relationship holds only for problem families. The majority of families in the sample population were assumed to be "normal", that is, without signs of severe levels of dysfunctionality for which individual or group counseling is being pursued. Therefore it was appropriate to utilize adaptation and cohesion as linear relationships in the statistical analysis (D. Olson, personal correspondence, June 1989).

To determine the linear score for the FACES, the formula for calculating the Distance from Center (DFC), that is, the distance of an individual's cohesion and adaptability score from the center of the Circumplex Model, was computed using the following formula:

$$\text{Individual Distance From Center} = \sqrt{(\text{Ind. Cohesion} - 39.8)^2 + (\text{Ind. Adaptation} - 24.1)^2}$$

The lower the DFC score, the closer was the subject and his family to the center of the Circumplex Model, thereby indicating a more balanced level of family functioning (Olson et al., 1985). This computation produced three subject groups: Balanced Families, Midrange Families and Extreme Families.

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The Parent-Adolescent Communication Scale was recoded to create unidirectionality of all responses. A sum score was then computed. A higher score reflects more open and positive communication between the particular parent or guardian and the adolescent.

There were a total of three substance scales, one describing parental use, one describing adolescent behavioral intention and one indicating self-reported use of substances by the adolescent. Each of these scales was comprised of thirteen substances which were combined to form three substance subscales: alcohol, tobacco products and illicit drugs. In addition each scale contained one bogus drug. Cases in which a subject indicated that this substance was used were eliminated from the study.

Scoring of each scale was completed by computing a sum score of all thirteen items on each scale, and by computing scores for each subscale. The Substance Use variable reflected the sum score of all thirteen items. In addition, each subscale was a separate variable in the data analysis. The Alcohol Use variable was a product of four items (beer, wine, coolers, and liquor), the Tobacco Products Use variable was comprised of two items (cigarettes and chewing tobacco or snuff) and the Illicit Drug Use variable was comprised of seven items from the PPAAUS (marijuana, inhalants, cocaine, heroin, hallucinogens, uppers and downers). The score for each scale was the sum of the responses of each subject. A high score on any scale

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indicated more frequent use of the substances which comprised each scale.

Canonical Correlation

With the preceding information computed and summarized, data analysis proceeded to address each of the five hypotheses. Hypothesis One explored the relationship between two sets of variables. The set of independent or predictor variables included Family Adaptation and Cohesion, Adolescent-Father Communication, Adolescent-Mother Communication, Parental Use of Alcohol, Parental Use of Tobacco Products, Parental Use of Illicit Drugs, Age and Gender. The set of dependent or criterion variables was comprised of Adolescent Behavioral Intention to Use Alcohol, Behavioral Intention to Use Tobacco Products, Behavioral Intention to Use Illicit Drugs, Adolescent Reported Use of Alcohol, Reported Use of Tobacco Products and Reported Use of Illicit Drugs.

To test the first hypothesis canonical correlation was utilized as the statistical method of choice. As an extension of multiple regression, canonical correlation is designed to statistically examine the relations between sets of independent variables and sets of dependent variables (Burns & Grove, 1987; Cohen & Cohen, 1983: Kerlinger, 1986; Levine, 1977; Thompson, 1984; Waltz & Bausell, 1981; Woods & Catanzaro, 1988).

It should be noted that canonical correlation does not inherently emphasize any one set of variables. The goal of

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the analysis is not to predict or explain one variable set from another. Although the terms "predictor" and "criterion" are used in reference to the variable sets, mathematically the canonical analysis is symmetric in its mathematical treatment of the two variable sets. Therefore the designation of a set of variables as the "predictor" or "criterion" set is arbitrary, and does not indicate directionality (Thompson, 1984, p. 58).

A canonical correlation analysis between two sets of variables yields one or more linear combinations, each composed of two canonical variates. Each variate has a set of weights which indicates the relation, or relative importance, of each variable to the formation of the variate (Munro, 1986). The relationship between each variate is expressed as the canonical correlation coefficient, R_c (Pedhazur, 1982; Thompson, 1984). R_c is the maximum correlation between the linear composites from each data set. R_c^2, the square of the canonical correlation, is an estimate of the variance shared by the linear combinations, that is, by the variates (Pedhazur, 1982). As a rule of thumb, Pedhazur (1982) has suggested that only R_c^2s greater than or equal to .10 be treated as meaningful.

Many researchers use the standardized canonical weight, symbolized as "B", as the measure of a variable's significance and contribution to the linear equation. Pedhazur (1982) warns that these canonical weights suffer from the same shortcomings as do those of the standardized

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regression coefficients used in multiple regression. These weights may be unstable due to multicollinearity whereby some variables may obtain only a small weight because the variance has already been explained by other variables. In this situation the standardized weights may not give a clear picture of the relevance of each variable (Kuylen & Verhallen, 1981; Thompson, 1984).

The use of structure coefficients has been suggested as both an alternative and supplement to data interpretation (Pedhazur, 1982; Thompson, 1984). A structure coefficient, symbolized as "s", is the correlation between the original variable and the canonical variate (Pedhazur, 1982). The squared canonical structure coefficient represents the proportion of variance linearly shared by a variable with the variable's canonical variate composite (Harford & Grant, 1987, p. 552). In the data analysis for the current study, both standardized coefficients and structure coefficients will be presented. For the purpose of interpretation, structural coefficients will be utilized, with a coefficient greater than or equal to .30 treated as meaningful (Pedhazur, 1982).

The first set of linear combinations represents the variate pairs with the highest R_c or structure coefficients. Having isolated the first pair of linear combinations, computer analysis proceeds to identify the linear combinations which have the second highest correlation and thereby account for the second largest amount of variance.

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This procedure is repeated until there are no significant R_cs or structure coefficients left (Munro, 1986; Pedhazur, 1982). As a result, more than one correlation coefficient may be formed from a single analysis. Each succeeding pair of variates is considered unique and is not correlated with any of the variate pairs which preceded it (Pedhazur, 1982). The maximum number of variates that can be formed in an analysis is equal to the number of variables in the smaller variable set (Pedhazur, 1982). It should be noted that not all of the coefficients will be statistically significant, and therefore meaningful in the interpretation of the data.

The interpretation of the data is five-fold. To begin, the multivariate test of significance must be analyzed to determine if the null hypothesis, that there is no relationship between the criterion and predictor variable sets, can be rejected (Thompson, 1984). Canonical correlations which fail these tests of significance are not considered reliable and should not be interpreted (Tabachnick & Fidell, 1983). For the current study Pillai's Trace, Hotelling's Trace and Wilks' Lambda tests of significance were used to confirm that the predictor set had a statistically significant impact on the criterion set.

The second step of data interpretation involves determining the number of variate sets which should be considered significant and meaningful, and determining how much of the variance is accounted for by these statistically significant variates. An examination of the eigenvalues and

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canonical correlations by root determines which root(s) have more of the variance associated with them. A dimension reduction analysis provides a test of significance for each root using Wilks' Lambda and its associated degrees of freedom. The overall lambda tests the null hypothesis that all R_c^2s are equal to zero. If the null hypothesis is rejected, at least the first R_c^2 is statistically significant (Pedhazur, 1982, p. 739). Lambda is then calculated on all pairs of variates with the square of the first canonical correlation removed from the equation. If lambda reaches significance then the first two R_c^2s are statistically significant. Lambda proceeds to be computed on all variates with the first two pairs removed. If significance is reached the first three pairs of variates would be considered significant. This procedure continues in a similar fashion until lambda is found not to be statistically significant. The R_c^2s preceding this step are thus determined to be statistically significant and are retained for the data interpretation (Pedhazur, 1982; Tabachnick & Fidell, 1983).

In conjunction with establishing significance, meaningful correlations must be identified. An R_c^2 indicates the amount of variance shared by the canonical variates. Squared canonical correlation coefficients of greater than or equal to .10 would be treated as meaningful, and would indicate that the corresponding pair of linear combinations should be retained in the data analysis

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(Harford & Grant, 1987; Pedhazur, 1982).

Once significant and meaningful variates have been identified, the variables contributing to the linear combinations can be determined through analysis of standardized weights and structure coefficients.

At this point several variance relationships can be examined. The amount of variance that is accounted for by each canonical variate (the sum of the squared canonical structural coefficients) can be determined (Pedhazur, 1982). In addition, the proportion of total variance extracted by the canonical variates of a given variable set (PV) can be examined. This variance is computed by summing the squared structure coefficients for a given root, dividing this sum by the number of variables in the set, and multiplying by 100 (Pedhazur, 1982; Tabachnick & Fidell, 1983).

Finally, redundancy indices can be computed. Redundancies yield information about the proportion of variance in the predictor set that is redundant with or predicted by each linear combination of the criterion variables, and in a like manner for the criterion variable set (Pedhazur, 1982). In the current study, redundancies were calculated for both sets of variables, the criterion variable set and the predictor variable set. Pedhazur (1982) suggests that in some studies, this would not be appropriate:

> (W)hen in a given study the X's are treated as predictors and the Y's are treated as criteria, it is

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> meaningful to calculate redundancies only for the Y's because the interest is in determining the proportion of variance of the criteria that is predictable from the predictors--not vice versa (p. 738).

This study did not intend to emphasize one set of variables as predictive of another set, therefore redundancies were computed for both independent and dependent variable sets.

Redundancy for each variable set is computed using the formula $Rd = (PV)(R_c^2)$. The redundancy of a canonical variate is the percent of variance it extracts from its own set of variables, times the squared canonical correlation for a particular linear combination (Tabachnick & Fidell, 1983, p. 157). Total redundancy ($\overline{Rd}$) can be computed for each variable set and equals the sum of all possible redundancies for that variable set (Thompson, 1984). The total redundancy of the predictor variables is the total predictable variance of the independent variables from all linear combinations of the dependent variables. Similarly, the total redundancy for the criterion variables represents the total predictable variance of the dependent variables from all linear combinations of the independent variables. The redundancy index is not a measure of multivariate analysis nor is it an analytic tool; however, it is considered a useful method to assist the researcher in a more precise examination and interpretation of the canonical correlation analysis outcomes (Pedhazur, 1982; Thompson, 1984).

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Inferential Statistics

Hypotheses Two, Three, Four and Five were tested using inferential statistics generated by one-way analyses of variance (ANOVA) and T-tests. An alpha level of 0.05 was specified as the desired level of significance for all hypothesis testing.

Hypothesis Two addressed the influence that levels of family functioning had upon adolescent use of substances. The hypothesis tested is H_1: $u_B < u_N$, where u_B equals the mean score for adolescent substance use in balanced families and u_N equals the mean score for adolescent substance use in the non-balanced family groups. To test this hypothesis, balanced versus not balanced families were examined in two ways. T-tests examined the differences between two subject groups: Balanced Families (N=102) and Non-Balanced Families (N=204). The non-balanced group was comprised of subjects who fell into the midrange or extreme category of the DFC cutting points. ANOVA examined the differences among three family groups: Balanced Families (N=102), Midrange Families (N=103) and Extreme Families (N=101).

Hypothesis Three examined group means on the dependent variable of Adolescent Substance Use by the independent variable of Age. This directional hypothesis was summarized as H_1: $u_o > u_y$, where u_o equals the mean score for older adolescents and u_y equals the mean score for younger adolescents. The two groups used in this analysis were younger adolescents aged 12 to 15 and older adolescents aged

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16 to 19. The study population was very homogenous with respect to age, and therefore the two groups were in actuality adolescents aged 14 to 15 (N=148) and adolescents aged 16 to 18 (N=161).

Hypothesis Four tested the null hypothesis that there were no differences between the group means of Adolescent Reported Use of Substances by Gender. This hypothesis was represented as H_0: $u_m = u_f$, where u_m equals the mean use of substances for males and u_f equals the mean substance use for females. The two groups consisted of 151 male subjects and 155 female subjects.

Hypothesis Five tested the one-sided alternative hypothesis that Adolescent Reported Use of Substances was a function of Parental Substance Use. This hypothesis can be summarized as H_1: $u_1 > u_2$, where u_1 is the mean among students whose parents use substances and u_2 is the mean among students whose parents do not use substances. Two parental groups were analyzed. The first group consisted of those parents who did not nor had ever used any type of substances as reported by the adolescent. The second group consisted of those parents who had used substances of some type at some point in their life time as reported by the adolescent. This hypothesis was analyzed using both cumulative parental and adolescent substance scales and by using the parental alcohol, tobacco products and illicit drugs subscales as they correlated with the adolescent actual use of alcohol, tobacco products and illicit drugs

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subscales.

Assumptions

The primary theoretical assumption of this study was that adolescents, as integral members of the family system, have valid and reliable perceptions about their family functioning. These perceptions are of great importance and value as researchers and theorists attempt to determine the relationships among family members and predict the impact of these relationships on the behavior of family members. The fact that 66% of the population willingly participated in the study indicates that adolescents have a desire to share their thoughts and feelings about issues that are critical to their development. In addition, the large number of adolescent participants reflects parental willingness to allow their child to freely express their thoughts concerning health and family related issues.

The statistical assumptions of the study included those that are appropriate for the use of canonical correlation, ANOVA and T-tests.

ANOVA and T-test assumptions include independent and random comparison groups, interval level dependent variable data, normal distribution and homogeneity of variances (Kirk, 1982; Shavelson, 1981). The first assumption was partially met. The subjects in each group were unrelated and therefore their scores were independent of each other. The study sample was a random sample in that the school which the student attended was randomly selected to ask to

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participate in the study. Participating students were drawn from a convenience sample of students attending a required Health and Safety class. Interval level data was present in all variables. Normal distribution and homogeneity of variance were assessed using descriptive and correlational analysis. Descriptive statistics for the main variables are presented in Table 2. Not all variables demonstrated a normal distribution of scores. However, it should be noted that ANOVA and T-tests are not sensitive to violations of the assumptions of normality and homogeneity of variance when the sample sizes in each comparative group is the same (Shavelson, 1981).

The assumptions for canonical correlation are those similar to other forms of multivariate analysis. These assumptions include randomization, normality, linearity, collinearity and singularity, the use of interval, continuous variables and the use of reliable instruments (Burns & Grove, 1987; McLaughlin & Otto, 1981; Tabachnick & Fidell, 1983; Thompson, 1984). The school participating in the study was randomly selected. Subjects were selected to ask for their participation based upon their attendance in a required class. Normality of distribution was assessed utilizing plots and descriptive statistics, and this assumption was demonstrated to have been partially met.

Similarly, the assumption of linearity was partially met. Examination of scatterplots and histograms indicated some deviation from normality and linearity, most notably

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Table 2

Descriptive Statistics for All Variables

Name of Variable	N of Valid Cases	Mean	Standard Deviation	Minimum	Maximum
FACES	306	10.69	6.13	1	30
Balanced Faces	306	2.00	.82	1	3
Father-Adolescent Communication	285	66.39	16.59	25	100
Mother-Adolescent Communication	305	71.68	15.44	30	100
Parental Use of Alcohol	306	10.55	4.26	4	24
Parental Use of Tobacco Products	306	4.00	2.25	1	12
Parental Use of Illicit Drugs	306	7.48	1.44	6	19
Parental Use of Substances	306	22.02	5.92	13	45
Adolescent Behavioral Intention to Use Alcohol	306	10.39	4.81	4	20
Adolescent Behavioral Intention to Use Tobacco Products	306	3.19	1.63	2	10
Adolescent Behavioral Intention to Use Illicit Drugs	306	8.49	3.07	7	25
Adolescent Behavioral Intention to Use Substances	306	22.07	7.81	13	55
Adolescent Self-Reported Use of Alcohol	306	8.81	4.04	3	22
Adolescent Self-Reported Use of Tobacco Products	306	3.28	1.85	1	12
Adolescent Self-Reported Use of Illicit Drugs	306	7.61	1.44	7	15
Adolescent Self-Reported Use of Substances	306	19.70	6.14	13	43
Age	306	15.68	.78	14	18
Gender	306	.51	.50	0	1

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with respect to the parent-adolescent communication scale. Tabachnick and Fidell (1983) have stated that there is no requirement that the variables be normally distributed when canonical correlation is used descriptively. Collinearity and singularity among dependent variables were established by Bartlett's test of sphericity ($p \leq .000$), thus rejecting the null hypothesis that the population correlation matrix was an identity matrix (Norusis, 1988). All variables were continuous. To obtain continuous variable sets gender was transformed to a dummy variable, a procedure recommended by Darlington, Weinberg and Walberg (1973). Reliability of the instruments was established prior to data collection. Mean inter-item and corrected inter-total item correlations and reliability estimations for all scales in this study are presented in Table 3.

Although all of the statistical assumptions were not fully met, it should be noted that canonical correlation is considered to be very robust with regard to violations of these assumptions (McLaughlin & Otto, 1981; Thompson, 1984).

Limitations

A limitation of any self-report study is that the subjects may not be truthful in their responses. One item on the usage scale of the PPAAUS was a bogus drug. If a student indicated usage of this substance within the past year, his data was not included in the analysis. Three subjects were eliminated from the analysis for this reason. Although this did not control for a subject understating his

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use of substances, this item did help monitor the student who was exaggerating or not paying close attention to his responses. To minimize this limitation of the study the subject was assured that his responses were confidential and that no person would know exactly how he responded to any of the questions.

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Table 3

Mean Inter-Item and Item-Total Correlations and Reliability Estimations for All Scales

Name of Scale[a]		N of Cases	Mean Inter-Item Correlation	Corrected Item-Total Correlation Range	Standardized Alpha (Cronbach's)
FACES					
Family Adaptation	(10)	306	.13	.11 to .38	.61
Family Cohesion	(10)	306	.35	.37 to .75	.84
Father-Adolescent Communication	(20)	285	.32	.13 to .76	.91
Mother-Adolescent Communication	(20)	305	.30	.14 to .73	.90
Parental Use of Alcohol	(4)	301	.48	.55 to .64	.79
Parental Use of Tobacco Products	(2)	302	.06	.06 to .06	.12
Parental Use of Illicit Drugs	(7)	304	.23	.14 to .52	.67
Parental Use of Substances	(13)	295	.15	.07 to .60	.70
Adolescent Behavioral Intention to Use Alcohol	(4)	303	.65	.70 to .79	.88
Adolescent Behavioral Intention to Use Tobacco Products	(2)	306	.15	.15 to .15	.26
Adolescent Behavioral Intention to Use Illicit Drugs	(7)	306	.47	.52 to .73	.86
Adolescent Behavioral Intention to Use Substances	(13)	303	.35	.24 to .71	.88
Adolescent Self-Reported Use of Alcohol	(4)	299	.62	.66 to .77	.87
Adolescent Self-Reported Use of Tobacco Products	(2)	305	.24	.24 to .24	.38
Adolescent Self-Reported Use of Illicit Drugs	(7)	306	.16	.07 to .40	.56
Adolescent Self-Reported Use of Substances	(13)	298	.22	.07 to .77	.78

[a]Number of items on scale in parentheses.

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Chapter Four

Results

Introduction

The fourth chapter presents the results of the data analysis. The chapter begins with a presentation of descriptive information concerning the characteristics of the sample and the variables of parental substance use, adolescent behavioral intention to use substances and adolescent self-reported use of substances. Following this the results of the hypothesis testing will be presented. When appropriate, post hoc analyses are discussed within the context of the related hypothesis. A summary of the results concludes the chapter.

Subjects

The sample for this study consisted of 306 male and female students from a high school in a K-12 unified school district in Southern California. Data was collected during Health and Safety classes that are a required course for the 464 tenth grade students attending the school. On the data collection days 395 students were present; thus 78% of the potential population present on those days participated in the study. Table 4 summarizes the characteristics of the subjects.

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Table 4

Characteristics of the Sample

N = 306 Males = 151 (49.3%) Females = 155 (50.7%)

Age
- 14 ..... 2 (0.7%)
- 15 ..... 144 (47.7%)
- 16 ..... 124 (40.5%)
- 17 ..... 26 (8.5%)
- 18 ..... 10 (3.3%)

Grade Level
- Ninth Grade 2 (0.7%)
- Tenth Grade 273 (89.2%)
- Eleventh Grade 14 (4.6%)
- Twelfth Grade 17 (5.6%)

Ethnicity
- Caucasian 173 (56.5%)
- Hispanic 48 (15.7%)
- Asian 40 (13.1%)
- Black 15 (4.9%)
- Other 30 (9.8%)

Live With Family In
- Owned Apartment..... 1 (0.3%)
- Rented Apartment 84 (27.5%)
- Owned Condominium .. 21 (6.9%)
- Rented Condominium .. 14 (4.6%)
- Owned Home 146 (47.7%)
- Rented Home 25 (8.2%)
- None of the Above 12 (3.9%)

Household Size
- Two 28 (9.2%)
- Three 58 (19.0%)
- Four 97 (31.7%)
- Five 76 (24.8%)
- Six 26 (8.5%)
- Seven 10 (3.3%)
- Eight 3 (1.0%)
- Nine or greater 4 (1.3%)

Parents' Marital Status
- Married to Each Other 146 (47.7%)
- Divorced, Not Remarried 46 (15.0%)
- Divorced, Mother Remarried . 32 (10.5%)
- Divorced, Father Remarried ... 31 (10.1%)
- Divorced, Both Remarried 17 (5.6%)
- Separated 15 (4.9%)
- Never Married 3 (1.0%)
- Father Deceased, Mother Not Remarried 15 (4.9%)
- Mother Deceased, Father Not Remarried 1 (0.3%)

Adult the Adolescent Lives With
- Both Father and Mother 151 (49.3%)
- Mother 73 (23.9%)
- Father 14 (4.6%)
- Mother and Stepfather 40 (13.1%)
- Father and Stepmother 13 (4.2%)
- Mother and Boyfriend 8 (2.6%)
- Guardians 6 (2.0%)

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The majority of subjects (89.2%) were tenth graders; the remaining subjects were from the twelfth (5.6%), eleventh (4.6%) and ninth (0.7%) grades. There were 155 (50.7%) females who participated in the study, and 151 (49.3%) males who participated. The students ranged in age from 14 to 18. To test the third hypothesis subjects were clustered into two age groups. A total of 146 subjects were 12 to 15 years old (47.7%); 160 subjects were 16 to 19 years old (52.3%). Most of the adolescents were fifteen or sixteen years old (87.5%). Students in the study population represented a variety of ethnic groups including Caucasian (56.5%), Hispanic (15.7%), Asian (13.1%), Black (4.9%), Filipino (3.6%), American Indian (2.6%) and 3.6% were other ethnic groups.

The adolescents came from a variety of family constellations of varying sizes. Approximately half (49.3%) of the subjects came from homes in which they lived with their birth mother and father. Of the remaining population, 23.9% lived with their mother, 4.6% lived with their father, 13.1% lived with their mother and a stepfather, 4.2% lived with a father and a stepmother, 2.6% lived with their mother and her boyfriend and 2.0% lived with adults other than one or both of their parents. Fifteen subjects reported that their father was deceased and their mother had not remarried. Only one adolescent reported living with just his father because his mother was deceased. Eight students, each living with their mother, could not provide information

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about their father or a significant male figure due to lack of contact with these individuals. Family size ranged from two to ten or more, with the most common family size ranging from 3 to 5 (75.5%).

Data was elicited about the type of home in which subjects lived and parental employment status. Over half (54.9%) of the subjects lived in homes, condominiums or apartment buildings that their parents owned. Remaining students lived with their families in rented apartments (27.5%), rented homes (8.2%), rented condominiums (4.6%) or in military housing (3.9%). A majority of fathers (85.3%) and mothers (78.1%) were employed outside the home. Parental occupations were primarily described by the adolescent as being those which required specific skills gained through higher education or through trade schools. Few parents worked in positions which would be considered semiskilled, unskilled or menial labor (11.5% fathers and 14.0% mothers).

Additional data revealed that subjects kept very busy in their after school hours. On an average of once a week or more, 56.9% attended entertainment and social activities with their family or friends, 85.3% spent time pursuing academic activities outside of the classroom, 79.7% were involved in sports activities, 35.0% attended religious services or meetings, and 55.9% worked for pay outside the home.

Students who did not participate in the study were

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asked to respond to one written question concerning the rationale for their decision not to participate. Eighty-two students answered the question. Of these respondents 23% (N=32) stated that they or their parents did not want them to be involved in the study, 39% (N=32) forgot to bring the consent form back to class, 13% (N=11) lost their consent form, three students did not receive consent forms and one student could not get her parents' permission because they were out of town.

Parental Use of Substances

The adolescent was asked to complete a questionnaire which indicated the frequency of substance use by parents. The students responses ranged from "never" to "about once a day". Figures 3a through 3z present and compare the findings of the parental substance use, adolescent behavioral intention to use substances and the adolescent self-reported use of substances questionnaires.

Beer and wine were the alcohol products that adolescents reported most frequently having seen their parents use. Beer (40.2%) and wine (29.7%) were consumed more than once a month by parents. Wine coolers (17.7%) and hard liquor (16.1%) were used more than once a month by fewer parents.

Cigarette use was more common across parental and adolescent use scales than use of other tobacco products such as chewing tobacco or snuff. Adolescents estimated that 25.8% of their parents used cigarettes every day, with

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40.5% having never used cigarettes. In comparison, 90.5% of all parents were reported to have never used other tobacco products.

Adolescents did not report illicit drug use to be common among their parents. Marijuana (85.0%), inhalants (99.3%), cocaine (96.4%), heroin (98.4%), hallucinogens (96.7%), uppers (96.1%), and downers (97.4%) had never been used, or were thought to have never been used by the parents of the subjects.

Adolescent Behavioral Intention to Use Substances

The Behavioral Intention to Use Substances Scale focused upon the adolescent's willingness to try or willingness to use any of the thirteen substances listed. These were not questions about actual use, but rather how one felt about using them. Figures 3a through 3z present these findings in relation to actual parental and adolescent use. The responses on this scale were slightly different than for the other two scales. A "0" indicates the subject would never use the substance or did not know what it was. A "1" indicates the student probably would not use it, a "2" means he was not sure whether or not he would try it, a "3" indicates the student would like to try or use it and a "4" implies that the subject would use the substance any chance they got or they are using it now.

Wine coolers (41.5%) were the alcoholic substance that adolescents most often stated they would like to try or were currently using. Beer was the second most popular product,

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Figure 3. Bar Graphs Illustrating Parental Substance Use, Adolescent Behavioral Intention and Self-Reported Substance Use.

Figure 3a.

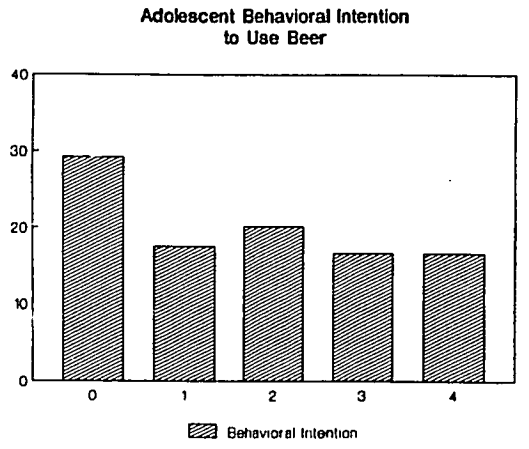


Figure 3b.

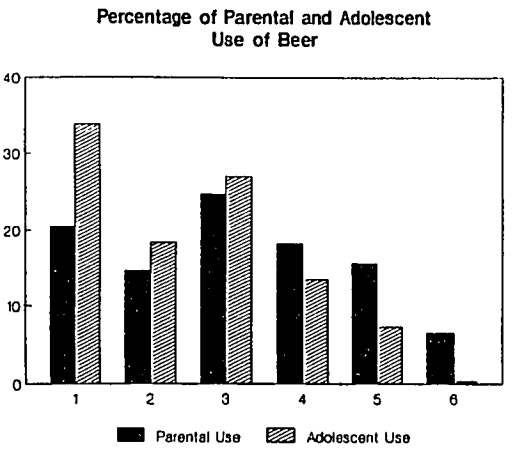


Figure 3c.

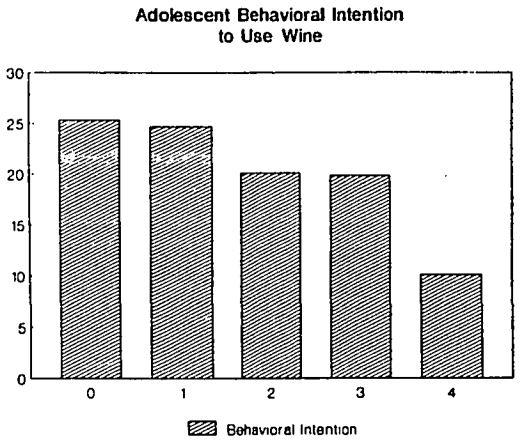
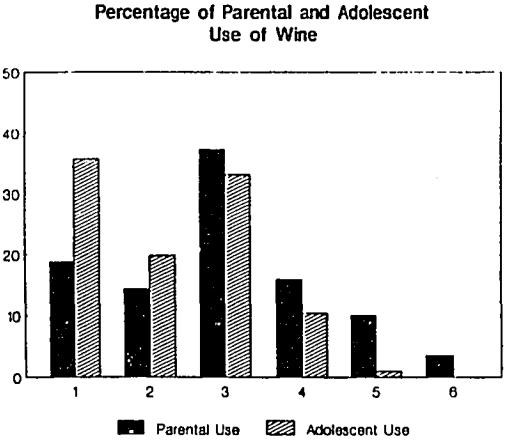


Figure 3d.



NOTE: Adolescent Behavioral Intention
0 - Never
1 - Probably Not
2 - Not sure
3 - Like to try
4 - Use now

NOTE: Parent and Adolescent Substance Use
1 - Never
2 - More than one year ago
3 - Few times a year
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Figure 3. Bar Graphs Illustrating Parental Substance Use, Adolescent Behavioral Intention and Self-Reported Substance Use (continued).

Figure 3e.

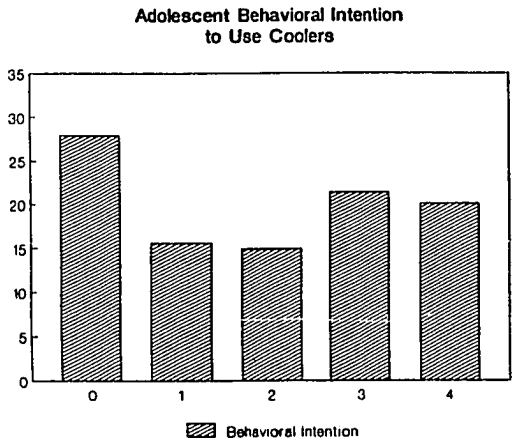

Figure 3f.

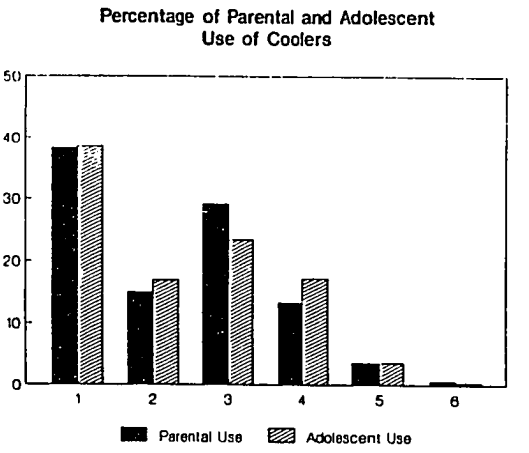

Figure 3g.

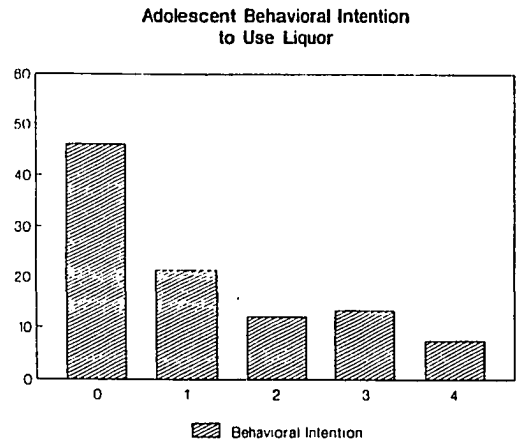

Figure 3h.

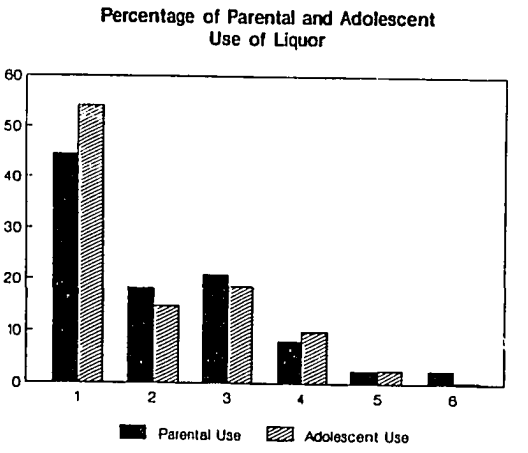

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Figure 3. Bar Graphs Illustrating Parental Substance Use, Adolescent Behavioral Intention and Self-Reported Substance Use (continued).

Figure 3i.

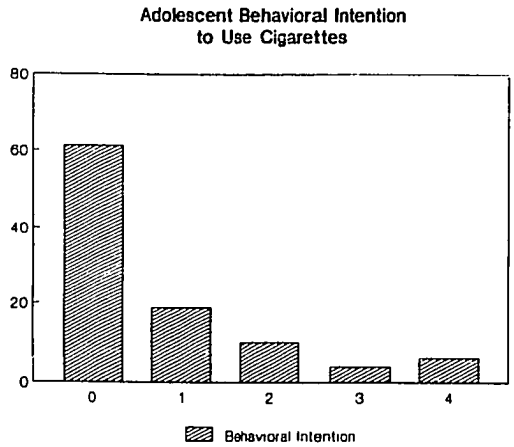

Figure 3j.

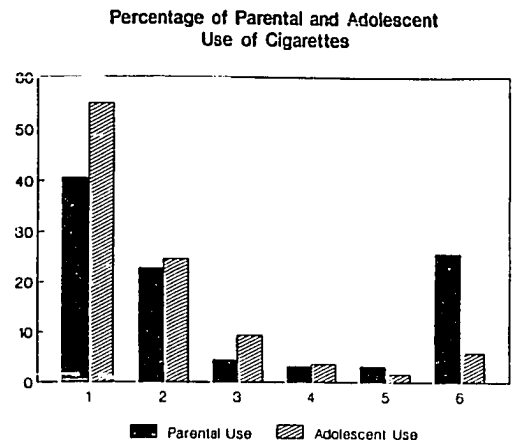

Figure 3k.

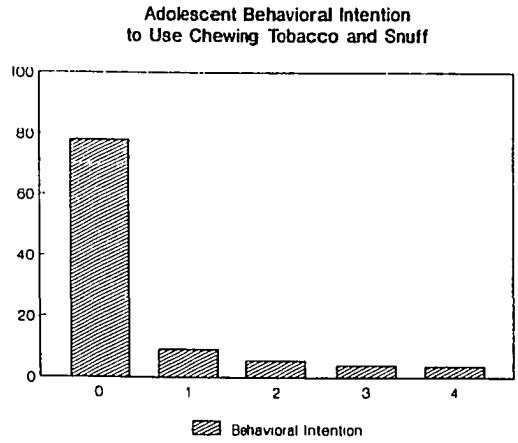

Figure 3l.

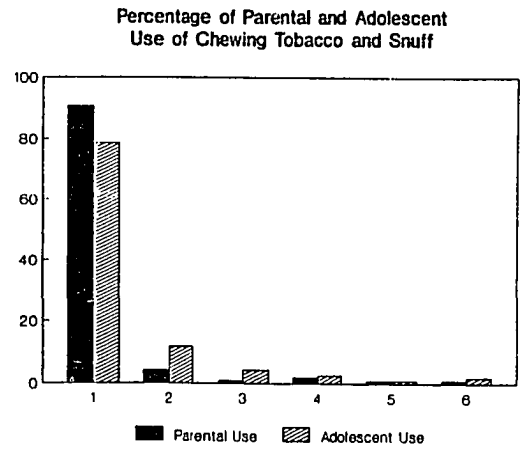

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Figure 3. Bar Graphs Illustrating Parental Substance Use, Adolescent Behavioral Intention and Self-Reported Substance Use (continued).

Figure 3m.

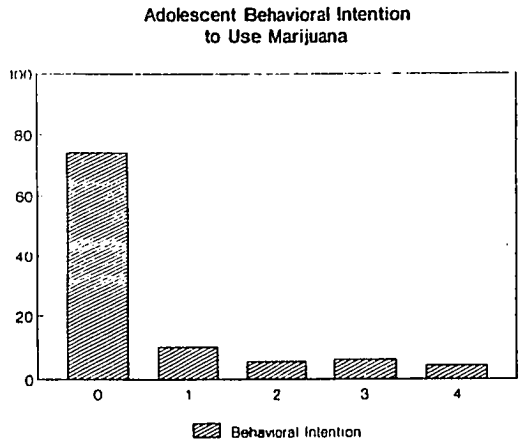

Figure 3n.

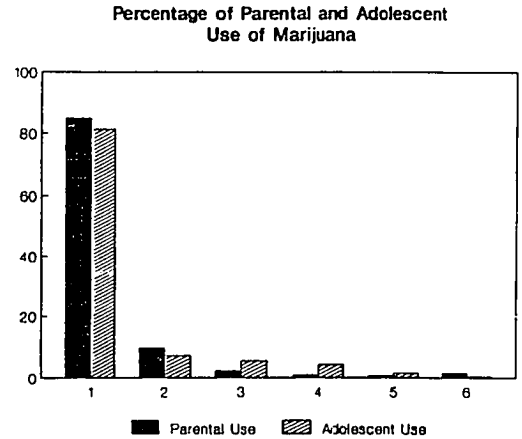

Figure 3o.

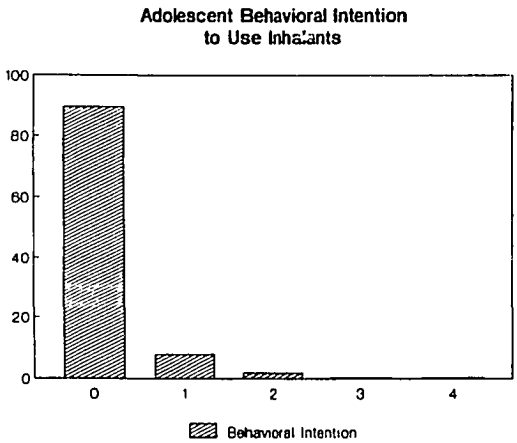

Figure 3p.

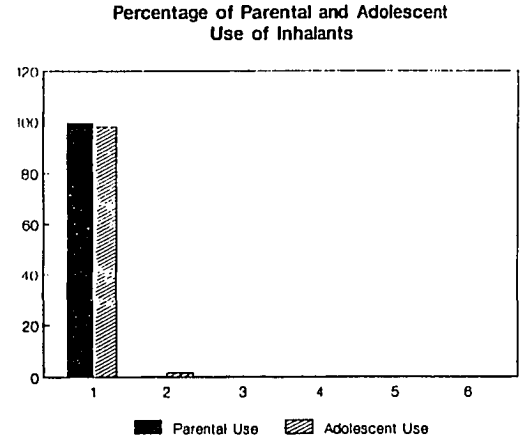

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Figure 3. Bar Graphs Illustrating Parental Substance Use, Adolescent Behavioral Intention and Self-Reported Substance Use (continued).

Figure 3q.

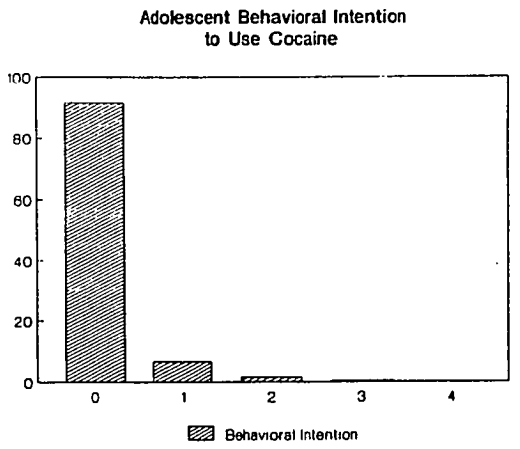

Figure 3r.

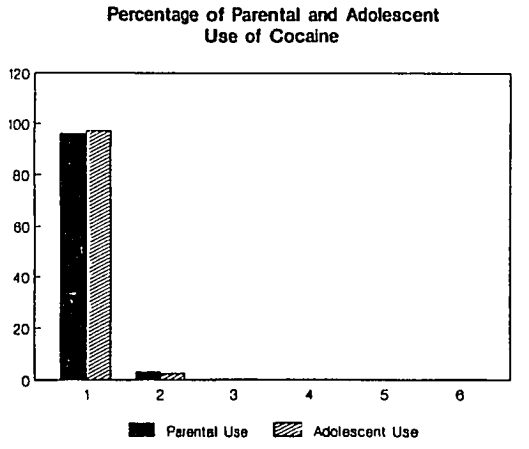

Figure 3s.

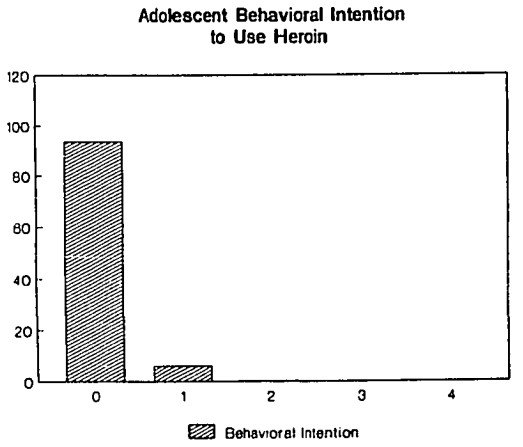

Figure 3t.

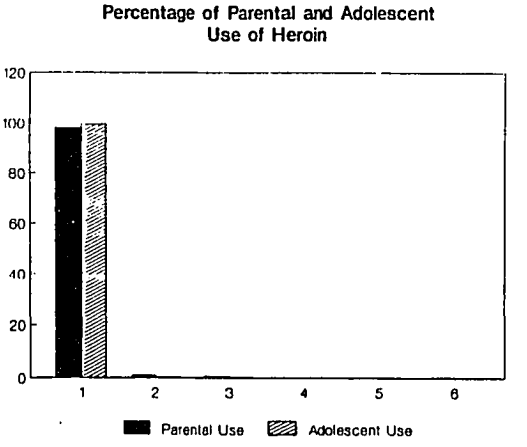

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Figure 3. Bar Graphs Illustrating Parental Substance Use, Adolescent Behavioral Intention and Self-Reported Substance Use (continued).

Figure 3u.

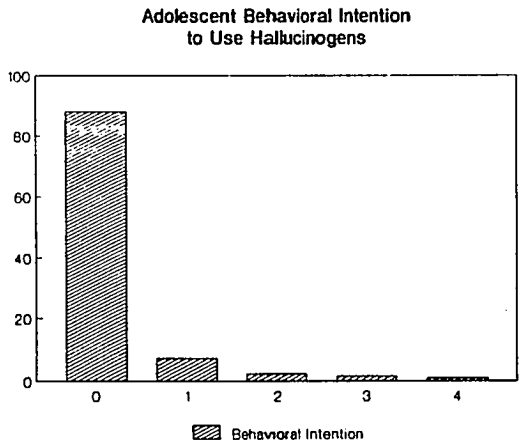

Figure 3v.

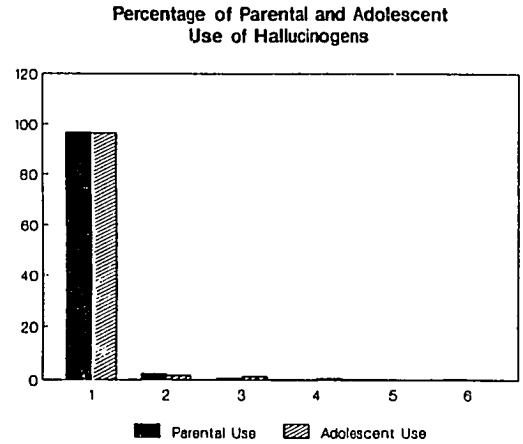

Figure 3w.

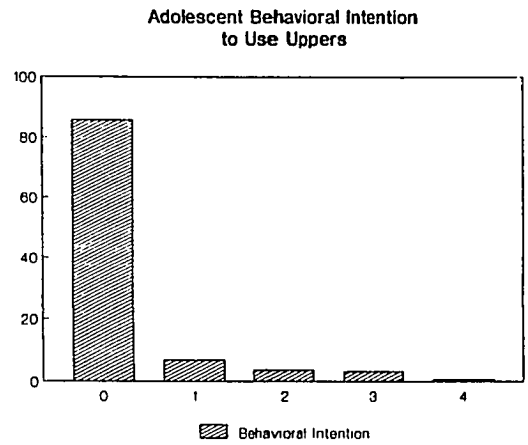

Figure 3x.

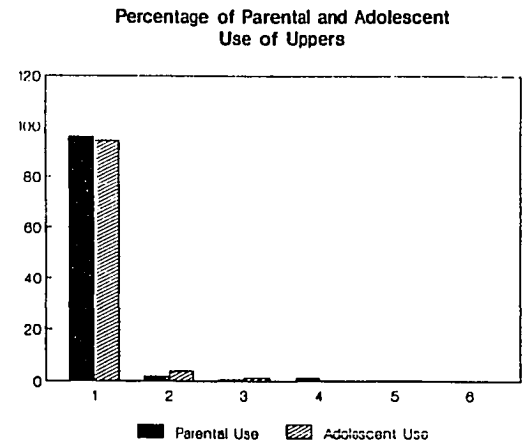

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Figure 3. Bar Graphs Illustrating Parental Substance Use, Adolescent Behavioral Intention and Self-Reported Substance Use (continued).

Figure 3y.

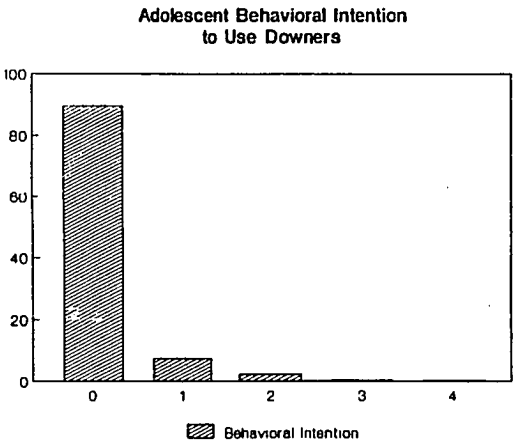

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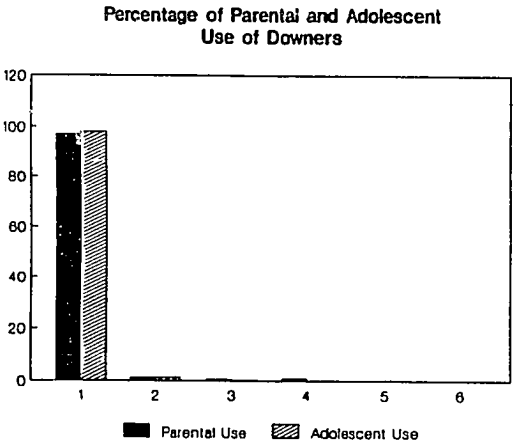
Figure 3z.



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33.0% stating they would like to try or are currently using this product. Only 29.1% stating they have never used beer. Some adolescents stated that they would try or currently use wine (29.4%) and hard liquors (20.6%).

Over three quarters of the adolescents stated that they have never, or would probably never use any of the tobacco products (80.1% cigarettes; 87.6% other tobacco products). Few stated that they would actually like to try or currently use cigarettes (9.8%) or chewing tobacco and snuff (6.9%).

The intention to use drugs was not highly indicated by the adolescents in this study. Marijuana (84.3%), inhalants (97.4%), cocaine (98.0%), heroin (99.7%), hallucinogens (95.1%), uppers (92.5%) and downers (97.1%) are substances adolescents indicated they would probably not, or never would try.

Adolescent Self-Reported Use of Substances

The Adolescent Self-Reported Use Scale evaluated the thirteen substances with respect to the frequency of use by subjects. Wine coolers (20.9%) and beer (20.6%) were alcoholic beverages used by adolescents at least once a month or more often. Liquor (12.4%) and wine (11.2%) were less likely to be used, with liquor representing the beverage which most students had never tried (53.9%).

Although many of the adolescents stated that they would not use or have not used any of the tobacco products, it was apparent from the frequency distributions that a great deal of variability existed between the number of students who

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stated that they do not use cigarettes (55.60%) and those that said they do not use chewing tobacco or snuff (78.7%). Because the Tobacco Products Use Scale consisted of only two items, this large variance may have skewed the overall curve of the tobacco use scale when used for hypothesis testing, giving the impression that tobacco use was not very prevalent. Therefore, after evaluating each hypothesis using Tobacco Products Use as a composite score of two items, each hypothesis was tested with Cigarette Use as a single item scale. Hypotheses Two, Three, Four and Five were examined using this single item scale.

Self-reported use of illicit drugs was not prevalent. The majority of adolescents had never tried marijuana (81.4%), inhalants (98.4%), cocaine (97.4%), heroin (99.7%), hallucinogens (96.7%), uppers (94.4%) or downers (98.4%). Comparing these results to the Behavioral Intention to Use Scale indicates that very few students who are not already using these substances, intend to try them in the future.

Each of the substance scales contained a bogus substance called serotonin. Only three subjects indicated that their parents, or they themselves, have used this fictitious drug. These subjects were withdrawn from the data analysis.

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Hypothesis One: Testing the Canonical Relationships

Hypothesis One stated that adolescent behavioral intention and self-reported use of alcohol, tobacco products and illicit drugs is a function of family adaptation and cohesion, adolescent-father communication, adolescent-mother communication, parental use of alcohol, tobacco products and illicit drugs, age and gender. This hypothesis is stated in such a way as to indicate a relationship between two sets of variables without intending to establish the degree or directionality of that relationship (Darlington, et al., 1973). To test the stated relationships between the sets of variables, Hotelling's canonical variate analysis, or, canonical correlation, was employed as the statistical technique of choice.

Two approaches were selected to test the variable sets delineated in the hypothesis. Each approach was a separate canonical correlation model which was distinctive in the manner in which the study variables were combined and classified to form the predictor and criterion variable sets. The results of both canonical models will be presented.

Canonical Correlation: Model One

The first canonical model was analyzed using variables representing a simplified version of the study design. The predictor variables were Family Adaptation and Cohesion (FACES), Father-Adolescent Communication, Mother-Adolescent Communication, Parental Substance Use, Adolescent Gender and

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Age. The criterion variables were Adolescent Behavioral Intention to Use Substances and Adolescent Self-Reported Use of Substances. A maximum of two canonical variate pairs could be formed in this procedure given that there were only two variables in the criterion set. Multivariate tests of significance (Pillai's Trace, Hotelling's Trace and Wilks' Lambda) supported rejection of the null hypothesis that the predictor variable set was unrelated to the criterion variable set ($p<.000$).

Dimension Reduction Analysis using Wilks' Lambda (Appendix L) revealed both variate sets reached levels of significance (Root 1 $p<.000$; Root 2 $p<.05$). However, the squared correlation coefficient for the second pair of linear combinations was less than .10, and therefore the second canonical variate set was eliminated from further analysis (Appendix M).

The first pair of linear combinations was correlated at .429, with increased Adolescent Behavioral Intention to Use Substances and increased Self-Reported Use of Substances largely a function of non-balanced Family Adaptation and Cohesion, decreased Adolescent-Father Communication, decreased Adolescent-Mother Communication, and increased Parental Substance Use (Table 5 and Appendix N). The heavier weighing of the Parental Use variable would suggest that this variable had a stronger influence upon the criterion variables than did the other predictor variables. The negative prefix on both Father and Mother-Adolescent

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Table 5

Summary of Model One Canonical Correlation

Predictor variables	β	s	Criterion variables	β	s
Family Adaptation and Cohesion	.307	.476	Intention to Use Substances	.552	.960
Father-Adolescent Communication	.012	-.308	Self-Reported Use of Substances	.495	.950
Mother-Adolescent Communication	-.229	-.320			
Parental Use of Substances	.873	.899			
Adolescent Age	.078				
Adolescent Gender	-.027				
PV_P	20.6%		PV_C	91.2%	
Rd_P	3.8%		Rd_C	16.82%	
$\overline{Rd}_P$	4.5%		$\overline{Rd}_C$	17.19%	

$R_c = .429$

$R_c^2{}_1 = .184 = 18.4\%$

β = standardized canonical weights
s = structure coefficients
PV_P = proportion of variance of the independent variables extracted by all canonical variates of the independent variables
PV_C = proportion of variance of the dependent variables extracted by all canonical variates of the dependent variables
Rd_P = redundancy (variance of second predictor variable set explained by the canonical variates of the dependent variables)
Rd_c = redundancy (variance of second criterion variable set explained by the canonical variates of the independent variables)
$\overline{Rd}_P$ = total redundancy (variance of predictor variable set explained by canonical variates of the dependent variables)
$\overline{Rd}_c$ = total redundancy (variance of criterion variable set explained by canonical variates of the independent variables)
R_c = canonical correlation
Rc_2 = proportion of variance shared by the two canonical variates
NOTE: Only structure coefficients ≥.30 are reported.

Communication indicates that an inverse relationship exists with these variables as they relate to the criterion variable set.

The first pair of canonical variates share about 18.4% of the variance (R_c^2 = .184). The variates or canonical variables for the first predictor set accounted for a total of 20.5% of the variance in that set. The variates for the first criterion set accounted for 91.2% of the variance of the dependent variables (Table 5).

Redundancies were calculated for both the predictor variable set and the criterion variable set, given the nature of the research design. An examination of the redundancy coefficients shows that 16.8% of the variance of the dependent variable set is predictable from the first canonical variable of the predictor variables; total predictable variance of the criterion variables from all linear combinations of the predictor variables is 17.2% (Table 5). Similarly, 3.8% of the variance in the predictor set is explained by the first canonical correlation of the criterion variables; total explained variance of the predictor variables from all linear combinations of the criterion variables is 4.5%.

The hypothesis can be said to be partially supported by the canonical correlation analysis. Adolescent Behavioral Intention and Self-Reported Use of Substances was a function of non-balanced Family Adaptation and Cohesion, decreased Father-Adolescent Communication, decreased Mother-Adolescent

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Communication and increased Parental Use of Substances. Adolescent Gender and Age were not supported as variables related to Adolescent Behavioral Intention or Self-Reported Use of Substances.

Canonical Correlation: Model Two

For the second canonical correlation model the predictor and criterion variable sets were redefined to be more specific in their representation of the study variables. The predictor variables were Family Adaptation and Cohesion, Father-Adolescent Communication, Mother-Adolescent Communication, Parental Use of Alcohol, Parental Use of Tobacco Products, Parental Use of Illicit Drugs, Adolescent Gender and Age. The criterion variables were Adolescent Behavioral Intention to Use Alcohol, Adolescent Behavioral Intention to Use Tobacco Products, Adolescent Behavioral Intention to Use Illicit Drugs, Adolescent Self-Reported Use of Alcohol, Adolescent Self-Reported Use of Tobacco Products, and Adolescent Self-Reported Use of Illicit Drugs. A maximum of six variate pairs could be formed in the second canonical procedure. Multivariate tests of significance (Pillai's Trace, Hotelling's Trace and Wilks' Lambda) supported rejection of the null hypothesis that predictor variables were unrelated to criterion variables ($p<.000$).

Dimension Reduction Analysis (Appendix O) revealed that the first two pairs of variates reached accepted levels of significance ($p<.000$). The squared correlation coefficient

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of each statistically significant variate set was greater than .10, therefore, both variate pairs were retained in the subsequent analyses (Appendix P).

The first correlation in Table 6 shows that the predictor variate set was composed of Family Adaptation and Cohesion, Father-Adolescent Communication, Mother-Adolescent Communication, Parental Use of Alcohol and Parental Use of Tobacco (Appendix Q). The criterion variate set consisted of Adolescent Behavioral Intention to Use Alcohol, Tobacco Products, and Illicit Drugs and the Self-Reported Use of Alcohol and Illicit Drugs. Family Adaptation and Cohesion and Parental Use of Alcohol and Illicit Drugs each demonstrated an inverse relationship in the predictor linear combination. Thus the results indicate that decreased Behavioral Intention to Use Alcohol, Tobacco Products and Illicit Drugs and the decreased Self-Reported Use of Alcohol and Illicit Drugs was a function of balanced levels of Family Adaptation and Cohesion, positive levels of Family Communication, and decreased Parental Use of Alcohol and Illicit Drugs.

The first pair of linear combinations was correlated at .469 with an R_c^2 of .220, indicating 22% of the variance was shared by the variate sets. The proportion of variance extracted by the canonical variate of the predictor set was 18.05%, similarly, 39.02% variance in the criterion variate set was accounted for by the canonical variate of the dependent variables. The redundancy index for the

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Table 6

Summary of Model Two Canonical Correlation: First Canonical Variate Set

Predictor variables	β	s	Criterion variables	β	s
Family Adaptation and Cohesion	-.353	-.533	Intention to Use Alcohol	-.324	-.886
Father-Adolescent Communication	-.025	.345	Intention to Use Tobacco Products	-.505	-.495
Mother-Adolescent Communication	.352	.465	Intention to Use Illicit Drugs	-.017	-.482
Parental Use of Alcohol	-.758	-.794	Self-Reported Use of Alcohol	-.653	-.901
Parental Use of Tobacco Products	.015		Self-Reported Use of Tobacco Products	.602	
Parental Use of Illicit Drugs	-.152	-.347	Self-Reported Use of Illicit Drugs	-.046	-.450
Adolescent Age	.070				
Adolescent Gender	-.045				
PV_P	18.05%		PV_C	39.02%	
Rd_P	3.97%		Rd_C	8.57%	
$\overline{Rd}_P$	7.01%		$\overline{Rd}_C$	13.78%	
$R_c = .469$					
$R_c^2 1 = .220$					

β = standardized canonical weights
s = structure coefficients
PV_P = proportion of variance of the independent variables extracted by all canonical variates of the independent variables
PV_C = proportion of variance of the dependent variables extracted by all canonical variates of the dependent variables
Rd_P = redundancy (variance of second predictor variable set explained by the canonical variates of the dependent variables)
Rd_c = redundancy (variance of second criterion variable set explained by the canonical variates of the independent variables)
$\overline{Rd}_P$ = total redundancy (variance of predictor variable set explained by canonical variates of the dependent variables)
$\overline{Rd}_c$ = total redundancy (variance of criterion variable set explained by canonical variates of the independent variables)
R_c = canonical correlation
Rc^2 = proportion of variance shared by the two canonical variates
NOTE: Only structure coefficients ≥.30 are reported.

independent variables, drawn from the first linear combination of the dependent variables was 3.97%. In a like manner, the explained variance of the dependent variables from the first linear combination of the independent variables was 8.57%. Total redundancy was 7.01% for the predictor variable set and 13.78% for the criterion variable set.

The second correlation extracted fewer factors from each variable set to form the statistically significant linear relationship (R_c^2 = .364). For this correlation it could be said that increased Intention to Use Tobacco Products and Illicit Drugs and Actual Use of Tobacco Products was largely a function of increased Parental Use of Tobacco Products and Illicit Drugs (Table 7 and Appendix R). The strongest variables contributing to this correlation were Parents Use of Tobacco Products (s=.918) and Adolescent Behavioral Intention to Use Tobacco Products (s=.747) and Self-Reported Use of the same substance (s=.950).

The squared value for the second canonical correlation indicated 13.2% shared variance between the two linear combinations. The variance of the independent variables extracted by the second canonical variate was 13.95%. Variance extracted by the corresponding variate for the criterion variable set was 28.42%. Redundancy for the independent variate of the second significant correlation was 1.85%, and 3.76% for the dependent variate set (Table 7).

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Table 7

Summary of Model Two Canonical Correlation: Second Canonical Variate Set

Predictor variables	β	s	Criterion variables	β	s
Family Adaptation and Cohesion	-.072		Intention to Use Alcohol	-.260	
Father-Adolescent Communication	.109		Intention to Use Tobacco Products	.013	.744
Mother-Adolescent Communication	.082		Intention to Use Illicit Drugs	.129	.318
Parental Use of Alcohol	-.198		Self-Reported Use of Alcohol	-.033	
Parental Use of Tobacco Products	.929	.918	Self-Reported Use of Tobacco Products	1.093	.950
Parental Use of Illicit Drugs	.186	.374	Self-Reported Use of Illicit Drugs	-.193	
Adolescent Age	.054				
Adolescent Gender	-.217				
PV_P	13.95%		PV_C	28.42%	
Rd_P	1.85%		Rd_C	3.76%	
$\overline{Rd}_P$	7.01%		$\overline{Rd}_C$	13.78%	

$R_C = .364$

$R_C^2{}_1 = .132 = 13.2\%$

β = standardized canonical weights

s = structure coefficients

PV_P = proportion of variance of the independent variables extracted by all canonical variates of the independent variables

PV_C = proportion of variance of the dependent variables extracted by all canonical variates of the dependent variables

Rd_p = redundancy (variance of second predictor variable set explained by the canonical variates of the dependent variables)

Rd_c = redundancy (variance of second criterion variable set explained by the canonical variates of the independent variables)

$\overline{Rd}_p$ = total redundancy (variance of predictor variable set explained by canonical variates of the dependent variables)

$\overline{Rd}_c$ = total redundancy (variance of criterion variable set explained by canonical variates of the independent variables)

R_c = canonical correlation

R_c^2 = proportion of variance shared by the two canonical variates

NOTE: Only structure coefficients ≥.30 are reported.

This canonical procedure supported the first hypothesis: a powerful relationship appears to exist between family adaptation and cohesion, parent-adolescent communication, and parental substance use on the one hand, and the behavioral intention and self-reported use of substances by adolescents. Gender and Age were not significant factors in this relationship.

Hypothesis Two: Balanced Families and the Use of Substances

The second hypothesis stated that adolescents who report balanced levels of Family Adaptation, Cohesion and Communication will report less Behavioral Intention and Actual Use of Alcohol, Tobacco Products and Illicit Drugs. To test this hypothesis the adolescents and their families were classified into groups representing levels of family functioning. T-tests were employed to examine the differences between the two groups of Balanced Families (N=102) and Non-Balanced Families (N=204). The Non-Balanced families were those who had scored in the midrange and extreme levels on the FACES.

Tables 8 and 9 present the results of these tests, indicating that adolescents from balanced families had slight to moderately lower mean scores than the adolescents from non-balanced families on all variables. Despite the fact that these differences were in the hypothesized direction, not all of the differences were statistically significant. Those that were significant ($p<.05$ two-tailed) were those on the dependent variables of Adolescent

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Table 8

The Effect of Balanced Family Functioning on Adolescent Behavioral Intention and Self-Reported Use of Substances: T-test Analysis

	Mean				
	Balanced Families N=102	Non-Balanced Families N=204	t value	df	p
Behavioral Intention to Use Alcohol	9.87 (4.55)[a]	10.65 (4.92)	-1.34	304	.182
Self-Reported Use of Alcohol	8.07 (3.54)	9.19 (4.22)	-2.44	236	.016*
Behavioral Intention to Use Tobacco Products	3.01 (1.56)	3.27 (1.66)	-1.34	304	.180
Self-Reported Use of Tobacco Products	3.04 (1.71)	3.40 (1.90)	-1.62	304	.105
Behavioral Intention to Use Illicit Drug	8.20 (2.84)	8.63 (3.17)	-1.17	304	.241
Self-Reported Use of Illicit Drug	7.43 (1.22)	7.70 (1.53)	-1.64	246	.103
Behavioral Intention to Use Substance	21.08 (7.06)	22.59 (8.13)	-1.57	305	.118
Self-Reported Use of Substance	18.54 (5.19)	20.28 (6.49)	-2.54	246	.012*

[a]Standard deviation in parentheses.

*$p \leq .05$

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Table 9

The Effect of Balanced, Midrange and Extreme Family Functioning on Adolescent Behavioral Intention and Self-Reported Use of Substances: ANOVA

	Mean				
	Balanced Families N=102	Midrange Families N=103	Extreme Families N=101	F	p
Adolescent Intention to Use Alcohol	9.87 (4.55)[a]	9.90 (4.60)	11.42 (5.14)	3.47	.032*
Adolescent Self-Reported Use of Alcohol	8.07 (3.54)	8.49 (3.79)	9.90 (4.52)	5.93	.003**
Adolescent Intention to Use Tobacco Products	3.01 (1.56)	3.35 (1.64)	3.20 (1.68)	1.12	.328
Adolescent Self-Reported Use of Tobacco Products	3.04 (1.71)	3.51 (1.81)	3.29 (1.99)	1.71	.183
Adolescent Intention to Use Illicit Drugs	8.20 (2.84)	8.66 (2.85)	8.60 (3.48)	0.70	.499
Adolescent Self-Reported Use of Illicit Drugs	7.43 (1.22)	7.58 (1.31)	7.81 (1.73)	1.80	.166
Adolescent Intention to Use Substances	21.08 (7.06)	21.91 (7.63)	23.22 (8.60)	1.95	.145
Adolescent Self-Reported Use of Substances	18.54 (5.19)	19.58 (5.19)	21.00 (7.04)	4.20	.016*

[a]Standard deviation in parentheses.
*$p \leq .05$
**$p \leq .01$

Behavioral Intention and Self-Reported Use of Alcohol, and Adolescent Self-Reported Use of All Substances. These results would indicate that the hypothesis was partially supported.

To further evaluate the hypothesis, single factor analysis of variance was employed to the evaluation of three, rather than two, family groups. The three groups were Balanced Families (N=102), Midrange Families (N=103) and Extreme Families (N=101). Placement into these groups was determined by computing the distance from center score for family adaptation, cohesion and communication and coding the scores according to the FACES guidelines (Olson et al., 1985).

The ANOVA findings supported the T-test analysis (Table 9). Differences between groups were significant for the dependent variables of Adolescent Intention and Self-Reported Use of Alcohol ($p<.05$ and $p<.01$ respectively) and Adolescent Self-Reported Use of All Substances ($p<.05$). Other slight differences among population means were apparent, but did not reach a level of significance. These findings remained consistent when Cigarette Use replaced Tobacco Use in the T-test equation.

Two post hoc tests were employed to determine the location of the differences among the three groups and to reduce the incidence of a Type I error (Burns & Grove, 1987). For those differences between means in which the overall F in the ANOVA was significant, the Newman-Keuls

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test comparing all possible pairs of means and Scheffe's test comparing all pairs of means were utilized (Shavelson, 1981). For Substance Use, significant differences occurred between the extreme and the balanced family groups. Post-hoc analysis of Self-Reported Use of Alcohol demonstrated that extreme families were significantly different at the .05 level from both the balanced and the midrange groups. Similar analysis on the Behavioral Intention to Use Alcohol indicated group differences between the extreme and the midrange group as measured by the Student-Newman-Keuls procedure, but not by the Scheffe procedure.

Findings from ANOVA and T-tests partially supported Hypothesis Two. Evidence exists to support the prediction that adolescents from balanced families have less intention to use alcohol, less actual use of alcohol and less actual use of substances overall. Adolescent Behavioral Intention and Self-Reported Use of Tobacco Products and Illicit Drugs did not appear to be predicted by levels of Family Adaptation and Cohesion.

Hypothesis Three: Age and the Use of Substances

Hypothesis Three stated older adolescents (age 16-19) will report a higher usage of alcohol, tobacco products and illicit drugs than younger adolescents (age 12-15). This hypothesis was tested by comparing the distributions of the scores from each substance scale (alcohol, tobacco products, and illicit drugs) and analyzing the differences between the group means using a two-tailed T-test and ANOVA. In

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addition the variable of Cigarette Use was examined in the same manner and no statistically significant differences were found between group means. There was virtually no difference between the group means on any of the tests (Tables 10 and 11). The hypothesis, therefore, was not supported.

Hypothesis Four: Gender and the Use of Substances

The relationship between gender and the use of substances was stated as a null hypothesis that there would be no differences in the overall amount and frequency of substance use between males and females. This hypothesis was tested and positively confirmed utilizing T-tests and ANOVA. The group sizes were very similar (Males=151, Females=155); differences between the means were negligible in all cases (Tables 12 & 13).

Due to concerns regarding the robustness of the tobacco products scale, a secondary analysis of the hypothesis was completed in which Adolescent Self-Reported Use of Cigarettes was substituted for Adolescent Self-Reported Use of Tobacco Products. Eliminating other forms of tobacco from this scale gave a more realistic view of the frequency and type of tobacco product (namely cigarettes) actually being used by the study population. The T-test and the ANOVA revealed that females have a higher usage of cigarettes than males (Tables 12 and 13). This finding did not support the null hypothesis.

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Table 10

The Effect of Adolescent Age on Adolescent Self-Reported Use of Substances: T-test Analysis

	Mean				
	Age 12-15 N=146	Age 16-19 N=160	t value	df	p
Adolescent Self-Reported Use of Alcohol	8.65 (4.04)[a]	8.97 (4.04)	-.70	304	.483
Adolescent Self-Reported Use of Tobacco Products	3.19 (1.86)	3.37 (1.83)	-.87	304	.385
Adolescent Self-Reported Use of Illicit Drugs	7.62 (1.51)	7.60 (1.34)	.10	304	.921
Adolescent Self-Reported Use of Substances	19.45 (6.27)	19.94 (6.02)	-.70	304	.484

[a]Standard deviation in parentheses.

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Table 11

The Effect of Adolescent Age on Adolescent Self-Reported Use of Substances: ANOVA

	Mean			
	Age 12-15 N=146	Age 16-19 N=160	F	p
Adolescent Self-Reported Use of Alcohol	8.64 (4.04)[a]	8.97 (4.04)	.49	.483
Adolescent Self-Reported Use of Tobacco Products	3.19 (1.86)	3.37 (1.83)	.76	.385
Adolescent Self-Reported Use of Illicit Drugs	7.62 (1.51)	7.60 (1.38)	.01	.921
Adolescent Self-Reported Use of Substances	19.45 (6.27)	19.94 (6.02)	.49	.484

[a]Standard deviation in parentheses.

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Table 12

The Effect of Gender on Adolescent Self-Reported Use of Substances: T-test Analysis

	Mean				
	Male N=151	Female N=155	t value	df	p
Adolescent Self-Reported Use of Alcohol	8.74 (4.16)[a]	8.89 (3.93)	-.34	304	.737
Adolescent Self-Reported Use of Tobacco Products	3.41 (2.07)	3.15 (1.60)	1.21	282	.228
Adolescent Self-Reported Use of Illicit Drugs	7.54 (1.28)	7.67 (1.58)	-.78	294	.437
Adolescent Self-Reported Use of Substances	19.69 (6.27)	19.72 (6.02)	-.04	304	.969
Adolescent Self-Reported Use of Cigarettes	1.68 (1.12)	2.07 (1.52)	-2.55	283	.011*

[a]Standard deviation in parentheses.
*$p \leq .05$

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Table 13

The Effect of Gender on Adolescent Self-Reported Use of Substances: ANOVA

	Mean			
	Male N=151	Female N=155	F	p
Adolescent Self-Reported Use of Alcohol	8.74 (4.16)[a]	8.89 (3.93)	.11	.737
Adolescent Self-Reported Use of Tobacco Products	3.41 (2.07)	3.15 (1.60)	1.47	.226
Adolescent Self-Reported Use of Illicit Drugs	7.54 (1.28)	7.67 (1.58)	.60	.438
Adolescent Self-Reported Use of Substances	19.69 (6.27)	19.72 (6.02)	.00	.970
Adolescent Self-Reported Use of Cigarettes	1.68 (1.12)	2.07 (1.52)	.65	.011*

[a]Standard deviation in parentheses.
*$p \leq .05$

Hypothesis Five: The Effects of Parental Substance Use

Hypothesis Five stated adolescents whose parents use alcohol, tobacco products and illicit drugs will report a higher usage of these same substances than those whose parents do not use these substances. This hypothesis was examined using T-test and ANOVA. For the analysis parental use for each individual substance was compared to adolescent use of the same substance. Parental Use was defined as any parent who had used the substance at any point in their life. Adolescent Use was defined as any adolescent who uses that substance a few times a year or more. Tables 14 and 15 present a summary of these results. Note that group sizes differ with each particular substance. The hypothesis was strongly supported, and confirmed that parental use of substances has a direct and positive impact upon adolescent use of these same substances.

Summary

The results of the data analysis confirmed that a significant relationship exists between adolescent perception of family adaptation, cohesion and parent-adolescent communication and the behavioral intention and self-reported use of several substances by the adolescent subjects. In addition adolescent reports of parental substance use were highly associated with adolescent substance use. A strong relationship exists between non-balanced families and adolescent intention and actual use of alcohol and substances in general. Adolescent gender and

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age have little if any significant relationship to adolescent substance use as indicated by the hypothesis testing. The interpretation of these results and their implications for nursing will be discussed in the last chapter.

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Table 14

The Effect of Parental Substance Use on Adolescent Self-Reported Use of the Same Substances: T-test Analysis

	Mean						
	Parents Do Not Use Substances	N	Parents Do Use Substances	N	t value	df	p
Adolescent Self-Reported Use of Alcohol	6.17 (3.51)[a]	30	9.10 (3.99)	276	-3.87	304	.000***
Adolescent Self-Reported Use of Tobacco Products	2.73 (1.23)	116	3.62 (2.07)	189	-4.71	303	.000***
Adolescent Self-Reported Use of Illicit Drugs	7.48 (1.28)	247	8.17 (1.89)	58	-2.65	70	.010**
Adolescent Self-Reported Use of Substances	16.35 (5.40)	23	19.98 (6.12)	283	-2.76	304	.006**
Adolescent Self-Reported Use of Cigarettes	1.54 (1.06)	124	2.12 (1.47)	181	-3.96	302	.000***

[a]Standard deviation in parentheses.
**p≤.01
***p≤.001

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Table 15

The Effect of Parental Substance Use on Adolescent Self-Reported Use of the Same Substances: ANOVA

	Mean					
	Parents Do Not Use Substances	N	Parents Do Use Substances	N	F	p
Adolescent Self-Reported Use of Alcohol	6.17 (3.51)[a]	30	9.10 (3.99)	276	14.97	.000***
Adolescent Self-Reported Use of Tobacco Products	2.73 (1.23)	116	3.62 (2.07)	189	17.65	.000***
Adolescent Self-Reported Use of Illicit Drugs	7.48 (1.28)	247	8.17 (1.89)	58	11.26	.001***
Adolescent Self-Reported Use of Substances	16.35 (5.40)	23	19.98 (6.12)	283	7.60	.006**
Adolescent Self-Reported Use of Cigarettes	1.54 (1.06)	124	2.12 (1.47)	181	13.96	.000***

[a]Standard deviation in parentheses.
*p≤.05
**p≤.01
***p≤.001

Chapter Five

Discussion and Implications

Introduction

This chapter will present an evaluation and interpretation of the results, linking the current findings with those discussed in the literature review. Strengths and limitations of the study as they relate to the external and internal validity of the research will be discussed. Implications for, and contributions to nursing research, practice, and education are presented.

Discussion

Family Functioning and Adolescent Substance Use

The relationship between family functioning and adolescent substance use has been poorly understood and inadequately addressed in both the nursing and behavioral sciences literature. Using an explanatory correlational design this study indicated that a strong relationship exists between levels of family adaptation, cohesion and parental-adolescent communication and the choices an adolescent makes concerning use of alcohol, tobacco products and illicit drugs. In addition, parental role-modeling, as indicated by adolescent reports of parental substance use, has a direct relationship to the use of similar substances by the teenager.

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Two canonical correlation analyses were performed to identify the relationships between sets of independent and dependent variables. The first canonical model analyzed the relationships between the predictor variables of Family Adaptation and Cohesion, Parent-Adolescent Communication, Parental Use of Substances, Adolescent Age and Gender and the criterion variables of Adolescent Behavioral Intention to Use Substances and Adolescent Self-Reported Substance Use. This analysis yielded one significant and meaningful canonical correlation indicating non-balanced levels of family adaptation and cohesion, poor parent-adolescent communication and increased use of substances by parents was inversely related to both the intention to use and the self-reported use of substances by adolescent subjects.

The second canonical model yielded two significant and meaningful correlations using larger and more specific variable sets. The first correlation revealed that balanced levels of family adaptation and cohesion, open parent-adolescent communication, and decreased parental use of alcohol and illicit drugs were directly related to decreased intention to use alcohol, tobacco products and illicit drugs and decreased actual use of alcohol and illicit drugs by adolescent subjects. The second correlation indicated that parental use of tobacco products and illicit drugs was directly related to adolescent intention to use tobacco products and illicit drugs and the reported use of tobacco products.

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Variances between and within variable sets were examined and redundancy indices were computed for all significant correlations. The variables examined in this study explained moderate to large amounts of variance in the relationship between adolescent substance use and the specified family functioning variables. Adolescent use of substances is known to be influenced by a variety of factors. Some of these factors include: peer influence, ethnicity, social class, grade average, involvement in extracurricular activities, working environment and involvement in church activities. Given this large scope of variables, this study was able to demonstrate that family adaptation, cohesion, parent-adolescent communication and parental role modeling can explain a considerable amount of variance in relation to the behavioral intention and self-reported use of substances by adolescents. Conversely, adolescent behavioral intention and self-reported use of substances accounted for a significant amount of variance in relation to family functioning. Future data analysis examining a multiplicity of these variables in a canonical model would be both interesting and informative.

Further hypothesis testing confirmed several of the relationships revealed by the canonical analysis. Parental use of substances was a strong predictor of adolescent use of the same substances. The adolescent will use substances that the parent has used or is using. This finding has been documented and supported by Barnes and Windle (1987), Biddle

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et al. (1980), Marguiles et al. (1977) and Thompson and Wilsnack (1987). In these studies it was found that parental role modeling was positively related to adolescent substance use. Furthermore, if parents even mildly sanctioned substance use by their child, that adolescent was more likely to use the product. The current research confirms that parental role modeling continues to have a powerful influence upon the behavior of the child, especially through the adolescent years.

The quality of the relationship between the adolescent and his parent(s) demonstrated a substantial relationship with adolescent decision-making concerning substance use. Adolescents from non-balanced families were more likely to use substances. In particular, this was found in relation to the intention and self-reported use of alcohol by adolescents. Nationwide, alcohol is the most widely used substance by adolescents (Johnston et al., 1988). It is a substance that unlike tobacco products, can alter one's sensory perceptions. It is much easier, and cheaper to obtain than illicit drugs. It is a product promoted on television as a method to relax and loosen up from the stress and pressures of the day (Barton & Godfrey, 1988). Thus it is not surprising that the availability and acceptability of consuming alcohol appears to be more prevalent by adolescents from non-balanced versus balanced families.

Poor adolescent-parent relationships have been found to

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be predictive of illicit drug use in early and late adolescence, but not in mid-adolescence (Potvin & Lee, 1980). This study would appear to support this finding from the literature; illicit drug use by the subjects in this study was not correlated with poor family functioning. Reported illicit drug use was extremely low in the study population. Research utilizing a larger sample size which extends over the entire adolescent age range is needed to further confirm this finding.

Olson, McCubbin, et al., (1983) contend that balanced levels of family adaptation and cohesion are necessary for dealing with the demands and stressors that often seem inherent to the adolescent stage. Furthermore, positive communication skills enable the family to share with each other their changing needs and preferences as they relate to levels of adaptation and cohesion (Olson, 1989). The balanced families in this study were characterized as having open and honest communication patterns between adolescents and their parents. In these same families, adolescents were less likely to use substances. This finding supports the proposition that adolescents from balanced families will not use substances as often as will those adolescents from non-balanced families.

Age and Substance Use

The age of the adolescent had no significant impact on reported differences in substance use among participants. This finding was not consistent with previous research which

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indicated that use of substances increased with age, grade level and graduation from high school (O'Malley et al., 1984; Swisher et al., 1984; White & Swisher, 1989; Wolford & Swisher, 1986).

Discrepancy between the findings of this study and previous research can be accounted for by the homogeneous characteristics of the study population. The majority of participants were tenth graders (89.3%), fifteen and sixteen years of age (87.7%). Given the lack of variance among age groups and grade levels it was not surprising that group differences were not discerned from the data. This study needs to be replicated among other age groups to further examine group differences by age.

Gender and Substance Use

Data analysis appeared to confirm the hypothesis that there were no differences in alcohol, tobacco products and illicit drug use among male and female subjects. However, secondary analysis of the data using the Cigarette Use Scale revealed that females were more likely to smoke cigarettes than males. These findings were consistent with previous research.

It can generally be stated that gender differences in substance use are becoming less significant in recent years (Wechsler & McFadden, 1976; Weschler & Thum, 1973; Winfree et al., 1981). The differences that have been documented are in reference to the specific type of substances which one gender seems to prefer more than the other. For

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instance this study was consistent with previous research indicating that females were more likely to use cigarettes than males (Earls & Powell, 1988; Johnson et al., 1988; White & Swisher, 1989: Wolford & Swisher, 1986). Conversely, previous research indicates that males were more likely to use smokeless tobacco products than females (Ary et al., 1987; Dent et al., 1987).

It is recommended that future studies examine gender differences in relation to each of the thirteen substances listed on the adolescent use scales. This analysis could yield data concerning the specific substances which male or female adolescents may prefer to use.

Strengths and Limitations

Internal Validity

The relationships identified by the canonical correlations and the hypothesis testing are both plausible and credible. The theoretical framework which was comprised of family and individual developmental theory and the Circumplex Model supported the significance of family functioning as an influence upon adolescent behaviors and actions. Similar findings from previous research concerning adolescents and substance use bolstered the credibility and validity of the current findings.

Translation of the scores from the Parent-Adolescent Communication Scale into a framework designating balanced versus non-balanced levels of communication would have been helpful for use in the data analysis. Balanced families

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could only be identified and assessed on the basis of the FACES. Utilization of an instrument which specifically measured family communication in relation to the levels of family functioning as identified in the Circumplex Model would have provided a stronger link between the conceptual framework and specific hypothesis testing.

There existed strong consistency in the translation of the study question to the choice of subjects, situation and procedure (Krathwohl, 1985). Subjects were adolescents, given free choice to participate in the study. The data collection procedure protected human rights and assured confidentiality of findings, thereby providing an environment in which the adolescent could confidently share their thoughts without fear of punishment for their actions. Operational definitions of the variables were consistent with the study design and with the data collection instruments.

The data appeared to be authentic. One question on the substance use scales was bogus and helped to identify those subjects who may have exaggerated about their drug use. Subjects choosing this substance were eliminated from the data analysis.

The sample size was greater than 200, or 25 subjects per variable, and therefore met the sampling criteria necessary to interpret the results with a degree of confidence (Burns & Grove, 1987; Waltz & Bausell, 1981). The sample used was consistent with that implied by the

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problem statement. The use of inferential statistics and the multivariate tests of significance indicated that the results did not occur by chance, nor are they a product of sampling or measurement error.

Although statistical assumptions related to normality and linearity were only partially met, canonical correlation analysis and the use of T-tests and ANOVA were appropriately used for hypothesis testing. These methodologies are robust to violations of these assumptions, especially when the sample size is large. SPSS-X (1988) was used to analyze the data and several authoritative sources concerning canonical correlation techniques were utilized as guides for the data analysis and interpretation, including Darlington et al. (1973), Levine (1977), McLaughlin and Otto (1981), Pedhazur (1982), Tabachnick and Fidell (1983) and Thompson (1984).

The results of the hypothesis testing confirmed previous research findings. Rival explanations may have included maturation (fatigue concerns) and diffusion caused by adolescents from one class sharing information concerning the data collection with students in a later class. Biases resulting from selection and recruitment of subjects was not likely to have occurred since all students in the Health and Safety classes were asked to participate.

In light of the preceding considerations the internal validity of this study is considered to be quite strong (Krathwohl, 1985). The data supported the hypotheses in such a manner that there was consistency with previous

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related studies.

External Validity

The external validity or generalizing power of this study was quite hardy. Selection of high school students from a variety of cultural and socioeconomic backgrounds promotes generalization of the results to other populations of students of the same age group. Generalization of findings to younger and older subjects should be approached cautiously given that family dynamics are thought to vary depending upon the age of the children and the related developmental needs of other family members.

Data collection was completed twice to obtain the sampling requirements. The first sampling unit was comprised of students who had spent an entire semester together in class. The second group of subjects had been together in class for only three weeks. The diversity in the degree of familiarity among subjects enhances generalizability; the social environment did not appear to have adverse effects upon the subject's openness as they responded to the questionnaires. That the subjects were able to respond openly and honestly is a point further validated by the consistency of the study results with those of previous research.

Restrictive explanations were eliminated through randomization of subjects and through participation of students in a class in which completing surveys and meeting guest speakers were normative activities. For both the

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parents and the adolescents, it was not uncommon to be asked to participate in a special activity associated with health and safety issues.

Strict confidentiality was maintained throughout the data analysis procedures. Emphasis was placed upon the anonymity of answers and the assurance that no right or wrong answers existed; rather, each person's responses reflected their unique thoughts about the subject of each question.

To further increase external validity, this research could easily be replicated since sampling procedures were well-described and data collection instruments were considered to have good psychometric properties. Use of different instruments which measure family adaptation, cohesion and communication as well as adolescent use of substances would be expected to reveal similar results, assuming valid instrumentation and the operational definitions of the variables were consistent with those used in the present study. Other types of research designs might be considered to both substantiate and explicate the results of this study. Directionality and causal relationships could be explored given the current findings.

Implications for Nursing Research

This study was unique in that it sought to explore the relationships between adolescent substance use and family functioning from the perspective of the adolescent. Nursing research has been criticized for its lack of focus upon

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family-centered issues, especially those concerning children and adolescents (Barnard, 1980; Denyes, 1983; Feetham, 1984; Friedman, 1986; Lynch, 1983; Whall, 1980). This paucity of family-oriented research can be related to difficulties in acquiring consent of minors and to the lack of family theories developed by nursing scholars.

Gaining access to subjects who are minors is often a difficult task for the researcher. Not surprisingly, parents, and in the case of this study, school district administrators, can be very protective of the children in their charge. The investigator must be both creative and persistent in order to conduct a study which elicits the thoughts and opinions of young people. School officials are likely to be concerned about the legal liabilities and privacy issues associated with research using subjects who are considered to be minors in the legal domain. Establishing credibility with the school nurse, administrative personnel and the teaching staff is a critical step in the research process for the investigator. This study was rejected by several school districts prior to acceptance by the participating school. Concerns related to violating privacy of the adolescent and his family unit were the most prominent reason school officials rejected the research proposal.

Some of the findings from this study are limited because the sample was not representative of the entire age spectrum of the adolescent population. The sample was

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homogeneous, primarily because of limitations placed upon the researcher by the school district concerning which classes were appropriate and most convenient for data collection. Future research endeavors include returning to the school district and seeking permission to duplicate the study with ninth and twelfth graders. Additional schools will be approached in an effort to duplicate the study in environments in which demographic characteristics may vary from the current sample.

The use of canonical correlation techniques provides one method by which to evaluate health related issues which are influenced by multidimensional concepts and multiple predictors (McLaughlin & Otto, 1981). Although canonical correlation analysis has not been widely used and may appear very complicated, it is considered to be a statistical method which can yield a rich data base (Thompson, 1984). Its limitations include difficulty in interpreting results and the lack of consistency among researchers concerning the terminology and the standards for interpretation of significant data.

Additional research using canonical correlation analysis is recommended in the area of adolescent substance use. Many factors have been identified in the literature as influencing the decision to use substances. Using canonical correlation techniques, the multiplicity of variables could be addressed with specific emphasis upon the simultaneous influence of multiple factors on adolescent thoughts and

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behaviors.

This research has borrowed developmental theory and the Circumplex Model from other social science disciplines. These theories provided a strong theoretical framework from which to address a health care issue which confronts those who work with adolescents. The research process successfully provided a bridge between a nursing issue and family developmental issues as addressed by other professions. The concepts of family adaptation, cohesion and communication need to be further tested using models such as the Circumplex Model and through development of frameworks that emerge from the process of both qualitative and quantitative research.

The relationship between adolescent substance use and the family environment needs to continue to be scientifically addressed. In 1980, Richard Blum, the Chairman of the International Research Group on Drug Legislation and Programs, stated:

> It is time to learn more about how the family prevents most youngsters from becoming drug-using problems, to test how to reach and help less wise parents do better at this, and to experiment with improvements in family therapy (p. 114).

Research evidence exists that use of substances has origins in the family (Hawkins et al., 1986). This is supported by the findings of the current research. Investigation of family related issues and concurrent initiation of family

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intervention studies is called for in light of the cumulative research findings to date and the broadening scope of the adolescent substance use problem.

Implications for Nursing Practice

Providing health care and health education to the adolescent has historically been a difficult process. Federal, state and local regulations have often prohibited adults from discussing certain health care issues with elementary and secondary students (Ely & Erickson, 1989). More recently, the growing amount of substance use, pregnancies and sexually transmitted diseases seen in the younger population has brought a sense of urgency by school and health care personnel to educate young people concerning the risks and consequences of their behaviors.

Debate has arisen concerning the most effective method to prevent young people from using substances and to encourage health-promoting behaviors. Prevention programs have been moving beyond the simple provision of information about drugs and their side effects. Sophisticated prevention programs are emerging in the community which are based upon research findings. These studies have identified some of the underlying factors which are presumed to affect the use of substances by adolescents (Shore, 1985). Currently there exists aversion programs, alternative activity programs, peer-pressure programs, preventative action programs and many more.

This research has demonstrated that poor family

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relationships are factors which are strongly correlated with adolescent substance use. As such, the relationship between the adolescent and his parent(s) should be taken into consideration when implementing programs related to drug prevention and abuse. One author who strongly believes this concept has stated:

> If our country is serious in its apparent wish to attack the phenomenon of drug abuse, the way to do so is not to develop drug abuse programs, but instead to develop a system that will support and foster family life (Auerswald, 1980, p. 117).

The absence of strong family relationships and appropriate role modeling by parents appears to highly influence adolescent choices. Therefore the challenge for the clinician is two-fold: to prevent adolescent substance use, and to support positive family relationships. To accomplish this task drug prevention programs need to elicit parent participation, encourage health promotion education to all family members and provide the adolescent and her parents with methods to effectively cope with family problems. Clearly, drug prevention is not merely a process of changing behaviors, it is also a process of changing attitudes about oneself and one's family.

Professionals working with adolescents using substances need to evaluate the home environment to assess the impact familial relationships may be having upon the young person's behaviors. Conversely, if it is known that an adolescent is

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having difficulties at home and if it is known that their parent uses alcohol, tobacco products or illicit drugs, adolescent use of substances should then be investigated. Adolescents experiencing problems with family relationships are a potential high-risk group for substance use and other destructive behaviors (Hawkins et al., 1986). Early identification of these high-risk adolescents is important as we discriminate between substance use and abuse, and attempt to prevent substance use from becoming a factor which impairs future growth and development (Shore, 1985).

The results of each questionnaire used in this study can be useful to healthcare professionals and school officials. The PPAAUS was designed to be used in planning for curriculum changes, policy development, program recommendations and program evaluation (Swisher et al., 1984). Several scales from this instrument were not used in the current data analysis, though all of the results will be shared with the participating school district. This information will be used as baseline data to plan prevention programs that are being funded by tobacco tax monies recently available to the school district.

Implications for Nursing Education

The concept of family-centered nursing care needs to be a fundamental principle that permeates all levels of nursing education. This study demonstrated how closely the thoughts and actions of the adolescent are tied to the family environment of which they are an essential part. The

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adolescent, the patient, the recipient of health care, should not be addressed outside of the context of his or her own family. As nurses learn about the developmental processes of the individual, this information must be taught within the context of the family life cycle; that is, within a family concurrent developmental processes are occurring which can simultaneously affect family functioning. Including the entire family in the education, treatment and preventative management of the patient or client should be a fundamental principle guiding nursing practice and education.

Summary

This explanatory correlational design focused upon the relationships between adolescent perception of family adaptation, cohesion and parent-adolescent communication, parental use of substances, adolescent age and gender and the behavioral intention and self-reported use of substances by adolescents. Gender and age were found to have no significant influence upon adolescent substance use in this population, a population which consisted primarily of fifteen and sixteen year old students. The hypothesis testing confirmed that a strong correlation exists between a family's level of adaptation, cohesion and parent-adolescent communication and the behavioral intention and self-reported use of alcohol, tobacco products and illicit drugs by teenage family members. In addition, young people are strongly influenced by the role modeling of their parents as

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they make choices concerning their own substance use.

The issues of internal and external validity were addressed, and a high level of both was evident in this study. Additional research is needed to replicate the findings with a larger and more differentiated sample. In addition, other variables such as peer influence and alternative social activities could be added as variables to the canonical model to establish their association with the family functioning variables.

It was suggested that substance prevention programs address family issues and concerns as relevant factors that may influence the initiation and continued use of alcohol, tobacco products and illicit drugs by adolescents. In addition, as role models of adolescent behavior, parents must be involved in substance prevention programs. Furthermore adolescents and their parents must be given strategies to promote a family environment which can cope with the stresses and strains of everyday life.

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Appendix A

Empirical Elements of Substance Use Studies (Part I and II)

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Appendix A

EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part I

Study	Sample	Focus
Ary, Lichtenstein & Severson (1987)	3,023 Adolescents Tested twice in 9 months.	Prevalence and patterns of smokeless tobacco use. The relationship between tobacco use and other drug use is examined.
Atkins, Klein & Mosley (1987)	44 Black students	Attitudes towards substances, level of use, extent of participation in alternative activities.
Bank, Biddle, Anderson, Hauge, Keats, Keats, Marlin, & Valantin (1985)	429 Adolescents from USA, Australia, France & Norway	Social predictors of alcohol use. Influence of peer and parent modeling.
Barnes & Windle (1987)	673	Family and peer factors' relationship to alcohol and drug use.
Bauman & Bryan (1983)	1,555 Seventh graders	Determine whether subjective expected utility (consequences of drinking) accounts for the difference by sex in beer drinking patterns.
Bentler (1987)	700 Adolescents Longitudinal study over 8-year period.	Assess influence of drug use on personality, and personality on drug use.
Biddle, Bank & Marlin (1980)	149 Adolescents	Extent to which drinking is influenced by parents and peers, whether drinking is affected more by preferences or norms, influence of social factors on drinking.
Binion, Miller, Beauvais & Oetting (1988)	144 Indian & 377 Non-Indian eight-grade students	Rationales for alcohol, marijuana and other drug use among Indian and non-Indian youth.
Block, Block & Keyes (1988)	105 Adolescents All age 14, from longitudinal study of ego and cognitive development	Early personality and psychosocial antecedents of drug usage.
Bonaguro, Rhonehouse & Bonaguro (1988)	161 Fifth-eighth graders in four health education projects	Evaluate the effectiveness of school health education projects on substance use, self-esteem and stress.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part I *Continued*

Study	Sample	Focus
Bradley (1984)	249 Adolescents	Adolescent health beliefs and adolescent health practices.
Brown & Stetson (1988)	94 Adolescents and their parents	Compare adolescent and adult evaluations of the effectiveness of coping strategies to limit or stop adolescents from drinking.
Brunswick & Boyle (1979)	535 Black adolescents	Incidence and prevalence of various illicit drug practices in a low socioeconomic population.
Brunswick, Merzel & Messeri (1985)	426 Black youth now age 26-31, longitudinal study over 8-year period	Age of onset of drug use, diminution of drug use with increasing age, sex variances in drug use.
Carter & Robson (1987)	(1981) 173 Youths age 10-15, (1985) 156 youths	Epidemiological characteristics of two groups of youths who were all admitted to ER for drug misuse in Liverpool, England.
Dembo, Dertke, LaVoie, Borders, Washburn & Schmeidler (1987)	145 Juveniles from a detention center	Influence of child physical and sexual abuse variables on the youths' illicit drug use.
Dent, Sussman, Johnson, Hansen & Flay (1987)	2,714 eighth- and ninth-graders, longitudinal over 1-year period	Prevalence of smokeless tobacco use, relationship to other drug use and other psychosocial predictors.
Earls & Powell (1988)	2,415 Adolescents using primary health clinics over a 2-year period	Patterns of use and abuse of substances over a two-year period, and the association between these patterns and other social and behavioral problems.
Eckert (1983)	200 Adolescents	Ethnographic description of the social context in which smoking occurs. Implications for smoking prevention programs.
Elder, Molgaard & Gresham (1988)	433 Sixth- and seventh-graders	Predictors of chewing tobacco and cigarette use.
Forney, Forney & Ripley (1988)	3,017 Sixth-twelfth grade adolescents	Determine if knowledge, attitudes and behavior regarding use of alcohol were correlated, and if these correlations are mediated through age, sex and race.
Forslund & Gustafson (1970)	654 High school seniors	Influence of peers, parents and sex differences on drinking.
Grimes & Swisher (1988)	5,887 Sixth-twelfth grade adolescents	Examine the reasons for not using substances in relation to the amount of actual self-reported use.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part I *Continued*

Study	Sample	Focus
Johnston, O'Malley & Bachman (1987) (1988). And O'Malley, Bachman & Johnston (1984)	17,000 High school seniors	Levels and trends in the use of substances.
Kandel (1975). And Kandel & Faust (1975)	5,468 Adolescents tested three times over a 2-year period	Extent, frequency and progression of substance use over time.
Kandel & Logan (1985)	1,325 young adults from a 5-year longitudinal study	Patterns of initiation, continued use and decline in drug use.
Kulbock, Earls & Montgomery (1988)	2,787 Adolescents clinic patients from a 2-year longitudinal study	Interrelationships among a range of health habits, risk behaviors and social or leisure activities.
Maddahian, Newcomb & Bentler (1988)	847 Adolescents from four ethnic groups	Examine mean differences between ethnic groups' early intention to use, current use and future drug use.
Marguiles, Kessler & Kandel (1977)	1,936 Adolescents A 1-year longitudinal study	Predictors of onset of drinking in a sample from which 30% progressed from non-users to users.
Marston, Jacobs, Singer, Widaman & Little (1988)	77 "Non-user" adolescents compared with 767 "users"	Examines self-reported psychological and social characteristics of a group of students who indicated complete abstinence from substance use.
Moskowitiz & Jones (1988)	543 High school administrators	Gather information about the nature and extent of school problems with student drug use.
Mott & Haurin (1988)	5,444 Adolescents < 19 from a 4-year longitudinal study	Describe the overt relationship over time of early substance use and early sexual activity.
Murray, Roche, Goldman & Whitbeck (1988)	4,249 Ninth-graders	Describe the association of smokeless tobacco use with demographic and drug-use variables.
Oetting & Beauvais (1981)	9,000 Indian young people	Epidemiology of drug use by American Indian youth during the period 1975-81, and compared with three other national surveys conducted over the same period.
Palmore & Shannon (1988)	57 Pregnant students	Identify the risk factors of pregnant adolescents.
Paton & Kandel (1978)	8,206 Adolescents	Clarify the relationship between four psychological factors (depressive mood, normlessness, isolation and self-esteem) and drug use.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part I *Continued*

Study	Sample	Focus
Potvin & Lee (1980)	1,121 Adolescents	Correlates of alcohol and drug use in three adolescent age groups.
Prendergrast & Schaefer (1974)	57 Adolescents	Correlates of drinking and drunkenness.
Reynolds & Rob (1988)	1,270 Adolescents in Sydney, Australia	The role of family difficulties in adolescent depression, drug-taking and other problem behaviors.
Riggs & Chen (1988)	600 Adolescents	Health needs assessment and students' willingness to use a school-based clinic.
Rundall & Bruvold (1988)	47 Smoking and 29 Alcohol school-based intervention programs	Meta-analysis of effectiveness of smoking and alcohol use prevention programs.
Schwartz, Hoffman & Jones (1987)	35 Adolescents in a drug treatment program	Behavioral, psychosocial and academic correlates associated with frequent marijuana use.
Smith, Schwartz & Martin (1989)	28 Adolescents in a drug rehabilitation program	Habits and experiences of teenagers who became addicted to cocaine and participated in a rehabilitation program.
Smith, Canter & Robin (1989)	499 Adolescents	Mediational influences of 12 composite variables on drinking behavior.
Swisher (1988)	11,175 Ninth-twelfth grade adolescents	Overview of the extent and type of drinking patterns and identified factors associated with risky driving and riding practices.
Swisher & Bibeau (1987)	13,998 Adolescents	Assessment of adolescent drinking and driving practices.
Swisher & Hu (1983)	14,000 Seventh-twelfth grade adolescents	Evaluates four approaches to prevention based upon the literature and survey of student attitudes and usage.
Swisher, Nesselroade & Tatanish (1985)	869 Junior high school students	Evaluation of a prevention program through pre-test and post-test measures.
Swisher, Shute & Bibeau (1984)	22,000 Adolescents	Establish reliability and validity of tool designed to measure extent of substance use.
Thorton (1981)	617 Adolescents	Relationship of marijuana use to several types of self-reported delinquent behaviors.
Thompson & Wilsnak (1987)	839 Adolescents from a 2-year longitudinal study	Compare how much parental modeling of drinking, parental attitudes towards adolescent drinking and parent-child conflict influence adolescent drinking.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part I *Continued*

Study	Sample	Focus
Wechsler & McFadden (1976)	1,737 Adolescents	Sex differences in alcohol and drug use.
Wechsler & Thum (1973)	1,922 Adolescents	Association between drinking and illicit drug use, and social correlates.
Welte & Barnes (1987)	27,335 Adolescents	Prevalence of drinking, quantity of consumption, relationship between drinking and social problems, and drinking and drug use in white versus minority groups.
White (1988)	1,308 Adolescents from a 3-year longitudinal study	Patterns of cocaine use over time and the relationship to other drug use.
White & Swisher (1989)	2,674 Sixth-twelfth graders	Profile of adolescent use, intention to use and social correlates of substance use.
Windle & Barnes (1988)	124 Adolescents	Similarities and differences in correlates of alcohol consumption and problem behaviors.
Winfree, Theis & Griffiths (1981)	605 Adolescents	Examines how variables implied in social learning and control theory explain the variance in patterns of smoking and marijuana use in various ethnic groups.
Wolford & Swisher (1986)	9,403 Seventh- through twelfth-grad adolescents	Assess the relationship between behavioral intention to use and self-reported use of substances.
Yamaguchi Kandel (1984a)	1,325 Young adults from a 5-year longitudinal study	Investigate pathways of progression of drug use in adolescents over time.
Yamaguchi & Kandel (1984b)	1,325 Young adults from a 5-year longitudinal study	Predictors of the progressive use of drugs.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part II

Study	Variables	Results
Ary, Lichtenstein & Severson (1987)	Gender, tobacco, marijuana and alcohol use.	60% males have tried smokeless tobacco and 7% use daily. 86% of initial use occurred in setting with other boys. Use use was related to concurrent use of other drugs.
Atkins, Klein & Mosley (1987)	Alternative activities, attitudes towards use, self-reported use.	High percentage reported negative attitudes towards substances and actual usage was extremely low; students spend increased time in alternative activities.
Bank, Biddle, Anderson, Hauge, Keats, Keats, Marlin & Valantin (1985)	Culture, internalization vs. instrumentality, peer and parent modeling.	Internalization rather than instrumentality is reason for effective social influence. Peer modeling has significant internalizing effect on drinking in all four countries, influence of parent modeling varies by country.
Barnes & Windle (1987)	Alcohol use, illicit drug use, deviant acts, family structure and decision-making, parental socialization factors.	Parental support, specific parental guidelines and parental attitudes were significant predictors of substance use and deviant acts. Conflict between parent and peer attitudes had significant impact on substance abuse and deviant acts.
Bauman & Bryan (1983)	Gender, beer drinking behavior, expected consequences of drinking beer.	Males more likely to drink beer than females, this accounted for by the youths' perceptions of the expected consequences of drinking.
Bentler (1987)	Cannabis use, self-acceptance, self-derogation, law abidance.	Higher levels of self-acceptance lead to subsequent lowered use of cannabis in early and late adolescence.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part II *Continued*

Study	Variables	Results
Biddle, Bank & Marlin (1980)	Age, gender, race, social class, norms and behaviors of parents and peers, alcohol use, own norms and preferences.	Personal preferences were very important in determining use, parents influence use through normative standards and peers through modeling behavior; drinking is controlled more through internalization than by instrumentality.
Binion, Miller, Beauvais & Oetting (1988)	Indian versus non-Indian	All use drugs to enhance positive affective states for excitement, for parties, to be with friends, to relax and to handle negative affective states. Indians use drugs to cope with boredom.
Block, Block & Keyes (1988)	Personality Q-sort, home environments, parental childrearing orientations, gender.	Both sexes' use of marijuana RT ego undercontrol, use of harder drugs RT absence of ego-resiliency. Early family environment was RT drug use in girls but not in boys; these homes identified as unstructured and laissez-faire with little pressure to achieve. Character structure measured during nursery school years can foreshadow later drug use.
Bonaguro, Rhonehouse & Bonaguro (1988)	Substance use, self-esteem, stress symptomology.	Predominant educational method of programs was lecture and discussion. No significant differences on pre- and post-test. The effectiveness of school health education needs to improve.
Bradley (1984)	Gender, health beliefs, health practices.	< 10% said they refrained from drugs to stay healthy or believed one should. Alcohol use was the substance most prevalent.
Brown & Stetson (1988)	Adults versus adolescents, coping options.	Adolescents' repertoire of coping options is more limited than that of adults. This may negatively influence their success when attempting to limit or stop alcohol consumption as compared with adults.
Brunswick & Boyle (1979)	Age of initiation, prevalence trends, birth cohort.	High rates of use in this community. Drug use initiation is a result of psychosocial pressures experienced at particular developmental stages.
Brunswick, Merzel & Messeri (1985)	Gender, prevalence trends, heaviness of involvement trends.	Broader acceptance of drug use by males, but greater commitment to use by females. No consistent reduction of involvement from earlier years of initiation, increase use of cocaine and PCP.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part II *Continued*

Study	Variables	Results
Carter & Robson (1987)	Age, duration of admission, outcome of admission, "top ten" drugs taken, reasons for drug use.	Many admissions were associated with suicide attempts. A variety of drugs were used with an increase in use of solvents and "magic mushrooms." The number of admissions does not reflect true extent of problem.
Dembo, Dertke, LaVoie, Borders, Washburn & Schmeidler (1987)	Gender, race, self-derogation, sexual victimization, physical abuse, drug use.	Females had greater self-derogation, sexual and physical abuse and increased frequency of drug use than males. For both groups, sexual victimization and physical abuse had direct effects on drug use. Race had no effects.
Dent, Sussman, Johnson, Hansen & Flay (1987)	Gender, ethnic, substance use, peer and parental norms and behaviors.	Predominance of trial use of tobacco found in males in eighth and ninth grades. Smokeless tobacco use highly correlated to later cigarette use, and onset of use more probable in those who had tried other substances. Parents not related to use onset, but peers strong influence.
Earls & Powell (1988)	Gender, drug use, progression of use, depressive symptoms, conduct problems, legal problems.	Sex differences in substance use less predominant in youth; regular tobacco use influenced progression to substance abuse; one-third were using drugs and continued to do so over the two-year period; those still using had increased depression, conduct and legal problems.
Eckert (1983)	Socioeconomic status ("jocks" versus the "burnouts").	Social polarization and the symbolic values of smoking account for the forces behind the "burnouts" smoking and the "jocks'" abstinence.
Elder, Molgaard & Gresham (1988)	Gender, ethnicity, SES, tobacco use, parents and peer use.	One-third of youth had used tobacco at least once. Norm preferences and best friend's habits, parental marital status and ethnicity predicted smoking and chewing experimentation and prevalence.
Forney, Forney & Ripley (1988)	Age, gender, ethnicity, alcohol use, alcohol knowledge, alcohol attitudes.	Knowledge, attitudes and behavior are highly correlated. Females were more conservative than males, and older students had more liberal attitudes. Increased knowledge was correlated with more conservative attitudes.
Forslund & Gustafson (1970)	Gender, alcohol use, peer influence, parental influence.	Strongest influence on drinking was peer pressure. Mothers' drinking influenced sons' and daughters' drinking, fathers' drinking influenced only daughters' drinking.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part II *Continued*

Study	Variables	Results
Grimes & Swisher (1988)	Age, gender, substance use, self-concept, alternative activities, role models.	Non-users were characterized as having good information about consequences of drug use, self-confident, involved in other activities, good adult role models, and strong school policies to discourage use.
Johnston, O'Malley & Bachman (1987) (1988). And O'Malley, Bachman & Johnston (1984)	Gender, current levels of use, trends for 1975-85, trends for 1976-82.	Nearly all illicit drugs have shown a decline in usage over last five years except cocaine. Little differences between male and female usage and trends.
Kandel (1975). And Kandel & Faust (1975)	Drug use, progression of use.	Identified at least four stages of drug involvement: 1) beer or wine, 2) cigarettes or hard liquor, 3) marijuana, and 4) other illicit drugs.
Kandel & Logan (1985)	Gender, patterns of initiation, continued use, decline in drug use.	Period of risk for initiation is completed by age 20-21, marijuana and alcohol use start declining at age 20-21, tobacco use increases, men initiate all drugs at higher rates than women except prescribed psychoactives.
Kulbock, Earls & Montgomery (1988)	Health habits, risk behaviors, individual and group social activities.	Substance use defined as prominent adolescent problem-risk behavior.
Maddahian, Newcomb & Bentler (1988)	Gender, ethnicity, drug use, intention to use.	No significant differences between sexes for all ethnic groups on the intention and use variable. Significant differences existed between ethnic groups on use and intention to use.
Marguiles, Kessler & Kandel (1977)	Gender, onset of drinking, peer influence, parental influence, adolescent values and lifestyles.	Parental models for drinking, friends who drink, deviant behavior, increased levels of social activity, and use of other substances are all predictors of alcohol use.
Marston, Jacobs, Singer, Widaman & Little (1988)	Physical health, mental health, academic achievement, parental use.	Invulnerable teenagers claim better health, social relationships and a happier state of mind than do users. Lower incidence of same problems in parents of non-users.
Moskowitiz & Jones (1988)	Prevalence of student usage, time and location of use.	Prevalence of schools with serious drug problems had declined from 1980 to 1985. Student drug use is more problematic than alcohol use before and during school, both alcohol and drug use are problematic after school. Alcohol use is a large problem at extracurricular activities.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part II *Continued*

Study	Variables	Results
Mott & Haurin (1988)	Gender, age, ethnicity, sexual activity, substance use, initiation of sexual activities and drug use.	Among those under 16, two-thirds of the girls and half of the boys have not been involved with substances or sexual intercourse. Teens who use drugs at an early age are more likely to be sexually active within a year.
Murray, Roche, Goldman & Whitbeck (1988)	Age, gender, ethnicity, family structure, smoking, drinking and marijuana use.	Smokeless tobacco use was more common in males, particularly whites; among whites relative to blacks; among adolescents from one-parent households; and among those who reported current or prior use of cigarettes, alcohol or marijuana. Smokeless tobacco use was also common among Hispanics and Native Americans.
Oetting & Beauvais (1981)	Gender, grade, drug use types, drug use.	Indian adolescents have a higher level of exposure to every drug measured in the study. Smoking is positively correlated with other drugs.
Palmore & Shannon (1988)	Ethnicity, school attendance, family relationships, family violence, substance use, relationship with infant's father.	40% had used drugs prior to pregnancy. 60% of the fathers of the unborn baby reported substance abuse, 54% of the aduit male figures and 21% of the adult female figures in the pregnant adolescent's home reported substance use.
Paton & Kandel (1978)	Gender, ethnicity, substance use, depressive mood, normlessness, social isolation, self-esteem.	Depressive mood and normlessness have a moderate positive relationship to drug use; this varies by ethnicity and sex, stronger in girls and amongst whites.
Potvin & Lee (1980)	Age, frequency of substance use, parental support-affection, parental approval of friends, peer conformity, self-esteem, alienation, religiosity.	Conformity-commitment influences by family and peers, and religiosity affect alcohol and drug use with some age variances.
Prendergrast & Schaefer (1974)	Drinking and drunkenness indices, parent behaviors, parent's approval of adolescent behaviors.	Parents' attitudes and behavior toward the youth, especially maternal control, correlated more strongly with child's drinking behavior than did either the parents' drinking behavior or attitudes toward drinking.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part II *Continued*

Study	Variables	Results
Reynolds & Rob (1988)	Age, gender, depression, substance use, sexual activity, school performance, family closeness, parental love.	Prevalence of unhealthy and acting-out behavior increased with age then leveled out. The quality of family relationship was associated with presence or absence of adolescent acting-out behaviors and depression.
Riggs & Chen (1988)	Health problems, willingness to use clinic.	Respondents who used substances were no more willing than non-substance using peers to use the clinical for relevant health information.
Rundall & Bruvold (1988)	Behavioral changes, attitude changes, knowledge changes.	Smoking and alcohol interventions have modest effect on immediate behavior changes. Smoking interventions had better long-term effect than alcohol programs. All programs increase knowledge. "Awareness" programs are ineffective as compared to other programs.
Schwartz, Hoffman & Jones (1987)	Family problems, behavioral problems academic problems, delays in diagnosis.	Family harmony, school attendance and school achievement deteriorated with increased marijuana use. Many deviant behaviors noted. A mean time of 12 months elapsed from onset of use to parents' suspicion of use.
Smith, Schwartz & Martin (1989)	Cocaine use, side effects.	21% started use at age 14. Users report running away, school drop-out and delinquent behaviors. Majority were polydrug users.
Smith, Canter & Robin (1989)	Demographics, socialization, expectancies, social skills, parental influence, peer influence, family cohesion and communication, peer approval and modeling, parental approval, behavioral problems, religious activity, alcohol use.	Path model supports powerful path through to drinking may begin with family interaction problems and lead to reduction in adolescent's coping skills. This leads to compensatory belief that alcohol improves mental and physical functions and increased affiliation and acceptance with peer group who supports increased usage.
Swisher (1988)	Alcohol use, drinking and driving practices, passenger practices.	Risky driving and riding practices are prevalent and are a part of a large cluster of negative behaviors.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part II *Continued*

Study	Variables	Results
Swisher & Bibeau (1987)	Grade, substance use, driving practices behavioral problems.	Alcohol more common than any other substance. Most prefer not to drive home when drunk, but one-third would drive under the influence or with someone who had been drinking.
Swisher & Hu (1983)	Grade, gender, substance use, alternative activities.	Certain activities are associated with use of certain substances.
Swisher, Nesselroade & Tatanish (1985)	Self-reported use, willingness to use, frequency of use.	Experimental group showed decrease in substances used and in amount used.
Swisher, Shute & Bibeau (1984)	Grade, gender, substance use, behavioral intentions, school climate.	Higher grade level, dislike of school and behavioral intention to use are correlated with actual use.
Thorton (1981)	Age, gender, marijuana use, delinquent behaviors, school achievement, social support, parental social control.	Marijuana use is not related to aggressive delinquent behavior but is related to property offenses. Age, sex and school achievement were related to aggressive delinquent acts.
Thompson & Wilsnak (1987)	Age, gender, ethnicity, alcohol use, parental influences, parent-adolescent conflict.	Parent-adolescent conflict highly correlated to usage. Parental modeling affects onset and patterns of drinking especially for girls. Ethnicity affected onset and amount of drinking.
Wechsler & McFadden (1976)	Gender, alcohol use, illicit drug use.	Few consistent gender differences were found in patterns of substance use.
Wechsler & Thum (1973)	Gender, family characteristics substance use, social orientation, delinquent behaviors, peer use.	Heavy alcohol users more frequently used illicit drugs than light or nondrinkers. In high school no difference in male versus female alcohol use. Heavy drinking associated with delinquent behavior, parental alienation and identification with youth culture.
Welte & Barnes (1987)	Gender, ethnicity, alcohol use, heavy drinkers, alcohol-related problems, illicit drug use.	Higher proportions of heavy drinkers and drug users among American Indians. Blacks are low in substance use compared to Hispanics and whites. Oriental males drink more than oriental females. Groups with most drinkers have higher consumption and more drug use.

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EMPIRICAL ELEMENTS OF SUBSTANCE USE STUDIES, Part II *Continued*

Study	Variables	Results
White (1988)	Gender, age, cocaine use, changes in cocaine use, other drug use.	Increase in usage over time was apparent. No gender differences present. Continuous users decreased their use of other drugs.
White & Swisher (1989)	Gender, grade, substance use, behavioral intentions, school climate, peer relations.	Higher usage of substances was correlated with higher grade level, dislike of school, more peer influence, dislike of teachers.
Windle & Barnes (1988)	Gender, alcohol use, reasons for drinking, individual factors, peer influence, school orientation, problem behavior.	Excitement-seeking or pleasurable reasons were highly correlated to use. Gender differences in reasons for use was apparent. Both sexes report high correlations between delinquent behavior and consumption.
Winfree, Theis & Griffiths (1981)	Gender, age, ethnicity, substance use, social support, parental social support, legal criticism.	Gender and age accounted for 12% of variance in marijuana use. Legal criticisms significant for marijuana use but not alcohol. Peer and parental factors significant for marijuana use but not alcohol.
Wolford & Swisher (1986)	Gender, grade, school climate, substance use, behavioral intentions, alternative activities.	As intention to use increased so did actual use. Higher usage reported with higher grade, less alternative activities, dislike of school and disfavorable attitude toward teachers.
Yamaguchi & Kandel (1984a)	Gender, past drug use, current drug use.	Sequence of progression of drugs involves use of at least one legal drug (tobacco or alcohol), to marijuana, and from marijuana to other illicit drugs and/or prescribed psychoactive drugs. Cigarettes more important for women than for men in the progression.
Yamaguchi & Kandel (1984b)	Gender, age, delinquency, depression, patterns of progression of use.	Prior use of marijuana is necessary for progression to other drugs. Depression and delinquency influence psychoactive drug use as well as does other drug use.

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Appendix B

Demographic Survey

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DEMOGRAPHIC SURVEY

1. Your Age: _____ 12 _____ 16
   _____ 13 _____ 17
   _____ 14 _____ 18
   _____ 15 _____ 19

2. Your Ethnic Group:
   _____ White _____ Asian
   _____ Black/Afro-American _____ Filipino
   _____ Pacific Islander _____ Hispanic
   _____ American Indian _____ Other_____

3. Do you and your family live in a: Does your family own or rent (Check One)
   _____ Apartment _____ _____
   _____ Condominium _____ _____
   _____ Single Family Home _____ _____
   _____ Apartment, Condominium or House rented or owned by someone else
   _____ In Transition

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4. What is your fathers occupation?

_____

5. Is your father working at this time?

_____

6. What is your mothers occupation?

_____

7. Is your mother working at this time?

_____

8. How many people live in your home?

_____ Two	_____ Six	_____>10
_____ Three	_____ Seven	
_____ Four	_____ Eight	
_____ Five	_____ Nine	

9. Are your parents:

_____ Married To Each Other

_____ Divorced But Not Remarried

_____ Divorced and Mother Has Remarried

_____ Divorced and Father Has Remarried

_____ Divorced and Both Are Remarried

_____ Separated

_____ Never Married

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10. Which parent(s) do you live with?

_____ Mother

_____ Father

_____ Mother and Stepfather

_____ Father and Stepmother

_____ Mother and Boyfriend

_____ Father and Girlfriend

_____ Neither Father nor Mother (please specify who)_____

Directions: Below is a list of tobacco, alcohol and other drugs. Remember that your answers are confidential and private. Please fill in the circle that comes closest to showing how often you think **your parents** use or have used each one of these things.

	Never Used	Used More Than A Year Ago	A Few Times A Year	About Once or Twice a Month	About Once or Twice a Week	About Once a Day
CIGARETTES	O	O	O	O	O	O
CHEWING TOBACCO, SNUFF	O	O	O	O	O	O
BEER (beer, ale, malt liquor)	O	O	O	O	O	O
WINE (wine, champagne)	O	O	O	O	O	O
COOLERS (wine- or alcohol-based)	O	O	O	O	O	O
LIQUOR (whiskey, vodka, rum, bourbon)	O	O	O	O	O	O
MARIJUANA (grass, pot, hash, weed)	O	O	O	O	O	O
INHALANTS (whippets, rush, sniffing glue)	O	O	O	O	O	O
SEROTONIN (spinners, wagon-wheels)	O	O	O	O	O	O
COCAINE (coke, crack)	O	O	O	O	O	O
HEROIN (smack, skag)	O	O	O	O	O	O
HALLUCINOGENS (acid, LSD, trip, shrooms)	O	O	O	O	O	O
PRESCRIPTION DRUGS WITHOUT DOCTOR'S ORDERS						
UPPERS (speed, meth, crank, diet pills)	O	O	O	O	O	O
DOWNERS (ludes, tranqs, barbs, sedatives)	O	O	O	O	O	O

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Appendix C

Primary Prevention Awareness, Attitude and Usage Scale

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Appendix C, 194-197
Appendix D, 199
Appendix E, 201
Appendix F, 203

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Appendix D

Family Adaptation and Cohesion Scale

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Appendix E

Parent-Adolescent Communication Scale

(Adolescent and Father Form)

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Appendix F

Parent-Adolescent Communication Scale

(Adolescent and Mother Form)

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Appendix G

Psychometric Properties of Measures

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PSYCHOMETRIC PROPERTIES OF MEASURES

Variables	Measures	Items	Reference	Reliability	Validity
Adaptation	FACES III	10	Olson, et al, 1985	Internal Consistency r = .62	Face = Very Good
				Test-retest = .80	Content = Very Good
Cohesion	FACES III	10	Olson, et al, 1985	Internal Consistency r = .77	Correlation Between Scales r = .03
				Test-retest = .83	Concurrent = Lack of Evidence
					Discrimination Between Groups = Very Good
Open Communication	PACS	10	Barnes & Olson, 1985	Internal Consistency r = .87	Face = Very Good
				Test-retest r = .78	Construct r = .26-.71
Problem Communication	PACS	10	Barnes & Olson, 1985	Internal Consistency r = .78	
				Test-retest r = .77	
Intention to Use Substances	PPAAUS	13	Swisher & Bibeau, 1987	Internal Consistency r = .76-.83	Face = Very Good
Reported Sugstance Use	PPAAUS	13	Swisher & Bibeau, 1987	Internal Consistency r = .83-.90	Content = Very Good
					Correlation Between Scales r = .90

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Appendix I

Consent Letter From the School District

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December 20, 1989

University of San Diego
Philip Y. Hahn School of Nursing
San Diego, CA

To Whom It May Concern:

As the Administrator of Student Services in the School District, I do hereby grant permission for Vicky R. Bowden to complete her dissertation research survey, "The Relationship Between Adolescent's Perception of Family Functioning and Reported Use of Alcohol, Tobacco Products, and Illicit Drugs," in the School District.

The administration of High School has agreed for her to survey students at High School during the month of January, 1990.

Sincerely.

Administrator, Student Services

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Appendix J

Introductory Letter

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Vicky R. Bowden R.N., MNSc, Investigator
Doctor of Nursing Science Candidate
University of San Diego

January, 1990

Dear Student,

My name is Vicky Bowden, and like you I am also a student. I am working on my doctorate degree in Nursing from the University of San Diego. As a part of my work as a student I am carrying out a research project. The purpose of this project is look at what adolescents think about their families and how this relates to certain health risk behaviors of high school students and their parents.

You, and several other students from your high school have been selected from all the students at your school to participate in this research study. At this point I do not know anything about your family. Nor do I know anything about your health risk behaviors or those of any of your family members. You were chosen to be in this study only on the basis of your being a high school student.

I have been given approval to conduct this research study by _____, the Assistant Superintendent of the _____ School District and by _____, the principal at your high school. Your participation is voluntary and even if you agree to participate, you can withdraw from the study at any time.

Let me tell you what would be involved if you agree to participate. First of all, you need to have your parents read this letter, then both you and one parent must sign the attached consent form. You need to bring the signed consent form with you to your Health and Safety class on one of the next four days (Tuesday-January 23, Wednesday-January 24, Thursday-January 25 or Friday-January 26). You can give the signed consent form to your teacher.

On Friday, January 26th, if you have brought back your signed consent form on that day or on another day during the week, you will be greeted by myself and a research assistant in your Health and Safety class. We will be happy to answer any questions you may have at this time. You will then be asked to complete four **short** paper and pencil questionnaires. It should take 45-60 minutes to complete all of these questionnaires. You will be able to complete the questionnaires during the class period. Your teacher will be present to take class roll, so even if you decide not to participate you do need to plan to come to class that day. If you do decide to participate your teacher will be giving you extra class credit to compensate for your time and efforts.

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It is important for you to know that your participation in this study is confidential. Your name will never appear on any of the questionnaires. No one will ever know how you specifically answered the questions. Neither your parents, teachers, or friends can ever see the answers you wrote on the questionnaire.

When you have completed the questionnaires, we will again answer any questions you may have. I will ask you not to talk about the questions you answered for one day. This is so that other students who may be participating won't be influenced by anyone else as they answer the research questions.

I hope you will thoughtfully consider participating in this research study. I, and many others like myself are very interested in families and the influence families have upon our actions and behaviors. By trying to learn more about families I believe we can better understand how you as an adolescent feel and what you need as you learn and grow during this period of your life.

Thank you for taking the time to read this letter. Please show it to at least one of your parents, and please do consider participating. I hope to see you in the next three days as you come to complete the questionnaires.

Sincerely,

Vicky R. Bowden RN, MNSc
Doctoral Student
University of San Diego

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Appendix K

Consent to Participate

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Consent To Participate

Vicky R. Bowden R.N., MNSc, Investigator
Doctor of Nursing Science Candidate
University of San Diego
(714) 937-7676 - Day

Purpose of the Study

Ms. Vicky R. Bowden R.N., a doctoral student at the University of San Diego, is conducting a research study to look at how adolescent's view their families and how this relates to adolescent's health behaviors. This study will help us better understand what adolescents think about their families and if the way the family functions is related to particular adolescent or parental health risk behaviors.

Participating in the Study

I, as a high school student in the _____ School District, have been randomly chosen to participate in this study. At this point, the researcher knows nothing about me or my family. Permission to conduct this study has been granted by _____, the Assistant Superintendent of the _____ School District, and by _____, the principal at my school.

I understand that by signing this consent form my parent and I are granting permission for me to participate in this study.

I understand that participation in this study is voluntary, and that I may withdraw from the study at any time. If I wish to participate in this study I need to return this consent form within the next four days (Tuesday-January 23, Wednesday-January 24, Thursday-January 25, or Friday January 26) to the teacher of my Health and Safety class.

I understand that on Friday, January 26th, if I have returned the signed consent form I will be asked to complete four short self-report questionnaires which ask questions about me and my family. Completing the questionnaires will take 45 to 60 minutes. Prior to and following the completion of the questionnaires I am free to ask the researcher any questions about the procedure. In addition, my parents may contact the researcher at the phone number listed above should they have any questions about the research study.

Risks/Benefits

I realize that participating in this study may make me think a bit more about the relationships in my family, both

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positive and negative. I understand that if I wish to discuss these thoughts with someone else, there are school counselors available to listen to my thoughts.

When I complete the instruments I will receive extra credit in my Health and Safety class for participating in this study.

Confidentiality

I understand that neither my name nor my parent's names will appear on any of these questionnaires. Furthermore all information concerning my participation in this study and the responses I give on the questionnaires are confidential and will be kept in a locked file cabinet. In addition, my identity or that of my family will not be revealed when the study is published, as only group data will be reported.

I, the undersigned, understand the above explanations and, on that basis, I give consent to my voluntary participation in this research.

_____
Name of the Adolescent (Please Print)

_____ Date:_____
Signature of the Adolescent

_____
Name of the Parent or Guardian (Please Print)

_____ Date: _____

Signature of the Parent or Guardian

_____ Date: _____
Location

_____ Date: _____
Signature of the Principal Investigator

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Appendix L

Canonical Correlation Model One:

Dimension Reduction Analysis

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Appendix L

Model One Canonical Correlation: Dimension Reduction Analysis

Roots	Wilks' L.	F	Hypoth df	Error df	Sig. of F
1 to 2	.781	6.042	12.00	552.00	.000
2 to 2	.958	2.439	5.00	277.00	.035

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Appendix M

Canonical Correlation Model One:

Eigenvalues and Canonical Correlations

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Appendix M

Model One Canonical Correlation: Eigenvalues and Canonical Correlations

	Eigenvalue	Pct.	Cum. Pct.	Canon Cor.	Sq. Cor.
Root No. 1	.226	83.694	83.694	.429	.184
Root No. 2	.044	16.306	100.000	.205	.042

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Appendix N

Canonical Correlation Model Two:

The First Canonical Variate Set and Correlation

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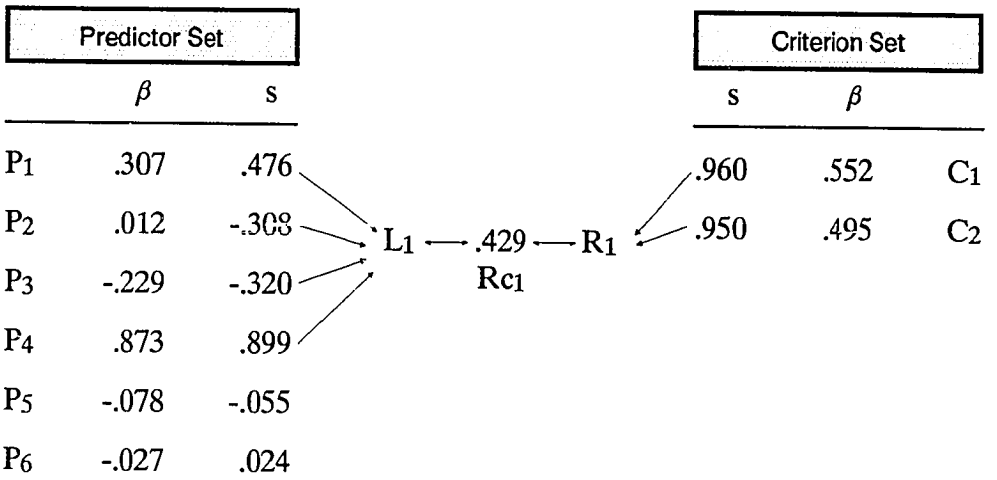
Appendix N

Model One: The First Canonical Variate Set and Correlation



P1 = Family Adaptation and Cohesion

P2 = Father-Adolescent Communication

P3 = Mother-Adolescent Communication

P4 = Parental Substance Use

P5 = Adolescent Age

P6 = Adolescent Gender

C1 = Adolescent Behavioral Intention to Use Substances

C2 = Adolescent Self-Reported Use of Substances

Note:
β = standardized canonical weights
s = structure coefficients
Rc = canonical correlation

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Appendix O

Canonical Correlation Model Two:

Dimension Reduction Analysis

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Appendix O

Model Two Canonical Correlation: Dimension Reduction

Roots	Wilks' L.	F	Hypoth df	Error df	Sig. of F
1 to 6	.598	3.063	48.00	1332.58	.000
2 to 6	.766	2.138	35.00	1142.42	.000
3 to 6	.883	1.442	24.00	950.10	.078
4 to 6	.951	.917	15.00	754.03	.545
5 to 6	.987	.451	8.00	548.00	.890
6 to 6	.997	.267	3.00	275.00	.849

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Appendix P

Canonical Correlation Model Two:

Eigenvalues and Canonical Correlations

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Appendix P

Model Two Canonical Correlation: Eigenvalues and Canonical Correlations

	Eigenvalue	Pct.	Cum. Pct.	Canon Cor.	Sq. Cor.
Root No. 1	.282	50.044	50.044	.469	.220
Root No. 2	.153	27.127	77.170	.364	.132
Root No. 3	.078	13.830	91.001	.269	.072
Root No. 4	.037	6.655	97.656	.190	.036
Root No. 5	.010	1.826	99.482	.101	.010
Root No. 6	.003	.518	100.000	.054	.003

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Appendix Q

Model Two: The First Canonical Variate Set and Correlation

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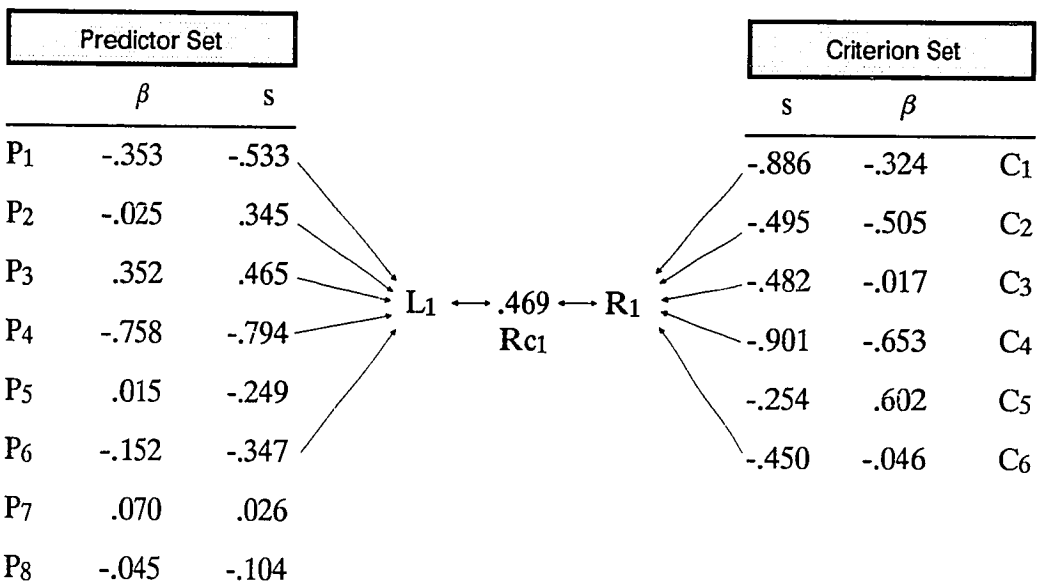
Model Two: The First Canonical Variate Set and Correlation



P1 = Family Adaptation and Cohesion
P2 = Father-Adolescent Communication
P3 = Mother-Adolescent Communication
P4 = Parental Use of Alcohol
P5 = Parental Use of Tobacco Products
P6 = Parental Use of Illicit Drugs
P7 = Adolescent Age
P8 = Adolescent Gender

C1 = Adolescent Behavioral Intention to Use Alcohol
C2 = Adolescent Behavioral Intention to Use Tobacco Products
C3 = Adolescent Behavioral Intention to Use Illicit Drugs
C4 = Adolescent Self-Reported Use of Alcohol
C5 = Adolescent Self-Reported Use of Tobacco Products
C6 = Adolescent Self-Reported Use of Illicit Drugs

Note:
β = standardized canonical weights
s = structure coefficients
Rc = canonical correlation

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Appendix R

Model Two: The Second Canonical Variate Set and Correlation

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Appendix R

Model Two: The Second Canonical Variate Set and Correlation

Predictor Set				Criterion Set		
	β	s		s	β	
P_1	-.072	-.067		.098	-.260	C_1
P_2	.109	.127		.744	.013	C_2
P_3	.082	.167		.318	.129	C_3
P_4	-.198	.075	$L_1 \longleftrightarrow .364 \longleftrightarrow R_1$	.224	-.033	C_4
P_5	.929	.918	R_{C2}	.950	1.093	C_5
P_6	.186	.374		.296	-.193	C_6
P_7	.054	.143				
P_8	-.217	-.245				

P_1 = Family Adaptation and Cohesion

P_2 = Father-Adolescent Communication

P_3 = Mother-Adolescent Communication

P_4 = Parental Use of Alcohol

P_5 = Parental Use of Tobacco Products

P_6 = Parental Use of Illicit Drugs

P_7 = Adolescent Age

P_8 = Adolescent Gender

C_1 = Adolescent Behavioral Intention to Use Alcohol

C_2 = Adolescent Behavioral Intention to Use Tobacco Products

C_3 = Adolescent Behavioral Intention to Use Illicit Drugs

C_4 = Adolescent Self-Reported Use of Alcohol

C_5 = Adolescent Self-Reported Use of Tobacco Products

C_6 = Adolescent Self-Reported Use of Illicit Drugs

Note:
β = standardized canonical weights
s = structure coefficients
R_C = canonical correlation

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